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**Bridging Gaps in the  
Implementation of  
Economic and Industrial  
Development Strategies in  
Pakistan**

پاکستان میں اقتصادی  
اور صنعتی ترقی کے عمل  
میں حائل رکاوٹوں کا خاتمہ

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The focus on public policy further underscores the journal's commitment to making a tangible impact on national and international issues. By providing a space for research and analysis, the journal helps to inform policymakers and practitioners, who can then use this information to develop more effective policies and programs. Additionally, the focus on viable solutions emphasizes the importance of actionable recommendations that can be implemented in the real world.

Overall, the journal's focus on research, analysis, and practical solutions reflects a commitment to advancing knowledge and making a positive impact in the fields of international relations, Pakistan affairs, and faith & society. By providing a platform for diverse perspectives and experiences, the journal contributes to a more comprehensive understanding of complex issues and the development of effective policies and programs.

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# Khyber Journal of Public Policy

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## Special Issue: Bridging Gaps in the Implementation of Economic and Industrial Development Strategies in Pakistan

(This special issue consists of the proceedings of a 2-Day Public Seminar held on January 20-21, 2025, conducted at the conclusion of the Public Policy Simulation Exercise during the 42<sup>nd</sup> Mid Career Management Course.)

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## **Message of the Capt. (Retd) Usman Gul,**

*Director General National Institute of Public Administration, Peshawar  
on the eve of Special Issue of the Khyber Journal of Public Policy:*

It is with immense pride that I present this special issue of the Khyber Journal of Public Policy (KJPP), highlighting critical research contributions aimed at advancing Pakistan's industrial development. This issue reflects the National Institute of Public Administration's dedication to fostering evidence-based research and policy innovation for sustainable growth.

The topics explored in this edition address pivotal aspects of industrial policy, ranging from the evaluation of Special Economic Zones (SEZs) under CPEC to mechanizing agriculture for higher yields and crop diversification. Research on labor policies, technical and vocational education and training (TVET), and high-tech industries highlights the importance of aligning Pakistan's industrial strategies with global advancements and local needs.

Sectoral analyses of the textile, automobile, and export industries, alongside evaluations of energy policies and their industrial impact, underscore the multifaceted challenges and opportunities in Pakistan's developmental journey. These papers not only identify gaps in current policies but also offer actionable recommendations to enhance industrial efficiency, innovation, and sustainability.

I commend the authors and researchers for their meticulous work and dedication. This special issue is a testament to their collective expertise, serving as a valuable resource for policymakers, academicians, and practitioners. It also reinforces our mission to contribute meaningfully to Pakistan's socio-economic progress.

Let this publication inspire informed decision-making, foster collaboration, and guide efforts to achieve a robust, inclusive, and resilient industrial framework.

Congratulations to all on this exceptional achievement.

***Capt. (Retd) Usman Gul,***  
Director General  
National Institute of Public  
Administration, Peshawar





## **Preface**

*of the Special Issue of Khyber Journal of Public Policy*

It gives us immense pleasure to present this Special Issue of the Khyber Journal of Public Policy, published by the National Institute of Public Administration (NIPA), Peshawar – a constituent unit of the National School of Public Policy. This edition is a comprehensive exploration of Pakistan's evolving climate policies, particularly focusing on Khyber Pakhtunkhwa (KP), in the context of national and international obligations. The journal serves as a platform for insightful analysis, critical evaluations, and innovative solutions to the contemporary challenges faced by various sectors of our society. In this volume, we have brought together a series of thought-provoking articles that cover a range of industrial and socio-economic issues critical to the development of Pakistan.

This issue of the journal delves deeply into industrial policy-making at both the national and regional levels. Contributions such as "Evaluation of SEZs Policies, Implications, and Its Impact on Industrialization in KP Under CPEC" provide a comprehensive review of the role of Special Economic Zones (SEZs) in driving industrial growth within Khyber Pakhtunkhwa, particularly within the context of the China-Pakistan Economic Corridor (CPEC). Alongside this, the critical evaluation of Technical and Vocational Education and Training (TVET) policies underscores the necessity of aligning education and training systems with industry demands to address employment gaps and improve skill development.

Moreover, the journal explores other vital sectors, such as agriculture, transportation, labor welfare, and energy, evaluating their policies and practices in relation to industrial development. "Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, and Precision Agriculture" reflects on the potential for technological innovations in agriculture to contribute to sustainable growth, while discussions on the Automobile and Transportation Industry offer a comprehensive view of the challenges and opportunities for industrial development in these key areas.

The journal also addresses emerging industries, particularly in high-tech and smart agriculture, evaluating Pakistan's readiness to adapt to new technologies and global trends like China's reverse engineering strategies. Additionally, it touches on the textile industry, export sector, and energy policies, all of which are essential for understanding Pakistan's industrial landscape and formulating appropriate policy interventions for long-term growth.

As you engage with these articles, we hope that this volume of the Khyber Journal of Public Policy will inspire deeper reflection and dialogue on policy solutions that can drive meaningful progress in Pakistan's industrial and socio-economic sectors. The insights presented in this journal are the result of rigorous research and thoughtful analysis, reflecting the commitment of the contributors to fostering a robust policy framework for Pakistan's future.

We extend our gratitude to the authors, reviewers, and the entire editorial team for their tireless efforts in producing this issue. It is through such collaborative work that we continue to strive for impactful policy solutions that benefit both our local communities and the nation as a whole.

Dr. Muqem ul Islam  
*PhD (Public Policy & Governance)*  
Editor,  
Khyber Journal of Public Policy

# Critical Analysis of The Recent Legislation and Initiatives to Curb Fake News and Disinformation in Pakistan: Challenges and Way Forward

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## Abstract:

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In the post-truth era, fake news and disinformation have emerged as critical challenges, influencing political, social, and economic landscapes. In Pakistan, the rapid spread of fake news through social media has led to social polarization, security risks, and political instability. While the government has enacted laws such as the Prevention of Electronic Crimes Act (PECA) 2016 and introduced regulatory measures to curb misinformation, these efforts face criticism for political bias and excessive control. The study analyzes recent legislative measures and government strategies, identifying legal loopholes and the need for balanced regulatory frameworks. It highlights the importance of fact-checking initiatives, digital literacy programs, and the role of independent media bodies in countering disinformation. The findings suggest that Pakistan must adopt transparent, consensus-based policies to effectively tackle fake news without undermining freedom of expression. A comprehensive approach, including AI-driven fact-checking and international collaboration, is crucial to combating disinformation.

## Key words:

Fake News, Disinformation, Social Media Regulation, Freedom of Expression, Cyber Laws

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## *Introduction*

We are living in a post truth era where the value of truth has become less relevant from social and political perspective. Fake News is described as purposefully crafted, sensational, emotionally charged, misleading or totally fabricated information that mimics the form of mainstream news (McLeod, 2020). Disinformation is fake news that is created and spread deliberately – by someone who knows fully well that it’s false (BBC, n.d.). Misinformation, however, is a news that is conceived and propagated unintentionally or inadvertently by someone without realizing that it is fake and will have consequences. Fake news as a type of online disinformation with misleading and/or false statements that may or may not be associated with real events, intentionally designed to mislead and/or manipulate a specific or imagined public through the appearance of a news format with an opportunistic structure (title, image, content) to attract the reader’s attention in order to obtain more clicks and shares and, therefore, greater advertising revenue and/or ideological gain (Baptista, 2022). The entire world is facing the problem of fake news or disinformation. The countries allege each other to use fake news or disinformation as tool to meddle in the election process and influence election results.

Pakistan, in recent years, has witnessed a rising trend of fake news and disinformation regarding social, political, security, religious, electoral and economic matters through social media and online channels. And this phenomenon has serious repercussions for social cohesion, national security and political landscape. Though Article 19 of the Constitution of the Islamic Republic of Pakistan recognizes freedom of opinion, expression and speech as fundamental right of every citizen of Pakistan and it also guarantees freedom of press, nevertheless, such freedom is to be exercised subject to reasonable restrictions in the interest of glory of Islam, integrity, security or defence of Pakistan, friendly relations with foreign States, public order, decency and incitement to an offence (The Constitution of Islamic Republic of Pakistan, 1973). Earlier, the sources of news or information were limited, so, the government, in order to regulate, used Ministry of Information and Broadcasting and Pakistan Electronic Media Regulatory Authority. Moreover, the newspapers or electronic media platforms had their editorial boards which acted as internal regulators to keep an oversight on authenticity or credibility of information. However, flow of information through social media or online forums presents a unique challenge to the Government in particular and society in general. In 2016, the then Government legislated the Prevention of Electronic Crimes Act, 2016, and it was amended from time to time, to control fake news or disinformation disseminated through social media platforms. The Pakistan Telecommunication Authority has also been used to remove unlawful content and block social media platforms e.g. blocking YouTube for not removing blasphemous content. In 2020, the then Government, drawing powers from the Pakistan Telecommunication Re-organization Act 1996 and the PECA, 2016, introduced the Citizens Protection (against online harm) rules, 2020, wherein it was made obligatory on the Social Media Companies to register with the Authority, establish their offices in Pakistan and to block accounts involved in fakes news or disinformation. Moreover, EU Disinfo Lab report unveiled India’s involvement in spreading fake news or disinformation in Pakistan (The Express Tribune, 2020).

Despite repeated endeavours of the successive Governments, the fake news or disinformation kept spreading unabated.

### ***Statement of the Problem***

There is no denying the fact that the rampant dissemination of fake news and disinformation, in Pakistan, has augmented social polarization, tarnished image of state institutions, spoiled political culture and contributed in deteriorating law and order situation, however, the federal and provincial governments, have adopted certain strategies and enacted laws to curb fake news or disinformation. It is, therefore, imperative to critically analyse the recent legislations, initiatives and strategies of the federal and provincial governments, in Pakistan, to curb fake news and disinformation, so as to assess the challenges, identify loopholes in the existing legal regime or strategies, if any, and propose the way forward.

### ***Research Questions***

- No.1: What are the important components of the recent legislations, initiatives and strategies of the federal and provincial governments to deal with fake news or disinformation?
- No.2: How effective these legislations, strategies and initiatives have proven or will prove in curbing fake news or disinformation?
- No.3: What can be or have been the impacts, other than handling fake news, of these legislations, initiatives and strategies?
- No.4: Is criminalising fake news or blocking a social media platform an effective and wise strategy?
- No.5: What are the legal frameworks worldwide to deal with fake news or disinformation?

### ***Scope of the Study***

The study primarily focuses on critically analysing the recent regulatory framework to curb fake news or disinformation, which includes: a) Legal Frame Work i.e. the Prevention of Electronic Crimes (Amendment) Act, 2025, the Punjab Defamation Act, 2024 and the PEMRA (Amendment) Act, 2023, and b) the Institutional Frame Work. In addition to this, in order to eliminate fake news or disinformation, the government's recent strategies of installation of firewall and blocking access to social media platforms will also be analysed.

### ***Research Methodology***

This study is qualitative in nature. For the purpose of this study, data has been collected from secondary sources i.e. news articles, journals, reports, laws etc. Thereafter, the data has been analyzed using research tools such as Situational Analysis, Legal Analysis, PESTLE Analysis and Policy Gap Analysis.

## *Literature Review*

For the purpose of this study following literature has been reviewed;

- i. The Prevention of Electronic Crimes (Amendment) Act, 2025
- ii. The Punjab Defamation Act, 2024
- iii. The Defamation Ordinance, 2002
- iv. The PEMRA (Amendment) Act, 2023
- v. The Pakistan Telecommunication Re-organization Act, 1996 as amended from time to time
- vi. Trial Watch Fairness Report- A Clooney Foundation for Justice Initiative
- vii. Chilling Legislation: Tracking the Impact of “Fake News” Laws on Press Freedom Internationally by Gabrielle Lim and Samantha Bradshaw
- viii. Review a Working Definition of Fake News João Pedro Baptista and Anabela Gradim
- ix. Pakistan Electronic Media Regulatory Authority’s Report 2021-23
- x. Countering disinformation in Pakistan-Lessons and recommendations for digital media
- xi. Safe Use of Social Media - Online Safety Guide by Pakistan Telecommunication Authority
- xii. Establishment Division’s OM dated 2nd of September, 2024 providing updated guidance for the usage of Social Media Platforms by the Government Servants
- xiii. Removal and Blocking of Unlawful Online Content (procedure, oversight and safeguards) rules, 2021
- xv. Case Laws

## *Dimensions of the Issue*

The study primarily deals with the regulatory and institutional dimensions of the Issue. It highlights the legal regime at the federal and provincial level to curb fake news or disinformation. Thereafter, it unfolds the effectiveness of the legal regime. It critically evaluates the strengths and weaknesses of the institutions responsible for dealing with the fake news or disinformation. The study also explores as whether fake news or disinformation shall be dealt as a civil wrong or criminal act. The aspect of political economy in deciding the strategies to deal with fake news or disinformation has also been discussed.

## *Dimensions of the Analysis*

### *Political Dimension*

The fake news or disinformation is a national problem, however, the response to this problem has never been consensus oriented. Each political party comes up with its own strategy to deal with it. During, the PTI led government, when legislative measures were taken to curb fake news or disinformation, same were criticized by the then opposition. Similarly, the present opposition is criticizing the Prevention of Electronic Crimes (Amendment) Act, 2025 and the Punjab Defamation Act, 2024. The consensus is not built among different stakeholders at the time of policy making.

Such strategies and legislations are not properly debated in the Parliaments or provincial assemblies and are hurriedly passed. Consequently, the implementation becomes difficult. Currently, the media organizations and opposition are agitating on the Prevention of Electronic Crimes (Amendment) Act, 2025. Furthermore, there is a tendency in the political governments to silence their critics or opponents using such measures in the garb of tackling fake news or disinformation. The journalists are genuinely apprehensive that the recent legislation will be used to target them.

### *Administrative Dimensions*

On the administrative side, the enforcement of the Prevention of Electronic Crimes (Amendment) Act, 2025 will face challenges. For instance, the Social Media Protection and Regulatory Authority has been tasked to enlist the Social Media Platforms. How will that Authority achieve this goal remains unexplained? The Social Media Protection and Regulatory Authority has been given powers to issue directions to the Social Media Platforms, however, how will it enforce the directions remains unaddressed. Pakistan is already facing financial crunch and the government has launched campaign to reduce the number of authorities and organizations through the Rightsizing Committee, however, through the latest legislation four new forums have been carved out to curb fake news or disinformation. How will these forums be funded remain unexplained?

### *Social Dimensions*

The fake news or disinformation has polarized the society. In order to keep the social cohesion intact, it is important to curb fake news or disinformation. However, the strategies or initiatives to deal with fake news or disinformation shall not have negative impacts on the societal progress or growth. For instance, blocking access of public to any social media platform is against their fundamental rights and it stops their avenue to information. Similarly, using the tactic of slowing down internet is also detrimental because livelihood of huge number of people is dependent on working online. Moreover, the measures to control flow of information creates a hatred against the government. The best way is to educate the society about how to differentiate between fake news and authentic news.

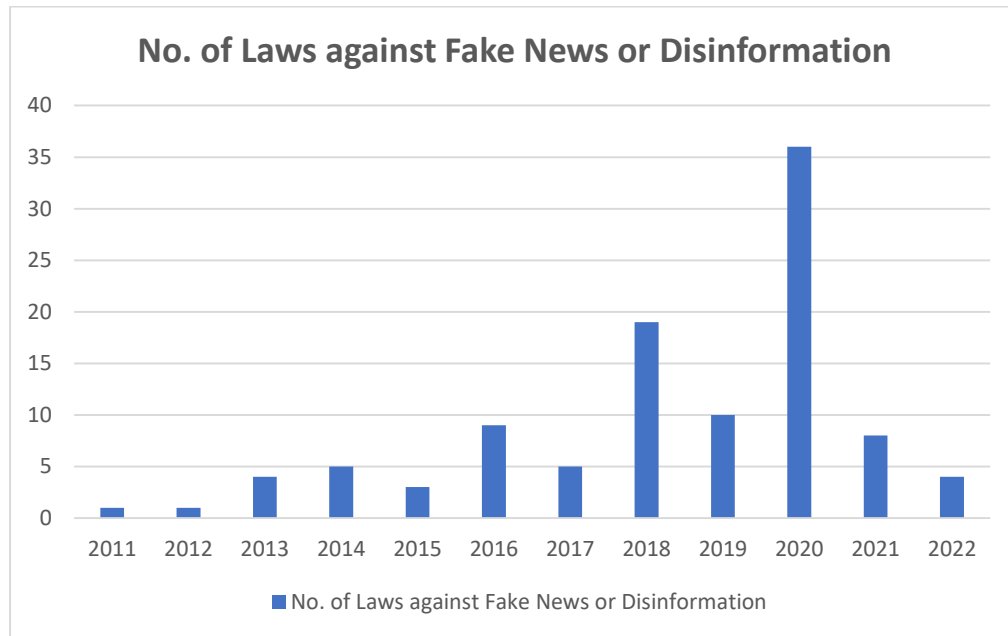
### *Economic Dimensions*

Creating new forums such Social Media Protection and Regulatory Authority, Social Media Complaint Council, Social Media Protection Tribunal and National Cyber Crime Investigation Agency will require more financial and human resources. Thereafter, money will be required for the training and capacity building of the human resource. In addition to this, the other measures to curb fake news or disinformation are having detrimental impacts on the overall economy of the country.

## *Analysis of International Landscape - Strategies to curb misinformation, disinformation & fake news*

Around the world, people have been inundated with false, misleading, and deceptive information about health, politics, and science. Since, 2011, particularly during Covid-19 endemic, around 78 countries have legislated laws to control fake news,

disinformation or misinformation with some focusing on improving platform transparency and media literacy, while, an overwhelming majority has criminalised the creation and dissemination of fake news. An analysis of 105 laws, enacted from 2011 to 2022, unfold four types of legal penalties; excessive monetary fines, imprisonment, content control & correction and administrative regulations such as licensing, data localization and mandated press or media councils. (Bradshaw, 2023).



### *Pecuniary Penalties*

Most of the laws enacted by the governments, worldwide, contain fines or pecuniary penalties for individuals, media organizations and social media platforms held responsible for creation and dissemination of fake news or disinformation. In, 2018, the government of France legislated *La Lutte Contre la Manipulation de l'Information* (The Fight Against Information Manipulation) law. As per this legislation, an individual or organization charged for spreading disinformation or fake news would be fined to the tune of €75,000. In Ethiopia, a law got enacted to curtail hate speech and disinformation, the Prevention and Suppression Proclamation no. 1185 / 2020 under which a fine to the tune of 100,000 birr could be imposed if an individual or entity, having more than 5000 followers, was found involved in spreading fake news or disinformation.

### *Analysis*

Though the laws can limit the spread of fake news or disinformation but they give powers to the Government to silence media or social media platforms. Such laws can be effective if there is an appellate forum provided in law wherein the individual or organization can challenge the orders of the government.

### *Criminalization, Arrests and Imprisonments*

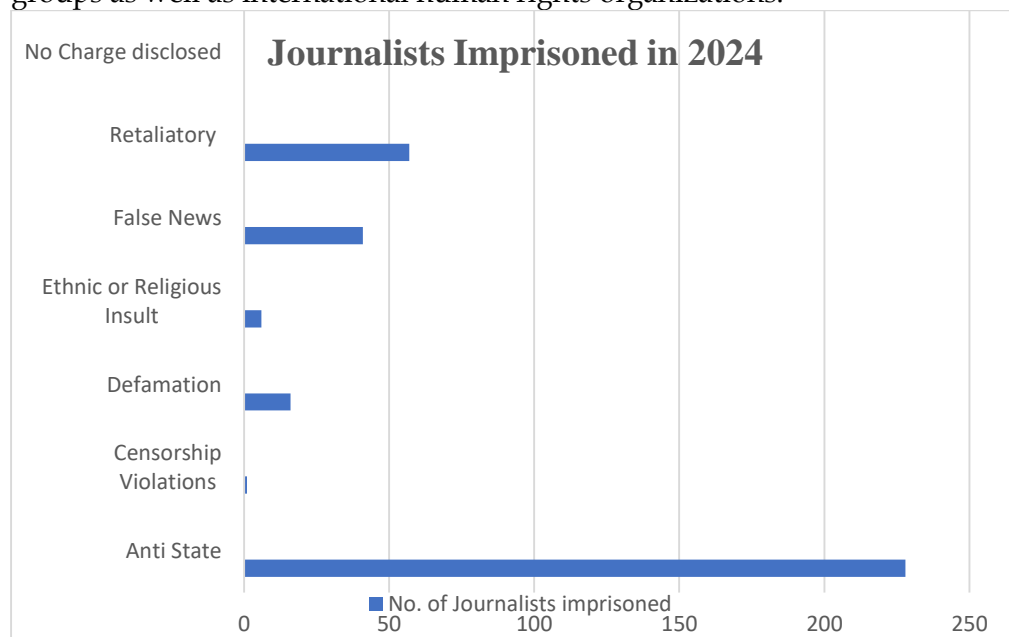
Second form of laws are those which prescribe imprisonment or incarceration for creation or dissemination of fake news or disinformation. The government of Cambodia issued a Joint Directive, in 2018, wherein an individual or organization proven to spread fake news or disinformation could face imprisonment up to 2 years.



During Ukraine war, the Russian government enacted laws criminalising spread of content against Russian military and embassies. So much so that the countries ranking high on the democracy index have passed such legislations e.g. in 2019, Denmark introduced amendment to Penal Code whereby anyone involved in dissemination of fake news or disinformation that helped foreign state actors to influence public opinion, could face sentence up to twelve years. In 2018, Egyptian government incarcerated nineteen (19) journalists, Cameroon government arrested four (4) journalists, Rwanda government arrested three (3) while China and Morocco arrested one (1) each (Journalists, 2018). From 2011 to 2015, twenty-two (22) journalists were sentenced under such laws while from 2016 to 2022 the number of imprisonments swelled to 225 (Journalists, 2022). In 2024, journalists sentenced include a total of fifty-four (54) serving more than ten (10) years; fifty-five (55) between five (5) and ten (10) years, and sixty-two (62) between one (1) and five (5) years (Journalists, 2025).

### *Analysis*

Though these laws create deterrence against the dissemination of fake news but they, firstly, empower authoritarian regimes to punish their critics, thus, muzzling the voices of dissent. Secondly, such laws lead to self-censorship as the journalists or individuals or organizations, under fear of imprisonment, avoid doing criticism and even stay away from sharing correct news or information. Thirdly, the governments receive criticism from digital rights groups as well as international human rights organizations.



### **Committee to Protect Journalists Report**

### *Content Removal & Corrections*

The third type of laws are the ones which require the individuals, organizations or social media platforms to remove or correct the content which is deemed to be fake or can lead to disinformation. Egypt's 2018 law on the Organization of Press stipulates that the broadcast can be banned or suspended if found involved in spread of fake news. Tanzania's Electronic and Postal Communication (online content) regulations prevent online service providers from releasing prohibited content.

Singapore's 2019 protection from online falsehoods and manipulation act, 2019 made it obligatory on the publisher or the individual or social media platform to correct the content in case it was found fake.

#### *Analysis*

In these laws, the definition of the content is deliberately kept vague so that any content which the governments or authorities consider against their interest can be removed easily.

#### *Administrative Regulations*

The fourth set of laws contain licensing regime, transparency requirements, localization of data, setting up councils or maintaining press registry to control fake news or disinformation. Belarus's amendment in the Media Laws, in order to address the issue of fake news, compelled organizations to register with the government. The authors of the posts as well as those who comment shall give their correct identity. Vietnam's Cyber Security Law requires that foreign and domestic platforms set up offices and store data locally.

#### *Analysis*

These laws increase government surveillance. The localization of data can end up being an easy tool for the government to access it, thus, compromising data privacy. With or without warrants, the official agencies can access the data from the offices.

### *Policy GAP Analysis*

In Pakistan, fake news or disinformation have grave consequences for national security and societal cohesion. In order to curb fake news or disinformation, the incumbent government introduced the Prevention of Electronic Crimes (Amendment) Bill, 2025, which after approval of the both houses of the Parliament and assent of the President became an Act of the Parliament on January 29<sup>th</sup>, 2025. Prior to this Act, the incumbent government adopted for the strategies or initiatives such as installation of firewall and banning of social media platforms e.g. Twitter or X to curb fake news or disinformation. The Punjab government, in May, 2024, introduced the Defamation Act, 2024 to impose penalty on defaming someone by hurling false allegations or propagating fake news or disinformation through social media platforms or any other mode of communication. However, strategies such as public awareness, training of journalists, fact checking initiatives, increasing digital literacy, use of modern tools and artificial intelligence to counter fake news or disinformation have never been priority of any government. The present legal regime and initiatives have certain defects due to which the political government is facing criticism from all segments of the society. Earlier, Pakistan's legal regime to curb fake news or dissemination suffered from absence of definition of fake news or disinformation in laws. For instance, PEMRA's law did contain the definition of fake news or disinformation and in 2023, for the first time, the definition of disinformation / misinformation was inserted through the PEMRA (Amendment) Act, 2023. Prior to the enactment of the Prevention of Electronic Crimes (Amendment) Act, 2025, the fake news or disinformation was handled by the Federal Investigation Agency, however, it remained unsuccessful in securing convictions from the courts due to flawed prosecution.

In the Prevention of Electronic Crimes (Amendment) Act, 2025, the fake news or disinformation has been criminalized with punishment of up to three (03) years or with fine up to two (02) million or with both. However, this has received strong backlash from both local and international journalists' associations. Contrarily, the Defamation Act, 2024 of the Punjab government declared defamation through fake news or disinformation as civil wrong. So, there is a gap in policy as whether fake news or disinformation shall be treated as a civil wrong or a criminal offence.

Pakistan's ranking in the World Press Freedom Index 2024, released by Reporters without Borders is 152 (Borders, 2024). Therefore, any policy adopted to curb fake news or disinformation has to maintain a fine balance between countering fake news and not restricting/hurting freedom of press. There is lack of consensus among the stakeholders as how to handle the dissemination of fake news or disinformation. Due to lack of consensus, a uniformed strategy could not evolve or develop. For instance, while drafting the Prevention of Electronic Crimes (Amendment) Act, 2025, the opposition political parties, digital rights activists and media associations / bodies were not consulted. Therefore, there is an uproar against the new law. Though, the new legislation proposed for creation of Social Media Protection Regulatory Authority, Social Media Council of Complaints, Social Media Tribunal and National Cyber Crime Investigation Agency but all are under the Government's control. The authority to appoint their chairpersons or heads or members exclusively vests with the Federal Government. Moreover, the Federal Government has powers to remove the chairpersons or members of the forums envisaged in the new legislation. This aspect of the legislation creates a credibility gap and, thus, such forums are perceived as tools for settling political scores. Same problem existed with the PEMRA as well, however, in 2023, by introducing an amendment, the power to appoint Chairman PEMRA was vested in a Parliamentary Committee having equal representation from both treasury and opposition benches in the National Assembly and the Senate. Similarly, the Government of Punjab, while introducing, the Defamation Act, 2024, did not consult all stakeholders.

The policy to handle fake news or disinformation suffers from the measures to convince the Social Media Platforms to enlist with Pakistan's authorities, appoint their representatives and open their local offices. Though, the recent legislation empowers the Social Media Protection and Regulatory Authority to enlist the Social Media Platforms, however, how to do that remains unanswered. Moreover, the Social Media Protection and Regulatory Authority is also empowered to issue directions to the Social Media Platforms for blocking of accounts or removal of content. Nevertheless, how will the Authority enforce its directions, does not make any mention in the law. For instance, the Brazil's court ordered blockade of social media platform X, formerly known as twitter, on the accusation that the accounts present there are spreading fake news. These accounts belonged to followers of President Jair Bolsonaro. The Court also ordered google and Apple to remove X from their software applications and directed that any individual found accessing X through virtual private network would be subjected to fine to the tune of R \$ 50,000 (BBC, 2024). Earlier, the social media platform resisted compliance of the Court orders, however, later on, the social media platform had to pay \$ 5 million fine, block the accounts and appoint local representative, thus, it was restored by the court (Wells, 2024).

The strategy to handle fake news or disinformation by blocking access to the social media platforms or installing firewall also suffers from lacunas. The people are able to access the social media platforms using VPNs. Even, the government functionaries use VPNs to operate their official accounts on Twitter or X. More importantly, such tactics have repercussions on Pakistan's economy. The IT industry, in general, while, freelancing and e-commerce, in particular, bear the brunt of such policies.

The International community and human rights organizations are strong proponents of freedom of speech and expression. The European Union, Amnesty International and Reporters without borders have expressed strong concerns on Prevention of Electronic Crimes (Amendment) Act, 2025. The EU's representative on human rights expressed that such measures could jeopardize Pakistan's GSP Plus status. The policy lacks a strategy as how to showcase our perspective internationally that fake news or disinformation is having dreadful social, political and economic impacts, thus, it is imperative to curtail it.

## *Analytical Techniques Employed*

### *Situational Analysis*

Gallup of Pakistan's Survey reveals that in Pakistan two in five adults and two thirds of men and women under the age of thirty use social media apps such as TikTok, Facebook and Instagram (Pakistan, 2024). It is also reported that Pakistan has over 111 million internet users and 64.6 percent of the total internet user are using social media (Jamal, 2024). Pakistan Telecommunication Authority has blocked 1.3 million URLs due to anti-Islamic, indecent and immoral content as of July, 2024 (Desk, The Express Tribune, 2024). The government has blocked approximately 80,000 SIM cards for disseminating fake news, following increasing concerns about misinformation on social media. (Desk, The Express Tribune, 2024). Due to wide spread of disinformation and fake news, the political environment is getting polarized. Different political parties and their supporters hurl abuses and mudslinging on each other due to political differences. These include character assassination campaigns as well. You tube channels spread fake stories regarding personal lives of the political leaders and the listeners, without questioning veracity of the claim, tend to believe in such tales. The Punjab Government, in May 2024, legislated the Defamation Act, 2024. The Supreme Court of Pakistan is even not safe from the wrath of fake news and disinformation. So much so that the last Chief Justice Qazi Faez Isa was dragged into a religious controversy through fake news when he announced judgement in Mubarak Sani's case. The Supreme Court's public relations officer had to come up with a press release clarifying the matter. In another instance, a fake news was spread that the Supreme Court judges quarrelled with each other on some issue. And the news was put to rest by a press release from the Supreme Court's Press Relations Department. The Inter Services Public Relations (ISPR) had also in the recent past held press conferences to dispel the impressions, by fake news, casted about Armed Forces. And the spread of fake news and disinformation continues spreading blatantly because of no fear of punishment. Recently, the Economic Coordination Committee of the Cabinet (ECC) approved Rs. 2 billion for Inter Services Public Relations to counter the propaganda.

The performance of FIA Cybercrime Wing dealing with fake news and unlawful content on social media and other platforms is abysmal and same is visible from the table no.1. In this backdrop, with the approval of the both houses of the Parliament, the Prevention of Electronic Crimes (Amendment) Act, 2025 has been notified.

<b>Cyber Crime Convictions (2020-2024)</b>						
<b>Year</b>	<b>Complaints</b>	<b>Verified</b>	<b>Enquiries</b>	<b>Cases</b>	<b>Accused arrested</b>	<b>Conviction</b>
2020	102,000	98,882	9,112	601	625	20
2021	115,868	80,803	15,766	1,224	1,306	38
2022	145,667	83,552	14,380	1,469	1,700	48
2023	152,136	82,396	18,012	1,375	2,007	92
2024	123,893	68,672	16,555	1,044	1,387	24
<b>Total</b>	<b>639,564</b>	<b>414,260</b>	<b>73,825</b>	<b>5,713</b>	<b>7,020</b>	<b>222</b>

**Table No.1: Source** (Ali K. , Dawn Newspaper, 2025)

### ***SWOT-EETH Analysis of Institutions responsible for curbing fake news & disinformation in Pakistan***

<b>Organization</b>	<b>Role</b>	<b>Performance</b>	
<b>Strengths</b>			<b>Enhancing Strengths</b>
Social Media Protection & Regulatory Authority	<ul style="list-style-type: none"> <li>In terms of section 2(1)(a) of the recently notified Act, titled "the Prevention of Electronic Crimes (Amendment) Act, 2025", Social Media Protection and Regulatory Authority has been Established</li> <li>In terms of section 2A of the Act, the Federal Government is to notify the Authority.</li> </ul> <p><b>Powers of the Authority</b> In terms of section 2 B of the Act, the Authority shall</p> <ul style="list-style-type: none"> <li>Promote education, research</li> <li>Ensure online safety / rights of the persons, on social media, from any harm</li> </ul>	<ul style="list-style-type: none"> <li>Before the creation of this Authority, there was no specified body regulating social media in Pakistan.</li> <li>FIA Cyber Crime Wing was used to deal with dissemination of fake news or unlawful content on social media</li> <li>The aspect of promotion of education and research in the field of social media in general</li> </ul>	<ul style="list-style-type: none"> <li>The Federal Government's exclusive role in appointment of Chairpersons and members will damage the credibility and impartiality of the Authority. So, the appointment mechanism needs to be revisited. It will strengthen the</li> </ul>

	<ul style="list-style-type: none"> <li>• Regulate unlawful or offensive content</li> <li>• Enlist social media platforms</li> <li>• Renew or suspend or revoke enlistment of social media platforms</li> <li>• Partially or fully block social media platform</li> <li>• Issue guidelines to social media platforms</li> <li>• Impose fines</li> <li>• Engage in HR development &amp; training</li> <li>• Enter into contracts for discharging duties, capacity building</li> <li>• Receiving and processing complaints and providing remedial measures</li> </ul> <p>In terms of section 2 C, the aggrieved person can file complaint to the Authority</p> <ul style="list-style-type: none"> <li>• For blocking of offensive content</li> <li>• Blocking access to fake information</li> <li>• The Chairperson of the Authority shall pass orders within 24 hours for removal of the content</li> </ul> <p>In terms of section 2D, the Authority shall consist of</p> <ul style="list-style-type: none"> <li>• Chairperson</li> <li>• Eight other members</li> <li>• Secretary Interior, Chairman PTA, Chairman PEMRA as ex-officio members</li> <li>• Chairperson and members shall be appointed for non-extendable tenure of five years</li> </ul>	<p>and fake news in particular is a positive aspect of this Authority</p> <ul style="list-style-type: none"> <li>• This Authority will issue directions for blocking of social media platforms if they are proven to be disseminating unlawful content.</li> <li>• The aspect of training of Human Resource is also a positive aspect as so far nothing much has been done on this side.</li> <li>• The Authority, after this new act, can sign Mousy, Agreements and contracts with its counterparts. It will open avenue for learning from other countries as how are they handling social media to curb fake news or disinformation.</li> <li>• The Authority's composition</li> </ul>	<p>Authority. This clause may be rephrased as with the consensus of Leader of the House and Leader of the Opposition in the National Assembly or with the approval of a parliamentary committee having equal number of members of opposition and treasury benches from the National Assembly and the Senate.</p> <ul style="list-style-type: none"> <li>• Moreover, the clause that the directions of the Federal Government are binding on the Authority will also impact the role of the Authority. There will remain an apprehension that the Government will use the</li> </ul>
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	<p><b>Qualification of other members</b></p> <ul style="list-style-type: none"> <li>• A Journalist with not less than 10 years experience</li> <li>• A software engineer with not less than 10 years experience</li> <li>• An advocate having not less than 10 years of experience</li> <li>• A social media professional having 10 years of experience</li> <li>• A private sector IT entrepreneur</li> </ul> <p>In terms of section 2E, the Federal Government has powers to remove Chairperson or members of the Authority</p> <p><b>Powers of Chairperson of the Authority</b></p> <ul style="list-style-type: none"> <li>• In terms of section 2G, the Chairperson shall be CEO of the Authority</li> <li>• The decision of the Authority shall be taken with majority</li> <li>• The Chairperson shall have exclusive powers to issue directions for blocking of any unlawful online content or fake news. However, his decision will be subject to ratification by the Authority</li> </ul> <p><b>Powers of the Federal Government</b></p> <p>In terms of section 2O of the recently approved Act, the Federal Government shall have powers to issue directions to the Authority on policy matters and such directions shall be binding.</p>	<p>is a mix of civil servants as well as professionals.</p> <ul style="list-style-type: none"> <li>• The most important element of the new Authority is the “non-extendable” tenure of the Chairman and members. Thus, they will not be lured into dancing to the tunes of the political executive in order to get extension in their tenure.</li> <li>• It is positive point that a journalist will also be a member of the Authority. This will help in mitigating the apprehensions of the journalists that the recently approved Act is designed to silence their voices.</li> <li>• Though it is mentioned that the lawyer having ten years experience will be made member of</li> </ul>	<p>Authority to silence its critics. To enhance the strength of the Authority, it shall be made independent or it be made answerable to a Committee of the National Assembly instead of the Government.</p> <ul style="list-style-type: none"> <li>• The process for appointment of journalist in not clarified. This leaves discretionary power with the Government to appoint its favourite on the Authority. To make this appointment impartial, this clause shall be modified for appointment with the consent of the Pakistan Federal Union of Journalists</li> </ul>
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	<p><b>Enlistment of Social Media Platforms</b></p> <ul style="list-style-type: none"> <li>• In terms of section 2Q, the Authority may require any social media platform to enlist itself</li> <li>• The authority may stipulate the conditions or requirements for such enlistment</li> </ul> <p><b>Removal of online content</b></p> <p>In terms of Section 2R of the recently approved Act, the authority shall have powers to issue directions for removal of content of following type;</p> <ul style="list-style-type: none"> <li>• Against the ideology of Pakistan;</li> <li>• Intimidating &amp; inciting violence or religious hatred;</li> <li>• Containing obscene or pornographic material;</li> <li>• Is known to false or fake or there exists sufficient reasons to believe that the same may be false or fake;</li> <li>• Contains aspersions against any person including members of judiciary or parliament or armed forces or provincial assembly;</li> <li>• The portion of National Assembly or Senate proceedings declared by the Chair of the Session as expunged, shall not be on aired or reported.</li> </ul>	<p>the Authority, however, the field of his experience has not been specified.</p> <ul style="list-style-type: none"> <li>• The Chairperson shall have exclusive powers to issue directions regarding removal of a content carrying fake news or disinformation subject to ratification from the Authority.</li> <li>• The clause prohibiting the Chairperson or members from engaging in media related business will avoid conflict of interest, thus, it is strength of the Authority. Furthermore, the Chairperson or members, on expiry of their tenure, shall not, for one year, seek employment is a clause to strengthen the Authority.</li> </ul>	<ul style="list-style-type: none"> <li>• To enhance strength of the Authority, the Chairman's exclusive powers to issue directions for removal of content disseminating fake news or disinformation be converted into powers to be exercised by the Authority with consensus. In case the Authority does not ratify the decision of the Chairman, it will create an embarrassing situation. And in case, the Authority rubberstamps every decision of the Chairman then eyebrows will be raised on conduct of other members. So, like other decisions,</li> </ul>
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		<ul style="list-style-type: none"> <li>• In terms of section 2 N of the recently notified Act, the Authority is to submit its annual report regarding operations and finances to the National Assembly and the Senate of Pakistan is to ensure oversight of the Parliament.</li> </ul>	<p>this decision shall also be taken on the basis of majority.</p> <ul style="list-style-type: none"> <li>• To enhance strength of the Authority, the Federal Government shall not have arbitrary powers to remove the Chairpers on or members of the Authority. There shall be security of the tenure. In case of premature removal, like Chairman NAB, Chief Election Commissioner or Judges of the Supreme Court or High Courts, there shall be an independent forum. By this way, the independence or impartiality of the Authority will increase.</li> </ul>
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			<ul style="list-style-type: none"><li>• To become member of the Authority, the lawyer shall have experience of dealing matters related to cybercrime or social media, thus, to enhance strength of the Authority, this clause shall be amended.</li><li>• The clause regarding forbidding reporting of the National Assembly and Senate proceedings declared by the Chair as expunged, is inviting unnecessary criticism so same shall be deleted. The purpose of the proposed Act shall remain strictly to the extent of curbing fake news or disinformation or removal of unlawful content.</li></ul>
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<p><b>Social Media Complaint Council</b></p>	<p>In terms of section 2T of the Prevention of Electronic Crimes (Amendment) Act, 2025, the Federal Government shall constitute a Social Media Complaint Council.</p> <p><b>Composition</b></p> <ul style="list-style-type: none"> <li>• It shall consist of a chairperson and four members including one ex-officio member.</li> <li>• The chairperson and members shall be appointed by the Federal Government for three (03) years further extendable for another similar term.</li> <li>• The chairperson and members shall be eminent professionals with at least fifteen (15) years of experience in information technology, law or social media policy.</li> </ul> <p><b>Removal of Chairperson or Members</b></p> <p>The Federal Government shall have powers to remove the Chairperson or members of the Council</p>	<ul style="list-style-type: none"> <li>• It will provide a forum to a person aggrieved of unlawful content of fake news or disinformation to lodge his or her complaint.</li> <li>• Prior to this, such Council of Complaint existed for Electronic Media under PEMRA Ordinance.</li> <li>• The tenure of chairperson and members have been defined but same is also extendable.</li> </ul>	<ul style="list-style-type: none"> <li>• By removing the role of Federal Government in appointment of Chairpersons &amp; members of the Council, its credibility can be increased. The appointment shall be through Parliamentary Committee having equal representation of opposition members and members of treasury benches.</li> <li>• Fixed and non-extendable will enhance the strength of the Council. The chairperson and members will act independently as there is no expectation of any favour from the government.</li> </ul>
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			<ul style="list-style-type: none"> <li>The Federal Government shall not have powers to remove the Chairpersons or member of the Council.</li> </ul>
<b>Social Media Protection Tribunal</b>	<ul style="list-style-type: none"> <li>In terms of section 2U of the Prevention of Electronic Crimes (Amendment) Act, in case of non implementation of any directions of the Authority by the Social Media Platform, it may approach the tribunal for appropriate action.</li> <li>In terms of section 2 V of the Prevention of Electronic Crimes (Amendment) Act, 2025, the Federal Government shall establish as many Tribunals for the purpose of this Act as it determines.</li> </ul> <p><b>Composition of the Tribunal</b></p> <ul style="list-style-type: none"> <li>The Chairman of the tribunal shall be a person who has been or is qualified to be judge of the High Court.</li> <li>A journalist having not less than twelve years of experience.</li> <li>A software engineer and an expert in the field of social media rights</li> </ul>	<ul style="list-style-type: none"> <li>A forum of adjudication has been provided.</li> <li>The time limit for disposal of the case has fixed.</li> <li>By appointing a person who has served or is eligible to become judge of the high court, better adjudication of cases will be achieved.</li> <li>Journalists shall also have representation on the Tribunal. This will allay the apprehensions of the Journalists.</li> <li>Inclusion of technical or professional member is a step in the right direction as he will give advice on technical matters.</li> </ul>	<ul style="list-style-type: none"> <li>The Federal Government shall not have powers to arbitrarily remove the chairperson of the Tribunal. By amending this clause to provide for some neutral forum to decide about removal of chairperson, the Social Media Tribunal can be strengthened.</li> <li>The appointment of Chairpersons and members shall be in consultation with the Chief Justice of Pakistan, it will strengthen the</li> </ul>

	<ul style="list-style-type: none"> <li>Chairman &amp; members to be appointed by the Federal Government for a period of three years</li> </ul> <p><b>Removal</b></p> <ul style="list-style-type: none"> <li>The Federal Government may remove the Chairperson or members of the Tribunal</li> </ul> <p><b>Time Limit</b></p> <ul style="list-style-type: none"> <li>The Tribunal shall decide the case within 90 days</li> </ul> <p><b>Jurisdiction</b></p> <ul style="list-style-type: none"> <li>Any individual aggrieved by the decision of the Authority shall also prefer an appeal before the Tribunal</li> </ul> <p><b>Appeal against Tribunal</b></p> <ul style="list-style-type: none"> <li>The appeal against the decisions of the Tribunal shall be preferred in the Supreme Court of Pakistan</li> </ul> <p><b>Punishment for Fake News and Disinformation</b></p> <p>In terms of Section 26A of the proposed Act, anyone involved in dissemination of fake news or disinformation shall be punished for a sentence up to three (03) years or a fine to the tune of two (02) million or with both.</p>	<ul style="list-style-type: none"> <li>Fake News or disinformation has been criminalised with three (03) years sentence and two (02) million fine.</li> </ul>	<p>Tribunal's autonomy.</p> <ul style="list-style-type: none"> <li>Disposal of cases within a stipulated time can further be strengthened by adding that no adjournment shall be granted.</li> <li>Moreover, to avoid frivolous litigations, a clause shall be inserted empowering the Tribunal to put cost.</li> <li>Instead of criminalizing fake news or disinformation, it shall be dealt as civil offence having punishment of fines and damages.</li> </ul>
<b>National Cyber Crime Investigation Agency</b>	Through the Prevention of Electronic Crimes (Amendment) Act, 2025, the Federal Government shall establish an Investigation Agency to be called the National Cyber Crime Investigation Agency,	<ul style="list-style-type: none"> <li>A specialized agency to deal with social media related matters including fake news and</li> </ul>	<ul style="list-style-type: none"> <li>The trained human resource of FIA shall be absorbed in the Agency. It will</li> </ul>

	<p><b>Composition</b></p> <ul style="list-style-type: none"> <li>• It shall be headed by Director General who shall be appointed by the Federal Government for three years.</li> <li>• He shall have powers of Inspector General.</li> <li>• For the purpose of inquiry and investigation, the officers of the agency shall have same powers as a police officer has under the Code of Criminal Procedure, 1890.</li> <li>• Cyber Crime Wing of FIA shall cease to exist.</li> <li>• It shall establish capacity of forensic analysis of data or in information systems.</li> <li>• The forensic reports generated by the agency have been declared admissible as evidence in the court.</li> </ul>	<p>disinformati on.</p> <ul style="list-style-type: none"> <li>• As powers of search, seizure and raid are derived from the Code of Criminal Procedure Code, 1898, therefore, the same will vest in the officers of the agency.</li> <li>• Most important part is that the evidence collected by the agency through its forensic analysis has been declared admissible in the Court of Law.</li> </ul>	<p>enhance strength.</p> <ul style="list-style-type: none"> <li>• For capacity building of officers, they shall be offered training in foreign countries dealing with this subject.</li> <li>• By appointing an aboveboard, honest and professional officer as head of the Authority, its strengths can be enhanced.</li> <li>• The Agency shall have the services of experts too.</li> </ul>
<b>Ministry of Information &amp; Broadcasting</b>	<ul style="list-style-type: none"> <li>• Under Schedule II of the Rules of Business, 1973, administration of PTV, APP, PEMRA, PCP, PID come within its ambit.</li> <li>• Mouthpiece for informing public about government policies.</li> <li>• Issuing rebuttals to fake news &amp; disinformation</li> <li>• Awareness campaigns to educate masses about fake news and disinformation.</li> </ul>	<ul style="list-style-type: none"> <li>• Press conferences to counter fake news or disinformation.</li> <li>• Press release to issue correct facts or news story.</li> <li>• Running a fact check Twitter or X handle which quickly terms a news devoid of facts as Fake News.</li> </ul>	<ul style="list-style-type: none"> <li>• Mostly fake news or disinformation is disseminated when the actual events are deliberately kept hidden from the public. And it is the job of Ministry of Information and Broadcasting to keep</li> </ul>

	<ul style="list-style-type: none"> <li>• Bridge between Governments and journalists.</li> <li>• Running fact-checking campaign through social media or electronic media.</li> </ul>	<ul style="list-style-type: none"> <li>• A point of contact for the journalists or individuals for counter checking the facts before doing a story.</li> <li>• Trainings (The Express Tribune, 2024)</li> </ul>	<p>the general public updated on all happenings.</p> <ul style="list-style-type: none"> <li>• By frequent use of Factcheck on social media platforms, the fake news can be curbed by the Ministry of Information and Broadcasting (Dawn Newspaper, 2018).</li> <li>• The Ministry can enhance its strength by organizing seminars and workshops in schools and universities to spread awareness about fake news or disinformation. As a large chunk of Pakistan's population consists of youngsters so they shall be taught to differentiate between fake news and authentic news.</li> </ul>
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			<ul style="list-style-type: none"> <li>• The Ministry shall impart trainings to the Journalists in collaboration with Pakistan Press Foundation, the Global Neighbourhood for Media Innovation, and the Centre for Excellence in Journalism (CEJ) at IBA-Karachi.</li> <li>• Ministry has a power to issue advertisements. It can use that power to encourage credible news and curb fake news or disinformation.</li> </ul>
<b>Pakistan Electronic Media Regulatory Authority (PEMRA)</b>	<ul style="list-style-type: none"> <li>• Section 2(ha) the PEMRA Ordinance, 2002 (Justice, The Pakistan Code, 2025) defines disinformation, it was inserted in 2023.</li> <li>• In terms of section 4 of the PEMRA Ordinance, 2002, it regulates operations of all</li> </ul>	<ul style="list-style-type: none"> <li>• Issuing warnings to the TV Channels to follow code of conduct (Director General Operations, 2022).</li> <li>• Creating deterrence by Penalising</li> </ul>	<ul style="list-style-type: none"> <li>• Strengths of PEMRA can be enhanced if it establishes the element of neutrality and credibility by proving that it is not a tool in the hand</li> </ul>



	<p>broadcast medias and distribution services in Pakistan.</p> <ul style="list-style-type: none"> <li>• In terms of section 20(j) of the PEMRA Ordinance, the terms and condition for issuing license include not to air disinformation.</li> <li>• Imposition of fines or cancellation of licenses.</li> <li>• Council of Complaints to deal with complaint of disinformation.</li> <li>• Rule 2(1)(a) of the Electronic Media Code of Conduct, 2015 (Broadcasting, 2025) defines Aspersions as spread of harmful and fake charges, Rule 3(1)(i) prohibits licensee from airing false comments and Rule 3(1)(l) prohibits airing of defamatory content.</li> </ul>	<p>TV Channels for on-airing fake news e.g. on 21st April, 2020, it imposed 1 million fine on Dawn News TV for telecasting fake news regarding death of UK's Prime Minister.</p> <ul style="list-style-type: none"> <li>• Compelling TV Channels to tender apology for fake news or disinformation (Khan, 2019).</li> </ul>	<p>of political executive.</p> <ul style="list-style-type: none"> <li>• Its legal wing needs to be revamped as most of the punitive measures taken by PEMRA are struck down by the Courts.</li> </ul>
<b>Ministry of Information Technology &amp; Telecommunication</b>	<ul style="list-style-type: none"> <li>• Under Schedule II of the Rules of Business, 1973, promotion of IT applications, planning, policy making and legislation covering all aspects of telecommunication (Division, 2025).</li> <li>• Digital literacy</li> <li>• Initiative of Firewall</li> <li>• Internet &amp; Technology within its preview</li> </ul>	<ul style="list-style-type: none"> <li>• It oversees the implementation of Digital Pakistan Policy which aims at ensuring secure digital echo system of in the country.</li> <li>• It is exploring AI &amp; Machine Learning tools to curb fake news and</li> </ul>	<ul style="list-style-type: none"> <li>• Pakistan has only two fact-checking services at present that are signatories of the International Fact Checking Network (IFCN) and members of Facebook's third-party fact-checking</li> </ul>

		disinformati on.	program, and only one of these is purely local. These two fact- checking organizati ons are: AFP Fact Check Pakistan, which is part of the French news agency Agence France- Presse's global fact checking operations , and the local organizati on Soch Fact Check, which is independe ntly establishe d and operated by Pakistani fact- checkers. In compariso n, India has at least 14 IFCN signatory fact- checkers (Rehmat, Counterin g disinforma tion in Pakistan - Lessons and recommen
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			ditions for Digital Journalism , 2022).
<b>Pakistan Telecommunication Authority</b>	<ul style="list-style-type: none"> <li>As per Section 2(h) of the Pakistan Telecommunication (Re-organization) Act, 1996. Authorization for establishment, maintenance and operation of telecommunication system is its responsibility.</li> <li>Promotion of high-quality services is also its responsibility as per section 4(d) the Pakistan Telecommunication (Re-organization) Act, 1996.</li> <li>In terms of section 6 of the Pakistan Telecommunication (Re-organization) Act, 1996, it is responsibility of the authority to protect interests of the users of the telecommunication services.</li> <li>Removal of content containing Fake News or Disinformation.</li> <li>Blocking of website or social media platform containing Fake News or disinformation.</li> </ul>	<ul style="list-style-type: none"> <li>Requests Social Media Platforms for removal of fake news/ disinformation.</li> <li>Since January, the Pakistan Telecommunication Authority (PTA) has removed/blocked over 44,000 social media accounts or posts from Facebook, Twitter and YouTube for spreading fake news. A total of 20,829 unlawful Facebook posts and accounts have been removed or blocked from the said platform by PTA. From YouTube, A total of 12,776 posts, videos or YouTube accounts have been blocked or removed by PTA during this time. Whereas from Twitter, a total of</li> </ul>	<ul style="list-style-type: none"> <li>Interagency collaboration will enhance PTA's strengths.</li> <li>PTA shall have professionals on lead role in the organization.</li> </ul>

		<p>10,813 twitter posts or accounts were blocked or completely removed from the platform during January 2023 till this date.</p> <ul style="list-style-type: none"> <li>• However, no action against those who spread misinformation on social media.</li> <li>• Interestingly, a total of 61 posts based on fake news were made by an official account of a major political party in just one month- July 2024, data fetched by authorities unfolded. (Abbasi, 2024).</li> </ul>	
<b>Federal Investigation Agency</b>	<ul style="list-style-type: none"> <li>• Registration of cases</li> <li>• Investigation against the individual disseminating Fake news or Disinformation or propagating unlawful content.</li> </ul>	<ul style="list-style-type: none"> <li>• Cyber Crime Wing</li> <li>• Prosecutors to deal with cases in the Courts</li> <li>• Powers to Investigate</li> <li>• Assistance from Intelligence Agencies regarding data</li> <li>• Powers to raid places or take into</li> </ul>	<ul style="list-style-type: none"> <li>• Federal Investigation Agency can enhance its strengths by capacity building of prosecutors. Most of the accused get acquitted because of insufficient evidence</li> </ul>

		custody individuals for evidence collection	or the prosecutors fail to establish their case.
<b>Editorial Boards</b>	<ul style="list-style-type: none"> <li>Internal regulatory mechanism within Print or Electronic Media entities.</li> <li>Responsibility of verifying or checking veracity of a news or content before publishing or on-airing any content.</li> <li>If this tier is strong, less need of external monitoring or scrutiny.</li> </ul>	<ul style="list-style-type: none"> <li>System of internal accountability.</li> <li>Publish rebuttals if proven that the news published is incorrect or fake.</li> <li>Issue clarification in case some information is not properly presented.</li> </ul>	<ul style="list-style-type: none"> <li>Editorial Boards can enhance their strengths by introducing a system of punishment and rewards. The journalists whose news has been proven fake, shall be punished, while, the one whose news has a record of filing credible stories shall be rewarded.</li> <li>Invest in fact checking resources.</li> </ul>
<b>Courts</b>	<ul style="list-style-type: none"> <li>Punishing individuals, organizations or platforms responsible for fake news or disinformation.</li> <li>Deciding defamation suits.</li> </ul>	<ul style="list-style-type: none"> <li>In Asma Shirazi Vs. Pemra Council of Complaints, the Islamabad High Court's Justice Mohsin Akhtar Kiyani passed an order directing</li> </ul>	<ul style="list-style-type: none"> <li>The Courts can enhance their strength by quick disposal of pending cases. If the courts are able to enforce the laws of libel and defamation, there</li> </ul>

		<p>ARY News to broadcast an apology as well as pay Rs. 50,000 damages for airing fake news against Ms. Asma Shirazi by placing her picture wrongly with the news item (Guramani, 2023).</p> <ul style="list-style-type: none"> <li>• The laws related to defamation, libel or fake news are enforced by the courts.</li> <li>• A check on government's abuse of power.</li> <li>• Create deterrence against spread of fake news if sentences are awarded.</li> </ul>	<p>will be no need to criminalise the dissemination of fake news or disinformation.</p>
<b>Social Media Platforms</b>	<p><b>The Prevention of Electronic Crimes (Amendment) Act, 2025</b></p> <ul style="list-style-type: none"> <li>• In terms of section 25 of the Prevention of Electronic Crimes (Amendment) Act, 2025, the social media platforms shall maintain an effective and transparent procedure for handling complaints about unlawful content including fake news.</li> </ul>	<ul style="list-style-type: none"> <li>• Accountability of the content being aired or posted.</li> <li>• Authority to remove the content or block the proponent of that content.</li> <li>• Awareness &amp; Digital Literacy.</li> </ul>	<ul style="list-style-type: none"> <li>• Social Media Platforms shall introduce the concept of self regulation.</li> <li>• If on the comments section, most of the people are writing that the news is incorrect or fake,</li> </ul>

	<ul style="list-style-type: none"> <li>In terms of section 2B of the Act, the Social media platforms shall enlist themselves with Social Media Protection and Regulatory Authority and if they do not comply with provisions of the Act, they will be blocked</li> </ul> <p><b>Others</b></p> <ul style="list-style-type: none"> <li>Placing checks that information posted is correct and authentic.</li> <li>Removing contents which are fake.</li> <li>Blocking accounts or channels airing fake news or disinformation.</li> </ul>		<p>then the Platform shall have a policy to remove it.</p> <ul style="list-style-type: none"> <li>The accounts continuously spreading fake news or disinformation shall be blocked as per policy. This will increase credibility of social media platforms.</li> <li>In 2018 Facebook started one such project of fact checking in Pakistan prior to elections (The News International, 2018).</li> <li>The Social Media Platforms shall spread awareness among users regarding fake news or disinformation (Techjuice, 2018)</li> </ul>
<b>Inter Public Services Relations (ISPR)</b>	<ul style="list-style-type: none"> <li>Provision of information regarding Armed Forces.</li> <li>Countering Fake news or</li> </ul>	<ul style="list-style-type: none"> <li>Press release to address fake news.</li> <li>Posting correct facts</li> </ul>	<ul style="list-style-type: none"> <li>ISPR can enhance its strengths by collaborating with</li> </ul>

	<p>disinformation regarding Armed Forces.</p> <ul style="list-style-type: none"> <li>Awareness among masses through workshops and seminars.</li> </ul>	<p>on X (Twitter).</p> <ul style="list-style-type: none"> <li>Visiting universities to educate students about fake news or disinformation.</li> <li>Workshops for Journalists.</li> <li>Monthly briefings for media to set the record straight.</li> </ul>	<p>other entities such as Ministry of Information &amp; Broadcasting, PTA, FIA etc.</p> <ul style="list-style-type: none"> <li>It shall dilute the perception that it controls media.</li> <li>It shall help other government entities in increasing digital literacy.</li> </ul>
<b>Organization</b>	<b>Weakness</b>		<b>Eliminate Weakness</b>
<b>Social Media Protection &amp; Regulatory Authority</b>	<ul style="list-style-type: none"> <li>Chairperson and members are to be appointed by the Federal Government.</li> <li>Chairperson and members can be removed by the Federal Government.</li> <li>The definition of expression "aspersions" is vague, thus, the it can be used for political victimization.</li> <li>The task to enlist Social Media Platforms is ambitious and no description has been provided in the Prevention of Electronic Crimes (Amendment) Act, 2025 as how will the Authority force a platform to register or enlist.</li> <li>As it is difficult to enlist the Social Media Platforms, therefore, there is a genuine apprehension that the powers will be used against the customers or users of the Platforms.</li> </ul>		<ul style="list-style-type: none"> <li>The Authority shall be made independent of the Government's control else it will be seen as a tool to silence critics. The clause regarding arbitrary removal of Chairpersons and members of the Authority shall be deleted.</li> <li>What measures will the Authority take to ensure enlistment of the</li> </ul>



		social media platforms need to be explained in the Act.
<b>Social Media Complaint Council</b>	<ul style="list-style-type: none"> <li>• Federal Government's powers to appoint and remove the chairperson and members of the Complaint Council make it subservient to the political executive.</li> <li>• The tenure of Chairperson or members is extendable which means they will be lured to act at the behest of the government for longevity of their jobs.</li> <li>• How will it enforce orders on the Social Media Platforms is unexplained.</li> </ul>	<ul style="list-style-type: none"> <li>• The clause regarding tenure of Chairpers on and members of the Council shall be amended to make their term fixed and not extendable . By this way, they will not be seeking favours from the Governme nt by obliging it.</li> <li>• Unless the Social Media Platforms have offices in Pakistan, it is impossible to enforce orders against them.</li> </ul>
<b>Social Media Tribunal</b>	<ul style="list-style-type: none"> <li>• Too much discretion with the Government for appointment of the members of the Tribunal.</li> <li>• The appellate forum of High Courts is missing as the Act states that the appeal will be heard by the Supreme Court of Pakistan.</li> <li>• The law does not specify if the Tribunal enjoys the powers of the Civil Court or Criminal Court to conduct proceedings.</li> <li>• To criminalise dissemination of fake news or false information will end up in self censorship from the journalists</li> </ul>	<ul style="list-style-type: none"> <li>• The appeal, at first instance, against the orders of the Tribunal shall lie to the concerned High Court. By doing this</li> </ul>

	<p>which is inappropriate in a democracy. Moreover, there is an apprehension that the clause will be used to imprison or incarcerate the critics of the Government.</p>	<p>one remedial forum will increase. Moreover, the burden of cases on the Supreme Court of Pakistan will not increase.</p> <ul style="list-style-type: none"> <li>• The Tribunal shall be given powers of Civil or Criminal Court so that it can summon witnesses and record statements.</li> <li>• Instead of imprisonment, more focus shall be on damages or fines against the perpetrators of fake news or disinformation.</li> </ul>
<b>National Cyber Crime Investigation Agency</b>	<ul style="list-style-type: none"> <li>• New agency with no trained Human Resource.</li> <li>• Recruiting quality human resource and their capacity building will take time.</li> <li>• Building its own forensic laboratory is an ambitious target in already constrained fiscal situation of Pakistan.</li> <li>• There will be tug of war between different occupational groups as who is going to become chairperson of the agency.</li> <li>• Apprehension exists that like FIA, it will also be used to target opponents and silence critics (Dawn Newspaper, 2025).</li> </ul>	<ul style="list-style-type: none"> <li>• Scrutinizing the existing human resource of FIA Cyber Wing, after eliminating deadwood, rest shall be absorbed in the Agency.</li> <li>• All LEAs and IAs to</li> </ul>

		extend cooperation to the Agency in curbing fake news and disinformation.
<b>Ministry of Information &amp; Broadcasting</b>	<ul style="list-style-type: none"> <li>• Nepotism and favouritism instead of hiring professionals and experts to handle the issue of fake news (Daily Ausaf, 2024).</li> <li>• Lacks credibility as public does not trust the official version, thus, they believe in fake news or disinformation.</li> <li>• Lack of focus on providing training to the Journalists and Public regarding Fake News &amp; Disinformation (Dawn Newspaper, 2024).</li> <li>• Minimal presence on social media and undue reliance on traditional media.</li> </ul>	<ul style="list-style-type: none"> <li>• Need to activate Fact Check up mechanism as is done in India and other European Countries e.g. A government-operated agency in India will now monitor and conduct fact-checks on social media regarding government-related topics. The Ministry of Electronics and IT announced the amendments to the IT Rules 2021 in a gazette notification dated 21 March 2024 (Mansab, 2024).</li> <li>• Hiring of professionals and experts who can</li> </ul>

		increase presence of government and ministry in the digital space.
<b>Pakistan Electronic Media Regulatory Authority</b>	<ul style="list-style-type: none"> <li>• PEMRA lacks credibility and is viewed as an authority who acts on the political behest of the government (Hussain, 2022).</li> <li>• Social media is out of its preview and most of the fake news or disinformation in on-aired through social media platforms.</li> <li>• No coordination with fact-checking organizations.</li> <li>• Unable to start campaigns for public awareness regarding fake news.</li> <li>• The decisions of PEMRA are often overturned by the High Courts and Supreme Court.</li> </ul>	<ul style="list-style-type: none"> <li>• Improving quality of human resource in legal wing as most of the decisions are nullified in the Court of Law.</li> <li>• Strengthening Council of Complaints.</li> </ul>
<b>Ministry of Information Technology</b>	<ul style="list-style-type: none"> <li>• In order to eliminate fake news or disinformation, the strategies, such as internet slow-down, blocking social media platforms or installation of firewall, adopted by the Ministry of Information Technology and Telecommunication have repercussions on the economy. Top10VPN.com's report revealed that due internet shutdowns, Pakistan's economy suffered highest losses to the tune of \$ 1.6 billion. Such tactics are not proving helpful in deterring spread of fake news or disinformation but have serious consequences for freelancers, the individuals and companies whose work or business is dependent on internet.</li> </ul>	<ul style="list-style-type: none"> <li>• The Ministry shall, instead of shutting down internet, introduce fact-checking twitter handles or increase digital literacy so that fake news or disinformation can be countered.</li> <li>• It shall engage tech companies to find solutions to curb fake news with the help of AI.</li> </ul>

<p><b>Pakistan Telecommunication Authority</b></p>	<ul style="list-style-type: none"> <li>PTA has the ability to block a social media platform or remove content from a social media platform, however, if a fake news or disinformation is spread through WhatsApp or signal or telegram then no such mechanism exists to counter that.</li> </ul>	<ul style="list-style-type: none"> <li>PTA shall, like it does with other social media platforms, engage with Whatsapp or Telegram etc. to counter spread of fake news or disinformation.</li> <li>WhatsApp was used to spread fake news in India too. However, the Indian authorities engaged with Whatsapp management and with mutual collaboration, limits on message forwarding was introduced. Moreover, whatsapp helped Indian authorities in launching awareness campaigns to teach users as how to identify fake news or disinforma</li> </ul>
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		<p>tion.</p> <p>Moreover, the Indian authorities employed machine learning to detect and ban accounts involved spreading fake news.</p>
<b>Federal Investigation Agency</b>	<ul style="list-style-type: none"> <li>• Lower number of convictions</li> <li>• Mishandling of evidence</li> <li>• Accused get acquitted due to nonprofessional prosecution</li> <li>• The conviction rate in cybercrime cases over the past five years remained below 5 per cent, with only a minuscule proportion of Pakistan's mobile and internet users reporting digital crimes to authorities. According to a written reply submitted by the interior ministry to the National Assembly, since the year 2020, 7,020 accused have been arrested on cybercrime charges, with only 222 being convicted – a conviction rate of only 3.16pc (Ali K. , Dawn Newspaper, 2025).</li> </ul>	<ul style="list-style-type: none"> <li>• Improving prosecution of cases in the courts.</li> <li>• Resolving the issue of admissibility of evidence by introducing amendments in Qanoon-e-Shahdat.</li> <li>• Eliminating favouritism while appointing prosecutors.</li> <li>• The Prevention of Electronic Crimes (Amendment), Act, 2025 proposes abolishment of FIA Cyber Crimes Wing on establishment of NCCIA.</li> </ul>
<b>Courts</b>	<ul style="list-style-type: none"> <li>• Inability to enforce Laws of Defamation and Libel</li> </ul>	<ul style="list-style-type: none"> <li>• The Laws of defamation</li> </ul>

	<ul style="list-style-type: none"> <li>• No punishment awarded to the people disseminating Fake News or Disinformation</li> <li>• Even Courts are itself victim of Fake News and Disinformation e.g. clarification of the Supreme Court in Mubarak Sani's case.</li> </ul>	<p>n and libel shall be enforced on the pattern of western countries e.g. the UK Defamation Act, 1996. A lot of Pakistani Nationals have won cases in UK but none in Pakistan e.g. Gul Bukhari, Ishaq Dar against ARY. (The Friday Times, 2022).</p> <ul style="list-style-type: none"> <li>• The disposal of cases related to defamation or libel shall be made time bound.</li> </ul>
<b>Editorial Boards</b>	<ul style="list-style-type: none"> <li>• They are reactionary instead of being proactive.</li> <li>• Swayed by the concept of ratings or viewership.</li> <li>• Lost credibility due to commercialism.</li> <li>• News is not verified from multiple sources.</li> <li>• Social Media does not have any editorial boards.</li> </ul>	<ul style="list-style-type: none"> <li>• The Editorial Boards shall ask their organizations to provide fact checking training to all journalists as well as board members.</li> <li>• A study by Freedom Network and Digital Media</li> </ul>

		<p>Alliance of Pakistan (DigiMAP), with support from IMS, unfolded that journalistic and factchecking disinformation responses in the country have struggled due to lack of conceptual understanding of disinformation among journalists, monetisation trends that incentivise sensationalist news and reduce the impact of capacity building initiatives, lack of financial sustainability of responses, language barriers and political backlash (Rehmat, Counterin g Disinformation in Pakistan - Lessons and Recomme</p>
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		ndations for Digital Journalism , 2022)
<b>Social Media Platforms</b>	<ul style="list-style-type: none"> <li>Commercial interests prevail over measures to curb fake news.</li> <li>In the garb of freedom speech, fake news is promoted.</li> </ul>	<ul style="list-style-type: none"> <li>Social media platforms shall add a fact checking feature so that fake news or disinformation is effectively countered.</li> <li>A data base shall be maintained of accounts frequently involved in fake news or unlawful content.</li> </ul>
<b>Inter Services Public Relations</b>	<ul style="list-style-type: none"> <li>It sees everything with a lens of national security, thus, ends up curtailing or manoeuvring the flow of information.</li> <li>There is a perception that it has a role to play in contributing fake news or disinformation particularly in political domain (Shaheen, 2022).</li> <li>Most of the news related to security matters is deliberately kept hidden from public discourse, thus, generating fake news or speculation.</li> </ul>	<ul style="list-style-type: none"> <li>It shall not securitize the matter of disinformation or fake news.</li> <li>It shall aid the freedom of expression or information shall be ensured but with responsibility. It will improve public perception of ISPR.</li> </ul>
<b>Organization</b>	<b>Opportunities</b>	<b>Taking advantage of opportunities</b>

<p><b>Social Protection Regulatory Authority</b></p>	<p><b>Media &amp;</b></p> <ul style="list-style-type: none"> <li>• The Authority's one function is to impart training and organize workshops to spread awareness about fake news or disinformation. This shall be taken as an opportunity as this aspect was still unattended in Pakistan.</li> <li>• Social Media platforms were unregulated in Pakistan due to non-existence of any law dealing with them. Now the Authority has been given mandate to enlist the Social Media Platforms. It is an opportunity which Pakistan can capitalize upon.</li> <li>• Th Authority has been given mandate to enter into agreements with its counterparts or other international agencies with regard to capacity building or learning or training regarding dealing with fake News or disinformation.</li> </ul>	<ul style="list-style-type: none"> <li>• The first and foremost important thing is to appoint person of unimpeac hable integrity and repute as the Chairpers on of the Authority. This will enhance public at large's trust in the Authority.</li> <li>• The social media shall be regulated in a way that it does not hurt the freedom of press or expression</li> <li>• The Authority shall engage with Internatio nal Factchecki ng Network and request them to impart trainings to Pakistan based journalists.</li> <li>• The Authority shall open its factchecki ng account on face book,</li> </ul>
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		twitter (X), Tik Tok etc. so that fake news or disinformation can immediately be countered.
<b>Social Media Complaint Council</b>	<ul style="list-style-type: none"> <li>• There was no specific council dealing with complaints regarding social media. PEMRA Council of Complaints was only meant for Electronic Media. So, the Council, under the newly enacted Act provides a forum to the aggrieved party to lodge complaint against the Social Media Platforms as well as accounts spreading false or fake news.</li> <li>• The Council's composition is blend of professionals as well as civil servants, thus, this opportunity shall be utilized by appointing impartial, honest and credible individuals.</li> <li>• The Council has been given ample powers.</li> </ul>	<ul style="list-style-type: none"> <li>• The Complaints against any handle or account regarding dissemination of fake news or disinformation shall be heard as per due process of law. The accused shall be given proper hearing. This will help the Authority dispel the impression that it is a tool in the hand of the government to muzzle critical voices.</li> <li>• Persons of impeccable integrity and repute be chosen as members of the Council.</li> </ul>
<b>Social Media Tribunal</b>	<ul style="list-style-type: none"> <li>• The Social media tribunal provides an opportunity to create deterrence</li> </ul>	<ul style="list-style-type: none"> <li>• As the time period is</li> </ul>

	<p>against the unabated spread of fake news or disinformation.</p> <ul style="list-style-type: none"> <li>The imposition of time limit of ninety (90) days for the disposal of case provides an opportunity for quick justice.</li> </ul>	<p>provided for the disposal of the case, the Tribunal shall strictly abide by that. Normally, laws do provide timelines for disposal of cases, however, due to workload as well as noncooperation of legal fraternity, the cases cannot be decided on time, thus, forums lose vitality. For this, the law shall be amended to empower the Tribunal to put cost if someone is found using delaying tactics or filing frivolous petitions.</p>
<b>National Cyber Crime Investigation Agency</b>	<ul style="list-style-type: none"> <li>As FIA was busy dealing with cases of multifarious nature, so, it was not possible for it to give due attention to the issue of fake News or disinformation. However, this new agency, under the newly enacted Act, provides an opportunity to mitigate the risks posed by the spread or</li> </ul>	<ul style="list-style-type: none"> <li>Be it FIA or Police, they fail to establish their cases before the tribunals or courts of law</li> </ul>

	<p>dissemination of fake news or disinformation.</p> <ul style="list-style-type: none"><li>• Though, recruitment of human resource for the new agency will be a herculean task but if it is done honestly and competent human resource is recruited, it will provide an opportunity to the agency to function well and achieve its goal.</li></ul>	<p>because of insufficient evidence and flawed prosecution. The National Cyber Crime Investigation Agency faces the same challenge. It can deliver if the human resource, at first instance, is recruited on merit, without political influence, and thereafter, the human resource is trained in evidence collection as well as presenting the same before the courts. For that the Authority shall hire services of experts to impart training to its human resource.</p> <ul style="list-style-type: none"><li>• The training regime developed for the agency shall also focus on public dealing as well.</li></ul>
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		Courteous attitude in public dealing will inspire trust and respect.
<b>Ministry of Information &amp; Broadcasting</b>	<ul style="list-style-type: none"> <li>Ministry of Information and Broadcasting shall launch awareness campaign and impart trainings regarding fact checking for journalists.</li> <li>Moreover, it shall address to the apprehensions of the journalists by explaining them that the new law is more about curbing fake news and disinformation and not about crackdown against journalists.</li> </ul>	<ul style="list-style-type: none"> <li>Ministry of Information &amp; Broadcasting shall persuade the media houses to impart fact-checking trainings to their beat reporters.</li> <li>The Ministry shall engage journalists and their associations to assure them the law will not be used as coercive measure but its purpose is to deal with fake news or disinformation alone.</li> <li>Ministry of Information &amp; Broadcasting shall take lead in countering this narrative that the new legislation is aimed to</li> </ul>

		target government's critics. One way to achieve this objective is to appoint credible journalists in the social media Regulatory Authority, Complaint Council and other forums.
<b>Pakistan Electronic Media Regulatory Authority</b>	<ul style="list-style-type: none"> <li>• Prior to 2023, the PEMRA law didn't provide definition of fake news or disinformation, thus, it was not in a position to take any action. However, in 2023, through an amendment, the fake news or disinformation was defined but it still could not take any action as social media was not in its ambit.</li> <li>• Now PEMRA can engage with the Social Media Regulatory Authority to take action against fake news or disinformation on social media and electronic media.</li> </ul>	<ul style="list-style-type: none"> <li>• PEMRA shall engage with media owners to ensure that they have fact-checking accounts wherein immediate response is provided to fake news. Some channels e.g. Geo News and Samaa News do run such fact checking accounts. Others shall also be convinced to start doing this.</li> <li>• Moreover, the Channels shall start a process</li> </ul>

		of self accountability too. The journalists who are found to be involved in spreading fake news or disinformation shall be taken to task by the organization itself.
<b>Ministry of Information Technology</b>	<ul style="list-style-type: none"> <li>• Provision of internet is the mandate of the Ministry and Internet Service Providers come within its ambit. It is the Ministry's responsibility to increase digital literacy so that the general public is able to differentiate, on social media, between fake news or disinformation and authentic news.</li> <li>• Secondly, the Ministry shall, utilizing the PECA (Amendment) Act, 2025, enter into training and technology related agreements or MoUs with other countries who have successfully dealt with information disorder or information pollution.</li> <li>• Ministry of Information &amp; Technology has made a lot of efforts, in the past, to bring social media platforms to Pakistan. However, it could not succeed. Now, the recently enacted law has a provision for enlistment of social media platforms. Thus, there is an opportunity for the Ministry to push social media platforms to open offices in Pakistan.</li> <li>• Pakistan suffered losses to the tune of \$1.62 Billion due to internet and social media outages (Ahmad, 2025). This has earned a lot of bad name and criticism to the Ministry as there was no legal backing to support the actions.</li> </ul>	<ul style="list-style-type: none"> <li>• The Ministry shall engage with Facebook, Twitter, Tik Tok, Whatsapp etc. to start digital literacy initiatives in Pakistan like other countries (Counterin g Disinform ation, 2021).</li> <li>• The Ministry should realise that slowing internet or blocking social media platforms is not helping.</li> </ul>
<b>Pakistan Telecommunication Authority</b>	<ul style="list-style-type: none"> <li>• The Pakistan Telecommunication Authority, in 2022, issued a booklet containing guidelines for social media</li> </ul>	<ul style="list-style-type: none"> <li>• The Pakistan Telecommunication</li> </ul>



	<p>security. Its amended version be issued and publicized.</p> <ul style="list-style-type: none"> <li>• It shall strictly enforce “the Removal and blocking of unlawful Online content (Procedure, oversight and safeguards) Rules, 2021.</li> <li>• It can collaborate with fact checking organizations such as Digital Rights Foundation and Soch fact to counter misinformation or fake news.</li> <li>• In September, 2023, PTA signed an MoU with Tik Tok to promote digital literacy and safety in schools across the country (Obaid, 2023).</li> <li>• The Pakistan Telecommunication Authority with the cooperation of Tik Tok launched a “<b>Digital Hifazat Contest</b>”. The purpose of this initiative is to increase awareness in the youth. Such initiatives can also be used to educate the youth about fake news or disinformation too (Dawn News, 2024).</li> </ul>	<p>Authority shall arrange campaigns with the help of social media platforms to create awareness among the general public about fake news and disinformation.</p> <ul style="list-style-type: none"> <li>• Awareness will help people understand that every news on social media or any other form of media is not correct unless corroborated, secondly, every news shared on the whatsapp or social media platform is not to be forwarded without verification.</li> <li>• The Pakistan Telecommunication Authority should propagate through radio and tv as what</li> </ul>
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		is Islamic perspective on fake news or disinformation.
<b>Federal Investigation Agency</b>	<ul style="list-style-type: none"> <li>As the subject of fake news or disinformation will, henceforth, be dealt by new agency, thus, it provides an opportunity to the Federal Investigation Agency to share its understanding, knowledge and expertise with it so that fake news or disinformation is dealt effectively.</li> </ul>	<ul style="list-style-type: none"> <li>The officials of cyber crime wing and prosecutors shall share their experience and expertise with the officials of the Social Media Regulatory Authority. This will help in understanding the challenges faced during investigation and prosecution.</li> </ul>
<b>Courts</b>	<ul style="list-style-type: none"> <li>The PECA (Amendment) Act, 2025, provides for the specialized Tribunal to deal with cases related to the unlawful content or disinformation and fake news. The time period, for disposal of the complaint, has been fixed as ninety (90) days. It will lessen the burden of cases on the courts. However, the courts shall focus on deciding cases related to libel and defamation. If the defamation cases are decided on merit and at the earliest, there will be no need to criminalize fake news or disinformation.</li> </ul>	As the new forum has been created to deal with the cases under the PECA Act, the Courts shall divert its energies on deciding the pending cases of civil nature with respect to fake news or disinformation e.g. cases of defamation and libel. In all developed countries, the spread of fake news or disinformation

		is difficult because there is a threat of damages (Bennett-Jones, 2016).
<b>Editorial Boards</b>	<ul style="list-style-type: none"> <li>• Confirmation from multiple sources before publication of stories.</li> <li>• The Editorial Boards shall establish a section wherein corrections and clarifications are marked. This will not only check fake news but also provide data regarding misinformation so that reasons can be traced and analyzed.</li> <li>• Penalty for intentional spreading fake news or disinformation.</li> <li>• For live telecast, the PEMRA guidelines regarding the time interval shall be strictly adhered to.</li> </ul>	A policy of self-regulation and correction. Improving the filters before a story is published or a news is on-air.
<b>Social Media Platforms</b>	<ul style="list-style-type: none"> <li>• Collaboration with Pakistan authorities to curb dissemination of fake news or disinformation. It will also enhance credibility of the social media platforms that they are not contributing to social unrest or violence or disorder which comes as consequence of fake news.</li> <li>• The PECA (Amendment) Act, 2025 provides for a provision to enlist the social media platforms. It is an opportunity for the platforms to open offices in Pakistan.</li> </ul>	<ul style="list-style-type: none"> <li>• The Social Media Platforms shall, by use of AI, establish a filter against the fake news or disinformation.</li> <li>• The proponents of fake news or disinformation get encouraged when despite complaints, their accounts remain active. The Social Media Platform shall suspend such accounts permanently.</li> <li>• Creation of dummy or fake</li> </ul>

		accounts and using them for spreading fake news is a problem. The social media platform shall develop some policy to plug this loophole.
<b>ISPR</b>	<ul style="list-style-type: none"> <li>Rs. 2 billion has recently been approved by the Economic Coordination Committee for ISPR to curb fake news or disinformation regarding state institutions. It provides an opportunity to ISPR to utilize this money appropriately to curb fake news or disinformation.</li> <li>The recent initiative of ISPR to engage university students is a step in the right direction.</li> </ul>	<ul style="list-style-type: none"> <li>The ISPR shall hire experts to make a soft strategy to deal with fake news or disinformation.</li> <li>The law does provide for three (3) years sentence but it will also trigger a reaction in the form of protests from journalists and human rights organizations. The better way is to develop soft strategy i.e. factchecking initiatives, increasing digital literacy,</li> </ul>

		imparting trainings to the journalists and, like some countries, introducing skills to differentiate between fake news and authentic news in the schools' curriculum.
<b>Organizations</b>	<b>Threats</b>	<b>Hedging against the threats</b>
<b>Ministries of Information &amp; Broadcasting and Information Technology &amp; Telecommunication</b>	<ul style="list-style-type: none"> <li>The Ministries have not been able to curb fake news and disinformation, therefore, the government has enacted the Prevention of Electronic Crimes (Amendment) Act, 2025. The abysmal performance of the Ministries itself is the biggest threat to their existence.</li> <li>The Ministry of Information and Technology with the support of some government organizations installed firewall project, however, due to that project, Pakistan is witnessing frequent outages of internet. These outages or slow speed of the Internet is a threat to the economy in general and to freelancers and Information Technology Sector in particular.</li> <li>Ministry of Information and Broadcasting's could not play an effective role to develop a consensus among journalistic bodies for a legislation to curb fake news. Due to this reason, the PECA (Amendment) Act, 2025 is receiving huge criticism. Even international bodies such as Amnesty International are critical of the new legislation (Amnesty International, 2025). This local and international criticism is a threat to the new strategy to counter fake news or disinformation,</li> </ul>	<p>The Ministries of Information &amp; Broadcasting and IT &amp; Telecommunication shall adopt for following techniques;</p> <ol style="list-style-type: none"> <li>1. Use of Natural Language Processing</li> <li>2. Machine Learning Tools</li> <li>3. Network Analysis</li> <li>4. Fact-Checking with AI</li> <li>5. Semantic Analy</li> </ol>

		sis Tools
<b>Social Media Protection &amp; Regulatory Authority, Social Media Complaint Council and National Cyber Crime Investigation Agency</b>	<p><b>Political Threats</b> All the three forums are creation of the Prevention of Electronic Crimes (Amendment) Act, 2025. The Act has been passed by the Government without developing consensus among all political parties (Chaudry, 2025). For this reason, the opposition parties have expressed strong concerns on this legislation. Thus, the threat to these forums is their longevity. Any new government can abolish these forums by introducing amendments. Secondly, the local and international media community is strongly criticizing these forums, thus, developing a public opinion that the PECA (Amendment), 2025 is less about curbing fake news or disinformation and more about silencing and punishing critical voices.</p> <p><b>Legal Threats</b> As these forums have been created without developing a consensus, therefore, there is a threat that the associations and bodies of journalists, civil society and political parties approach the High Courts and Supreme Court. A single restraining order from any court will throw spanner in the wheel. Thus, these forums face legal threats too.</p> <p><b>Institutional Threats</b> The forums introduced by the new amendments are new. They do not have experienced manpower. For instance, National Cyber Crime Investigation Agency will recruit new human resource. Thereafter, training will be imparted to the newly recruited officials. This will take considerable time. On the other hand, the targets set for the agency are ambitious. As the Cyber Crime Wing of the Federal Investigation Agency has also been abolished, therefore, those officials will also attempt that the agency does not succeed in achieving its goals. The amendments vest controlling powers in the federal government in appointment and removal, which will damage the credibility and impartiality of all these forums.</p> <p><b>Narrative Threats</b></p>	<p><b>Political &amp; Legal Fronts</b> On political front, the only option is to develop the consensus between all parties. Though, these forums have been created but the government shall form a Parliamentary Committee consisting of members from all political parties with terms of reference to propose amendments. Such consensus-based document will ensure creation of permanent institutions.</p> <p>On legal front, the Ministry of Law &amp; Justice and Attorney General Office shall vigorously contest the cases against the PECA (Amendment) Act, 2025 in the Courts and explain as why these forums were required.</p> <p><b>Institutional &amp; Narrative Threats</b></p> <ul style="list-style-type: none"> <li>• The officials of integrity,</li> </ul>

	<p>A narrative has been coined that the new forums are politically motivated. As the government is unable to counter narrative a political party, therefore, it has established all these forums, so that, in the garb of curbing fake news or disinformation, the social media activists of that political party will be targeted. The journalists have built a narrative that the forums have been created to curtail the freedom of press and punish those media persons who do not toe the line of the government.</p>	<p>repute and competence in the FIA Cyber Crime Wing be merged into the New Agency.</p> <ul style="list-style-type: none"> <li>• The Chairpersons and members of the forums shall be such persons who invite confidence of media, civil society as well as opposition. The government shall avoid appointing compromised or biased persons in these forums. Appointment of credible persons will counter all propaganda.</li> <li>• Ministry of Information &amp; Broadcasting shall counter the narrative by explaining that the forums are not against</li> </ul>
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		the press freedom or to silence journalists.
<b>Social Media Tribunal</b>	<p><b>Legal Threat</b> The tribunal faces following legal threats; firstly a parallel court has been created, secondly, the appointment, like in other tribunals, in the tribunal is not with the consultation of the judiciary and thirdly, high court has been removed from being appellate body. Forgoing in view, the Supreme Court or High Courts will intervene to review the creation of the Tribunal</p> <p><b>Narrative Threat</b> As a perception has already been developed that the PECA (Amendment), 2025 and the forums, created therein, are politically motivated, therefore, the Tribunal, even prior to its inception, faces a credibility and legitimacy threat.</p>	<ul style="list-style-type: none"> <li>• The law shall be amended to incorporate the concerned High Court as the first appellate forum.</li> <li>• Moreover, there shall be a code of conduct for members of the Social Media Tribunal.</li> <li>• Lastly, in a highly politically charged environment, it will be in the Government's interest to appoint chairperson and members of the Tribunal in consultation with the Chief Justice of Pakistan.</li> </ul>
<b>Social Media Platforms</b>	<p><b>Threat from Government</b> The social media platforms face threats of the government's coercion to remove a content or block the accounts. They will be compelled to enlist themselves with the Social Media Protection &amp; Regulatory Authority.</p> <p><b>Threats of Fines / Penalties</b> There is a threat of penalty / fines. There is a threat that the platforms, in order to</p>	<ul style="list-style-type: none"> <li>• The Social Media Platforms shall, in coordination with Pakistan's authorities, develop such tools</li> </ul>



	<p>survive, will have to compromise on their policy of ensuring freedom of expression.</p>	<p>wherein the fake news or disinformation is filtered.</p> <ul style="list-style-type: none"><li>• The accounts involved in disseminating fake news or disinformation shall be blocked.</li><li>• It has been observed that a lot of fake accounts, in the name of prominent personalities, are being operated. For example, a prominent journalist Ayaz Amir has, on several occasions, denied that he does not have an account on X or Twitter, nevertheless, an account on his name is, continuously, spreading fake news or disinformation.</li></ul>
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<b>Editorial Boards</b>	<b>Threat of Censorship</b> The editorial boards face a threat of self-censorship to avoid prosecution and punishment under the PECA (Amendment) Act, 2025. They will be pushed to follow the government's policy.	<ul style="list-style-type: none"> <li>• In order to avert the threat of punishment or incarceration, the Editorial Boards shall introduce strong controls to filter fake news or disinformation.</li> <li>• The Editorial Boards of media houses shall also include a person having legal background.</li> </ul>
<b>Pakistan Telecommunication Authority &amp; Federal Investigation Agency</b>	The PTA and FIA are facing existential threats as their role has been minimized with the introduction of the Prevention of Electronic Crime (Amendments) Act, 2025. Now the lead role will be assumed by the Social Media Protection & Regulatory Authority and National Cyber Crime Investigation Agency. The government has already decided to dissolve the Cyber Crime Wing of the FIA.	FIA & PTA shall extend assistance to the new forums by sharing their experiences and strategies. They shall share the reasons of their failure to curb fake news or disinformation so that the new forums shall learn.

### *Legal Analysis*

#### *The Prevention of Electronic Crimes (Amendment) Act, 2025*

On January 29<sup>th</sup>, 2025 the federal government, after approval from both houses of the Parliament and assent of the President, notified the Prevention of Electronic Crimes Act, 2025.

In the definition clause of the Act, the expression “aspersions” has been defined as spreading false information which damages reputation of any person. The definition of expression “aspersion” is too vague and does not cater for fake news or disinformation alone. The reputation of a person can be hurt by an authentic or credible news too. For instance, the news story on Panama Leaks hurt the reputation of the former Prime Minister and his family, so, will that be covered under the expression “aspersions”? Similarly, the news story mentioning names of the political personalities and officers who have taken gifts from foreign dignitaries, under the Tosha Khana rules, may be damaging for the reputation of those persons but same is correct as per the Cabinet Division’s record so will that also come under the definition of the expression “aspersions”? The editorials or opinions published in the newspapers explaining that certain institutions are acting beyond their legal mandate may hurt their reputation but if same is factually correct then how will that be covered by the expression “aspersions”?

The Social Media Protection and Regulatory Authority conceived by the PECA (Amendment) Act, 2025 suffers from lack of autonomy and independence as the powers to appoint the Chairperson and members rest with the Federal Government. Moreover, the Federal Government has been empowered to remove the Chairperson and members. Furthermore, the Federal Government also has the powers to issue policy directions and those directions will be binding on the Authority. The Chairperson has been given dictatorial powers regarding issuance directions for removal of content within twenty-four (24) hours and later seek the confirmation of the other members of Authority. How will he reach to the conclusion within twenty-four (24) hours, without a formal inquiry, as whether an information is fake or otherwise, has not been explained in the law. The task of enlistment of the Social Media Platforms is a step forward in the right direction, however, no mechanism has been explained as how will the Authority implement it. The Authority has been empowered to issue directions to the Social Media Platforms regarding removal of the contents, however, how will it enforce the directions has not been explained in the Act. Moreover, there is a duplicity as the same role is also performed by the Pakistan Telecommunication Authority under the Removal and Blocking of Unlawful Online Content (Procedure, Oversight and Safeguards) Rules, 2020. The enlistment also means localization of data storage which may have the consequences that the government authorities, with or without warrants from the court, can seize the data of individuals by raiding the offices of the social media platforms. The provision of enlistment of the Social Media Platforms was also envisaged in previous laws too, however, it never got implemented. For instance, in terms of rule 5 of the Citizens Protection (against online harm) Rules, 2020 (Telecommunication, 2020), the Social Media Platforms were directed to register with the Authority, establish permanent office in Pakistan and appoint a local representative within three (03) months, however, this could not be implemented. Similarly, in terms of rule 6 read with rule 7 of the rules *ibid*, the Social Media Platforms were bound to share information with Pakistan Authorities and in case they failure to do so, they shall be banned. However, nothing could be done. In the Rules *ibid*. office of National Coordinator was also envisaged.

Another entity envisaged under the Prevention of Electronic Crimes (Amendment) Act, 2025 is the Social Media Complaint Council.

The Council also suffers from lack of autonomy as the Chairperson and members will be appointed by the Federal Government. Similarly, the Federal Government has the powers to remove the Chairperson or members. Moreover, the law provides that the Chairperson or members of the Council, after finishing their tenure, can be appointed for a similar term. This clause makes the Chairperson and members susceptible to appeasing the government under expectation of extension in tenure.

The Prevention of Electronic Crimes (Amendment) Act, 2025 also mentions establishment of the Social Media Protection Tribunals. The Federal Government, again, is empowered to appoint and remove the Chairperson and members of the Tribunal which will have serious implications on the working of the Tribunals. The law provides that the Tribunals have to decide cases within ninety (90) days which is a positive aspect of the new legislation. However, for appointing chairperson and members of the Tribunal, the concept of consultation with the Chief Justice of Pakistan, has been ignored. Even for appointment of members, who are serving officers of Inland Revenue Service, in Appellate Tribunals Inland Revenue, the Ministry of Law and Justice consults the Chief Justice of Pakistan and same is the case with other tribunals. Furthermore, the law has removed the jurisdiction of the concerned high courts to review the decisions of the Tribunal as the Supreme Court has been mentioned as the Appellate Authority. This may invite further controversy for the Supreme Court of Pakistan as the critics will propagate that the Constitutional Bench of the Supreme Court is deliberately made appellate forum. There is no mention in the Act as if the Tribunal enjoys the powers of Civil or Criminal Court for the purpose of conducting its proceedings.

The Act has prescribed up to three years sentence or up to two (02) million fine or both for spreading aspersions or unlawful content. The criminalizing fake news or disinformation or unlawful content will have various impacts; firstly, it will suppress freedom of expression, secondly, critical voices will be prosecuted, thirdly, it will increase self-censorship and lastly, on failure to prosecute social media platforms, due to their strength and influence, ultimately, the users of platforms will face the wrath of authorities.

The portion of the Act that prohibits broadcasting the proceedings of National Assembly and Senate declared by the Chair to be expunged, is superfluous. Lastly, the Act proposes for establishment of National Cyber Crime Investigation Agency to be headed by the Director General. As soon as this Agency comes into existence, the Cyber Crime Wing will be abolished. Moreover, the Federal Government has been vested with the powers to appoint the Director General of the Agency for a non-extendable period of three (03) years. However, there is no explanation, so far, from the Government as how will the new agency be more effective than FIA & PTA to curb fake news and disinformation. If any diagnostic analysis has been carried out to study the defects in the working of FIA or PTA, same has not been shared. The Agency has been empowered to create its own digital forensic laboratory and its reports have been given legal protection. It is a positive aspect of this law. However, no punishment has prescribed in the law if any officer or official of the agency is found misusing his powers.

### *The Punjab Defamation Act, 2024*

The Punjab Government, in May 2024, notified the Punjab Defamation Act, 2024 (Punjab, 2024) wherein the defamation caused by fake news or disinformation has been termed as a civil wrong and the aggrieved person is provided with a remedy to file suit for damages before a Tribunal to be constituted under the Act. One strength of this Act is that the Tribunal is to be constituted by the Punjab government in consultation with the Chief Justice of the Lahore High Court. Another strength is that the Tribunal is to decide the case within one hundred and eighty (180) days. Moreover, the government is empowered to constitute as many Tribunals as it deems appropriate. The aggrieved party can file appeal in the Lahore High Court against the decision of the Tribunal. The chairperson of the Tribunal cannot be removed without prior consultation of the Chief Justice of the Lahore High Court. The Tribunal has been given powers to direct the defendant to tender unconditional apology, publish the same from his social media handle or account and also direct the concerned regulatory authority to block the account. The Tribunal has been vested with powers to order punitive damages against frivolous complaints. For the purpose of proceedings under this Act, the Tribunal has been conferred powers of the Civil Court. The Lahore High Court has been provided as an Appellate forum.

#### Shortcomings of the Act

There are certain deficiencies in this Act. The first and foremost shortcoming is that the law has been passed without consultation of the stakeholders i.e. Journalists and opposition parties (Tariq, 2024). Secondly, the clause related to reviewing the performance of the Tribunal, after eighteen months, by the Review Committee is against the principle of judicial autonomy and independence. Thirdly, in terms of section 13 of the Act, if a case has been instituted by an aggrieved party and summons have been served on the defendant, the defendant will not be able to defend his case unless a leave to defend is granted by the Tribunal. In case, the defendant is unable to get leave to defend, it will be considered that allegations against him are proven or established. The Tribunal, in this scenario, shall pass preliminary decree for general damages against the defendant. After the preliminary decree, the Tribunal shall fix the case again to know whether the claimant wants to pursue a case for further damages, up and above the general damages already awarded in his favor. In case the claimant is interested in pursuing the case for further damages, the Tribunal shall proceed with the case and decide the matter. This provision of the Act is conflicting with the fundamental principle of due process of law, principle of *audi alterem partem* as well as article 4, 8 and 25 of the Constitution of the Islamic Republic of Pakistan. Further, this creates apprehensions in journalists and social media activists that the intention of the legislation is to screw them. Section 17 of the Act is also anomalous as it states that the Claimant needs not to prove his reputation rather it shall be sufficient if he proves any damage, over and above the general damages to his reputation. As per section 23 of the Act, Qanoon-e-Sahadat shall not apply on the proceedings before the Tribunal. In such scenario, how will the evidence be recorded and examined? Another discriminatory provision of this law is affording exclusive facility to the Constitutional Office holders to appear through their attorneys or councils, while, common litigants need to appear in person.

The Constitution office holders, for the purpose of this Act, have been defined as the President, the Prime Minister, the Chief Justice of Pakistan, Speaker of Provincial Assemblies etc. This question remains unanswered as how a provincial statute extends remedies for Speakers of other provincial assemblies as well as office bearers of the Federal Government. The act tries to curtail fair comment on the proceedings pending before the tribunal by imposing fine up to Rs. 50, 000 on any person doing so. The media outlets, civil society members, human rights organizations and political parties termed this law as an attempt to control free press and freedom of speech (Ali K. , Dawn Newspaper, 2024).

***The Pakistan Electronic Media Regulatory Authority (Amendment) Act, 2023***

The Pakistan Electronic Media Regulatory Authority (Amendment) Act, 2023 was notified by the Federal Government, after passage from both houses of the Parliament and assent of the President, on 17<sup>th</sup> August, 2023. Earlier, the PEMRA Ordinance did not provide definition of disinformation or fake news. By this Act, the disinformation was defined as verifiable false, misleading, manipulated, created or fabricated information which is disseminated or shared with the intention to cause harm to the reputation of or to harass any person for political, personal, or financial interest or gains without making an effort to get other person's point of view or not giving it proper coverage and space but does not include misinformation (Tahir Hussain, 2023). Similarly, the term misinformation has been defined as verifiable false content or information that is unintentionally disseminated or shared. By this Act, the process for appointment of Chairman PEMRA was made more transparent i.e. through a Parliamentary Committee having equal representation of the Government and Opposition. The Ministry of Information and Broadcasting was made responsible for sending a panel of five eligible candidates to a Parliamentary Committee consisting of four members, two from the National Assembly and two from the Senate.

***Establishment Division's Office Memorandum dated 2<sup>nd</sup> September, 2024***

On September 2<sup>nd</sup>, 2024, the Establishment Division, Government of Pakistan issued an office memorandum no. F. No. 14/3/2022-D-II on the subject Use of Social Media Platforms by the Government Servants (Establishment Division, 2024). In this memorandum, the Establishment Division reiterated the instructions contained in the Conduct Rules, 1964. No civil servant can participate in a media program or write for a newspaper without prior permission of the Government. Moreover, in terms of rule 18 of the Rules *ibid*, the Civil Servants are barred from sharing information with an unauthorized person. In terms of rule 22 of the Rules *ibid*., the Civil Servants shall not make any statement which invite embarrassment for the government. In terms of rule 21 read with rule 25 and 25 A of the Rules *ibid*, the Civil Servants shall avoid from expressing views against the ideology of Pakistan, policies of the government or relations with a friendly country. The Establishment Division's OM observed that despite clear instructions, the Civil Servants have been found offering views on host of subjects on social media platforms such as Facebook, Instagram, Twitter etc. The Establishment Division directed the Civil Servants to avoid following trends related to political parties. It also directed the Civil Servants to maintain impartiality by not indulging in any political discussion or forwarding or sharing political views.

The Civil Servants shall not disseminate any information especially pertaining to the government matters which appears fake or misleading. However, the Establishment Division did not discourage the use of social media by the Civil Servants for improving public service delivery or showcasing the government initiatives or inviting public feedback.

### *PESTLE Analysis*

- Political Analysis:** The legislations and initiatives to curb fake news or disinformation are damaging the political capital of ruling party and its allies. The recently notified the Prevention of Electronic Crimes (Amendment) Act, 2025 is inviting criticism from opposition parties, human rights organizations, associations of prints & electronic journalists as well as digital rights activists. The ruling alliance did not do exhaustive consultations with all stakeholders before introducing such an important piece of legislation in the Parliament. When the draft bill was referred to the Committees of the Senate and the National Assembly, the views expressed by the opposition law makers as well as media representatives were not incorporated. The Prevention of Electronic Crimes Act, 2016 was also legislated during the then Government of PML-N, however, later on, while in opposition, it faced the brunt. The provisions of the recently legislated Act, though are aimed at curbing fake news, disinformation and unlawful content, however, it will muzzle freedom of expression. The primary purpose seems to silence the critics. Freedom of press is fundamental pillar of a thriving democracy as free press not only keeps an eye on the government's action but also stands with democracy against undemocratic forces. Similarly, the strategy to ban access to Twitter or X also brought embarrassment for the government. On one side, the Twitter or X is ban, while, on the other side, important government functionaries have been seen using it, by VPN, to propagate the government policies or actions. When the matter was taken up by the different High Courts, the statement of the concerned government officials before the courts also brought embarrassment as none could explain as why was the social media platform banned. The strategy to slowdown internet has also backfired and brought ridicule for the Ministry of Information and Technology besides extending economic losses to the country. The provision of criminalizing fake news or disinformation is being criticized by even those journalists as well who are, otherwise, considered pro-government.
- Economic Analysis:** There is no doubt that disinformation or fake news causes chaos and uncertainty which are disastrous for economic development. However, the government's recent strategies such as installation of firewall, banning social media platforms, slowing down internet speed and introducing the Prevention of Electronic Crimes (Amendment) Act, 2025 are also equally harmful for the economy of the country. As per report released by Top10VPN.com, Pakistan led the world in terms of financial losses suffered as a result of outages and shutdowns of internet and social media last year. Pakistan topped the chart with cumulative effect of \$1.62 billion (Malik, 2025). The strategies to curb fake news and disinformation such as slowing down speed of internet or installation of firewall are proving destructive for freelancers too.

- Pakistan-based freelancers contributed foreign exchange earnings to Pakistan's economy through remittances of US\$ 350.15m million during FY2024 (July-March) (Finance, Pakistan Economic Survey 2023-24, 2024). Mr. Olof Skoog, the Human Rights representative of the European Union urged the government not to introduce legislations to curtail freedom of press. He further said that the fate of GSP Plus status depends on how does the government comply with the international obligations (Komal, 2025). These measures have consequences for GSP Plus status too, which is crucial for exports to the EU countries.
- **Social Analysis:** The fake news or disinformation, no doubt, has disturbed social cohesion. But, the measures or initiatives, adopted by the government, to curtail fake news or disinformation are not beneficial for the society either. Banning social media platforms, introducing strict laws and installation of firewall are discrediting the political government in the general public and creating social resentment. A democratic and progressive society flourishes on freedom of information and expression. One reason for penetration of fake news or disinformation is the undue control, exercised by the government, on free flow of information because the general public is under the impression that whatever comes from the government is a propaganda. The journalists, who once enjoyed public approval, when aligned themselves with the government, lost public ratings. Moreover, curtailing free flow of information triggers the curiosity in human beings and, in order, to satisfy their curiosity they search different platforms and believe in the content displayed therein. Though, the government has restricted the access to X, yet, a lot many are using it by VPN. The better strategy for the government is to create awareness and improve digital literacy so that people are able to distinguish between fake news and authentic news. Difference of opinion, in a progressive society, is encouraged and not suppressed. Tactics such as arrest and incarceration develop a sympathy for the social media activist or journalist and his viewership increases. For instance, the viewership of Imran Riaz, Matiullah Jan and Asad Toor increased on YouTube channel increased after their arrest. Thus, arrest or imprisonment is never productive to handle fake news or disinformation. Ban on Social Media Platforms e.g. Twitter or X or slowing down Internet can prove counterproductive as public does not know from where to verify the facts. (Baig, Dawn Newspaper, 2024).
- **Technological Analysis:** The IT industry in Pakistan currently generates an annual export of around US\$ 2.6 billion (Finance, Pakistan Economic Survey 2023-24, 2024). The Prime Minister wants to boost the IT Exports to US \$ 25 Billion (The Nation, 2024). However, the initiatives or strategies used by the Government to curb fake news or disinformation have serious repercussions for the IT sector. The IT industry, ecommerce and freelancing is suffering due to such internet outages. Pakistan's IT sector faces \$ US 1 million loss per hour due to internet slow down (Fida, 2024). Due to this reason Pakistan's IT companies are shifting their business to Dubai. The Dubai Chamber of Commerce witnessed 3,968 Pakistani companies registered in the last six-month period, which is a 17% increase when compared with the figure of 3,395 in the same period (January-June) of 2023 (Ali F. , 2024). Therefore, the government needs to revisit its policies related to slowing down internet or installation of firewall for economic progress of the country.



- **Legal Analysis:** The Federal Government, after approval of the both houses of the Parliament and assent of the President, has notified the Prevention of Electronic Crimes (Amendment) Act. 2025. This legislation is aimed to curb fake news or disinformation. New forums such as Social Media Protection and Regulatory Authority, Social Media Complaint Council, Social Media Tribunal and National Cyber Crime Investigation Agency have been created. The fake news or disinformation has been criminalized with a fine of Rs. Two (2) million or sentence of three (3) years or with both. The Social Media Platforms have been directed to enlist with the Authority. However, almost similar clauses were mentioned in the previous Acts too. The fundamental problem is of implementation. How will the Social Media Protection and Regulatory Authority push giants like YouTube, X, Instagram, Facebook etc. to get enlisted or open their offices in Pakistan? Moreover, the members of civil society, digital rights activists, political activists and media persons will challenge this new legislation in the court of law by calling it conflicting with Article 19 of the Constitution of the Islamic Republic of Pakistan. One petition has already been filed in the Lahore High Court challenging the Act.
- **Environmental Analysis:** The Nongovernmental Organizations have criticized the Prevention of Electronic Crimes (Amendment) Act, 2025 calling it an attempt to prosecute journalists and eradicate freedom of expression. are against the legislation or initiatives curbing fake news and disinformation. The Human Rights Commission of Pakistan (The News International, 2025), Reporters without borders and Amnesty International have unanimously criticized this new legislation. The Digital Rights activists are also criticizing the new legislation. Pakistan, already, does not enjoy good ranking as far as protection of human rights and freedom of speech are concerned. These strategies and laws will further downgrade its rankings and may have severe consequences for the economy too.

### *Case Studies*

#### *Asma Shirazi Versus Council of Complaints through Secretary, and others*

The facts are that on 19.01.2022, the Supreme Court's three-member bench was hearing a suo motto case titled "**Suo Motu action regarding highhandedness of journalists by FIA action pursuant to FIR No.127/2021 and FIR No.128/2021 lodged at Cyber Crime Wing Lahore**". During the hearing of the case, the then Attorney General submitted that some social media platforms were being used to malign private citizens. The Attorney General also referred to a Vlog wherein the nomination of the new Prime Minister of Azad Jammu & Kashmir was associated with the then first lady's belief in supernatural forces. Upon this, one of the members of the bench remarked that such Vlogs were utterly disgraceful and had that been on-aired in the UK, the Vlogger would have been subjected to hefty fine. After the proceedings of the Court, the ARY Digital reported the judges' remarks by placing picture of Ms. Asma Shirazi alongside news bulletin, thus, making the viewers believe that the courts remarks were against her.

Ms. Asma Shirazi filed a complaint against ARY News in the PEMRA Council of Complaints, however, that was turned down as being not maintainable. She, thereafter, assailed the orders of the Council of Complaint dated 21.12.2022 in the Islamabad High Court. Her case, in the Islamabad High Court was heard by Justice Mohsin Akhtar Kiyani. The Islamabad High Court, after giving hearing to Ms. Asma Shirazi and the counsel of ARY News, awarded damages of Rs.50,000 as well as directed ARY News to broadcast an apology for their action and for clarity of general public. The Court also observed that Ms. Asma Shirazi can also approach the competent court under the defamation law as well.

### *Additional Deputy Commissioner (General) Islamabad Versus Tayyab Gondal*

During the course of study, an interview was conducted of Mr. Muhammad Atif Kokhar, Advocate Supreme Court of Pakistan. He contested a defamation suit, in 2022, on behalf Rana Waqas, the then Additional Deputy Commissioner, Islamabad Capital Territory against a YouTuber namely Tayyab Gondal. The facts of the case were that Mr. Tayyab Gondal through his YouTube channel on-aired a video whereby he alleged that the Additional Deputy Commissioner (General), in his capacity as Additional District Magistrate, was not taking action against the massage centers in sector E-11, Islamabad due to bribe and fleecing. He, thereafter, uploaded this video from his Facebook page as well. On knowing about the videos, the then Additional Deputy Commissioner engaged Mr. Muhammad Atif Kokhar for filing a defamation suit, in the Islamabad District Courts, against Mr. Tayyab Gondal for malicious and fake news to hurt his reputation. The matter was heard in the District Courts, under the Defamation Ordinance, 2002, evidence was recorded and the Court reached to the conclusion that Mr. Tayyab Gondal concocted fake and fabricated story to defame the then Additional Deputy Commissioner, ICT, Islamabad. Consequently, Additional District and Sessions Judge Mr. Mehmood Ahmad Jasra ordered Mr. Tayyab Gondal to pay one (1) million as damages to the petitioner. I inquired from Mr. Muhammad Atif Kokhar, Advocate Supreme Court of Pakistan as if damages were ever paid by the defendant? He informed that an appeal was filed by the defendant in the Islamabad High Court which was still pending.

### *Core Research Outcomes & Policy Challenges*

- The stakeholders have not been consulted while drafting legal regime and conceiving strategies to counter fake news or disinformation. The Prevention of Electronic Crime (Amendment) Act, 2025 was rushed through the Parliament and its Committees. Neither any debate took place nor views were invited from the opposition or working journalists. With opposition and media workers agitating on the recent legislation, its implementation will become difficult.
- The definition of “aspersion” has been deliberately kept vague so as to apply it against the critics or political workers or individuals having opposing point of view. With such a vague definition, a judicial implementation of policy is a challenge.

- Though, the law provides for establishment of new forums, to deal with fake news or disinformation, such as Social Media Protection and Regulatory Authority, Social Media Complaint Council, Social Media Protection Tribunal and National Cyber Crimes Investigation Agency, yet, the Government has the exclusive powers to appoint their chairpersons and members. This creates an impression that the new forums will serve the agenda of the government. And as the Government has the power to remove the chairpersons and members of the new forums, the impartiality or autonomy of the new forums becomes doubtful.
- There are two diverse approaches to deal with fake news or disinformation; one is to consider it as civil wrong and devise strategy accordingly, while, the other is to declare it criminal act and prepare strategy accordingly. In the Punjab Government's Defamation Act, 2024, the fake news or disinformation has been treated as civil wrong, while, in the Prevention of Electronic Crimes (Amendment) Act, 2025, it has been treated as a criminal offence having punishment of imprisonment up to three (03) years or fine up to two (02) million or with both. In the developed countries like United Kingdom, fake news is treated as civil wrong which invites damages.
- As the policies are hurriedly conceived without proper analysis, therefore, the targets set therein are, often, unrealistic. Same has happened with the Prevention of Electronic Crimes (Amendment) Act, 2025. The targets such as enlisting of social media platforms, pushing them to open offices in Pakistan and issuing directions to remove the unlawful content are unrealistic, therefore, difficult to achieve.
- The Punjab Defamation Act, 2024 has a positive aspect of appointing the Chairperson of the Tribunal with the consultation of the Chief Justice of the Lahore High Court. However, the Prevention of Electronic Crimes (Amendment) Act does not take into account consultation with the Chief Justice of Pakistan for appointing the Chairperson. Similarly, the Punjab Defamation Act, 2024 provides for removal of the Chairperson of the Tribunal with the consultation of the Chief Justice, however, in the case of the Prevention of the Electronic Crimes (Amendment) Act, 2025, no such thing is mentioned.
- The law does not mention as whether the Social Media Protection Tribunal will have the powers of the Civil Court or Criminal Court while conducting proceedings. It also removes oversight of the High Courts by making the Supreme Court as the Appellate Authority. Similarly, the Punjab Defamation Act mentions that Evidence Act or Qanoon-e-Shahdat will not be applicable during proceedings before the Tribunals. These anomalies need to be addressed.
- Pakistan has a Defamation law, however, its implementation is weak. It seems beyond comprehension that instead of improving implementation of Defamation or libel or slander Law and accelerating the working of the Courts, the preference of the government is to establish more authorities and forums.
- The Government strategies are not focused on initiatives of improving digital literacy, creating awareness, negotiating MoUs with International Fact Checking Networks or using Artificial Intelligence to counter fake news or disinformation.

### ***Proposed Change in the Policy to Curb Fake News and its intended Outcomes***

The new policy to curb fake news or disinformation shall have following contours or components:

- i. The new policy shall treat fake news or disinformation as a Civil Wrong and not a Criminal offence. The act of dissemination of fake news or disinformation shall invite damages on the proponent. Arresting YouTubers or Vloggers increase their viewership and bring bad name for the government.
- ii. There shall be a clear definition of fake news or disinformation e.g. an intentional act of conceiving or spreading malicious and baseless information with an intention to damage someone's reputation.
- iii. In case of creation of Social Media Regulatory Authority or Complaint Council, the powers to appoint its Chairperson and members shall not be with the Government, rather it shall be with the Parliamentary Committee.
- iv. The Chief Justice of Pakistan be requested to appoint a serving judge of the High Court to act as chairperson of the Social Media Tribunal. This will secure public trust as High Court's serving judge is by no means subordinate to the political executive.
- v. The new policy shall include strengthening of Defamation, Slander and Libel laws. The defamation suits be decided within three (03) months. If laws of Defamation and Libel are implemented and enforced in true letter and spirit, there will be no need of separate tribunals etc.
- vi. The Policy shall make it mandatory on the TV Channels to start fact checking initiatives. Some news channels do run fact check twitter handles where they report about the authenticity or falsity of any news, however, every channel shall do that.
- vii. The Policy shall include MoUs with International Fact Checking Networks to impart training to Pakistani Journalists, particularly reporters, and officials of Ministry of Information and Broadcasting.
- viii. The Policy shall also include awareness campaigns in the Universities and Colleges to educate the youth as how to differentiate between fake news or disinformation and authentic news.
- ix. The Policy shall aim at regulating Vloggers on YouTube as a lot of complaints come against them for spreading fake news or disinformation. The thumbnails used in their Vlogs are so sensational that people are attracted to watch their channels. Most often, it happens that the content of the Vlog is altogether different from the thumbnail used.
- x. The policy shall maintain a fine balance between regulating fake news or disinformation and not restricting or limiting freedom of expression or free press.
- xi. The Policy shall be focusing upon use of Data Analytics Techniques and Artificial Intelligence to debunk fake news or disinformation.
- xii. So far, Pakistan has been reluctant in joining Budapest treaty which is the only treaty on cybercrime and seventy-five countries are party to it. It is high time that there shall be a debate in the parliament as what are the benefits for Pakistan to join this treaty.

- xiii. Lastly, the Policy shall aim at developing a national law to counter fake news or disinformation with the consultation of all stakeholders including Journalists, Opposition law makers, members of civil societies, human rights organizations and digital rights activists.

### *Conclusion*

The study unfolds that undoubtedly dissemination of fake news or disinformation poses serious risk to social cohesion, integration and is a cause for tarnishing the image of national institutions. However, the legal regime and initiatives, be it undertaken by the provincial government of Punjab or the federal government, suffer from serious defects. The legislations are passed without developing a consensus and incorporating views of the stakeholders. Political expediency is preferred over developing policies having lasting impacts. The recent legislations, from their design, seem to be crafted to target political opponents and silence critical voices. The government's dominant and exclusive say in appointment and removal of the heads of the forums, responsible to curb fake news or disinformation, raises eyebrows on their autonomy and neutrality. Instead of opting for soft strategies such as fact-checking initiatives, digital literacy campaigns and using modern tools to counter fake news or disinformation, coercive measures have been adopted. Similarly, the strategies such as slowing down internet, blocking access to social media platforms and installation of firewall have impacts on the overall economy of the country.

### *Recommendations*

1. The Federal Government shall constitute a Parliamentary Committee consisting of members from both houses of the Parliament, having equal representation of opposition and treasury benches to reconsider the Prevention of Electronic Crimes (Amendment) Act, 2025 after inviting suggestions from Media bodies or Journalist associations and members of the civil society. A consensus-based amendment shall be proposed in the existing law for discussion and approval of the Parliament. The Parliamentary Committee shall be constituted by the Speaker of the National Assembly of Pakistan. Media bodies and Associations of Journalists be engaged by Ministry of Information and Broadcasting. The Ministry of Law & Justice shall be responsible for drafting amended law and placing the same before the Parliament for consideration.
2. The powers to appoint the Chairpersons and members of the Social Media Protection & Regulatory Authority, the Social Media Complaint Council and National Cyber Crimes Investigation Agency be given to the Parliamentary Committee, having equal representation of opposition and treasury benches, consisting of four members, two each from the National Assembly and the Senate.
3. The Chairpersons and members of the forums shall have security of the tenure. Their tenure shall be non-extendable.
4. The Chairperson and members of the Social Media Protection Tribunal shall be appointed and removed in consultation with the Chief Justice of

- Pakistan. The first appellate forum against the decisions of the Social Media Protection Tribunal shall be the concerned High Courts.
5. The Punjab Defamation Act, 2020 shall be amended to incorporate application of Qanoon-e-Shahadat to the proceedings of the Tribunal.
  6. The exclusive power of Chairperson of the Social Media Protection and Regulatory Authority to order removal of online content, within 24 hours of the receipt of the application, be abolished. The decision to remove the online content shall be taken by the Authority, with consensus, after conducting a formal inquiry.
  7. The dissemination of Fake News or Disinformation shall be treated as a civil wrong attracting damages. Imprisonments or arrests of journalists or YouTubers or Vloggers create bad images for the government.
  8. The government shall negotiate with the Social Media Platforms that they introduce fact-checking initiatives for their users in Pakistan. Whatsapp and Facebook have launched such initiatives in India.
  9. The IFCN (International Fact Checking Network) offers training to the Journalists and officials dealing with fake news or disinformation. The Government shall approach IFCN to offer trainings to Pakistan based journalists as well. Moreover, the private fact checking initiatives such as Soch fact check, AFP Fact check etc. be encouraged by the Government.
  10. The Ministry of Information and Broadcasting shall apply data analysis techniques such NLP, Machine learning models, network analysis, fact checking with AI and Semantic Analysis tools to filter fake news or disinformation.
  11. In the definition clause of the Prevention of Electronic Crimes (Amendment) Act, 2025, the definition of expression "Aspersions" is too broad. It shall be rephrased as the intentional crafting and spread of fake or baseless information to hurt someone's reputation.

### *Log Frame Matrix*

Action	By	How
1. Proposing amendments in the Prevention of Electronic Crimes (Amendment) Act, 2025 in consultation with the opposition parties, Associations and Bodies of Journalists and Civil Society Members	<ul style="list-style-type: none"> <li>• Parliament i.e. the National Assembly &amp; Senate of Pakistan</li> <li>• Ministry of Law &amp; Justice</li> <li>• Ministry of Information &amp; Broadcasting</li> <li>• President for assent as he has powers, for one time, to refer back the bill to the Parliament for reconsideration</li> </ul>	<p>The Speaker National Assembly shall constitute a Committee having members from treasury and opposition benches, from both houses, as well representatives of Journalists' Associations and Civil Society.</p> <p>This Committee shall deliberate and propose consensus-based amendments in the Prevention of Electronic Crimes (Amendment) Act, 2025.</p> <p>Once consensus is reached, the Ministry</p>

		<p>of Law &amp; Justice shall prepare the draft amendments and place before the Parliament for consideration.</p> <p>To engage with the Journalists and Media persons will be the responsibility of the Ministry of Information and Broadcasting.</p>
<p>2. The fake news or disinformation shall be treated as a Civil wrong for which penalty is damages. The clause regarding criminalizing of the fake news or disinformation shall be deleted.</p>	<ul style="list-style-type: none"> <li>• The Prime Minister's Office.</li> <li>• Ministry of Law and Justice to propose amendments in the form a new bill.</li> <li>• Parliament i.e. National Assembly &amp; Senate for approval of draft amendments.</li> <li>• President for giving assent to the Bill.</li> </ul>	<ul style="list-style-type: none"> <li>• The Prime Minister shall invite journalists and media persons on a luncheon and inform them that the Government has decided to amend the clause wherein up to three (03) years or two (02) million fine was prescribed for "aspersions" or "unlawful content". An amendment is being introduced to treat disinformation as a Civil wrong.</li> <li>• The Ministry of Law and Justice shall, thereafter, prepare a draft bill and place it before the both Houses of the Parliament for approval.</li> <li>• This will increase government's goodwill as well improve its image.</li> </ul>
<p>3. Appointment &amp; Removal of chairpersons and members of Social Media Protection &amp; Regulatory Authority, Social Media Complaint Council and National Cyber</p>	<ul style="list-style-type: none"> <li>• Parliament i.e. the National Assembly and Senate</li> <li>• Ministry of Law &amp; Justice</li> <li>• Ministry of Interior</li> </ul>	<ul style="list-style-type: none"> <li>• The Ministry of Law and Justice in consultation with Ministry of Interior shall propose amendments in the Prevention of Electronic Crimes (Amendment) Act, 2025.</li> </ul>

Crimes Investigation Agency be given to the Parliamentary Committee, having equal representation of opposition and treasury benches, of both houses of the Parliament to be constituted by the Speaker National Assembly		<ul style="list-style-type: none"> <li>• The Bill shall be placed before both houses for approval.</li> <li>• After approval, the Speaker shall constitute the Committee.</li> <li>• The panel for appointment of Chairpersons and members of the forums shall be placed by Ministry of Interior for consideration of the Committee.</li> </ul>
4. The chairperson of the Social Media Protection Tribunal be appointed and removed in consultation with the Chief Justice of Pakistan.	<ul style="list-style-type: none"> <li>• Parliament i.e. the National Assembly and Senate</li> <li>• The Supreme Court of Pakistan</li> <li>• Ministry of Law &amp; Justice</li> <li>• Ministry of Interior</li> </ul>	<ul style="list-style-type: none"> <li>• The draft amendments in the Prevention of Electronic Crimes (Amendment) Act, 2025 be proposed to change the procedure for the appointment of Chairperson and members of the Tribunal.</li> <li>• Thereafter, the draft Bill be placed for consideration of the Parliament.</li> <li>• After approval of the draft amendments, Ministry of Law &amp; Justice shall share names for appointment of chairperson and members of the tribunal with the Chief Justice of Pakistan, through the Registrar Supreme Court of Pakistan, for consultation. On receiving consent of the Chief Justice of Pakistan, the appointment be notified.</li> </ul>
5. High Courts shall be first appellate forums against the	<ul style="list-style-type: none"> <li>• Parliament i.e. the National Assembly and Senate</li> </ul>	<ul style="list-style-type: none"> <li>• Ministry of Law &amp; Justice shall propose</li> </ul>



decisions of Social Media Protection Tribunal	<ul style="list-style-type: none"> <li>• President</li> <li>• Ministry of Law &amp; Justice</li> </ul>	<p>amendments in the Prevention of Electronic Crimes (Amendment) Act, 2025, to add the concerned High Courts as first Appellate Authority against the Orders of the Tribunal.</p> <ul style="list-style-type: none"> <li>• The Bill shall be placed before both houses of the Parliament for consideration</li> </ul>
6. Giving powers of the Civil Court to the Tribunal	<ul style="list-style-type: none"> <li>• Parliament i.e. the National Assembly and Senate</li> <li>• President</li> <li>• Ministry of Law &amp; Justice</li> </ul>	<ul style="list-style-type: none"> <li>• This will also require an amendment in the Prevention of Electronic Crimes (Amendment) Act, 2025.</li> <li>• Ministry of Law &amp; Justice shall introduce a bill for amendment in the existing Law and after approval of both houses, same shall be notified.</li> </ul>
7. Implementing Qanoon-e-Shahdat, 1984 on the proceedings of the Tribunal constituted under the Punjab Defamation Act, 2024. The clause regarding preliminary damages and leave to defend be deleted.	<ul style="list-style-type: none"> <li>• Law &amp; Parliamentary Affairs Department, Government of Punjab</li> <li>• Provincial Assembly</li> <li>• Governor</li> </ul>	<ul style="list-style-type: none"> <li>• The Law &amp; Parliamentary Affairs Department, Government of Punjab shall introduce amendments in the Punjab Defamation Act, 2024.</li> <li>• After approval of the Provincial Assembly and assent of the Governor, same shall be notified.</li> </ul>
8. Use of Data Analytics to Identify Fake News <b>Use of Natural Language Processor:</b> NLP is the usage of algorithms to comprehend human language. For	<ul style="list-style-type: none"> <li>• Ministry of Information &amp; Broadcasting</li> <li>• Ministry of Information Technology and Telecommunication</li> <li>• NITB &amp; PITB</li> </ul>	<ul style="list-style-type: none"> <li>• Ministry of Information and Broadcasting shall in collaboration with Ministry of IT &amp; Telecommunication shall use and develop data analytical</li> </ul>

<p>identifying fake news, NLP analyses the text to detect patterns, such as sensational language, inconsistencies, or claims that don't match known facts. A common NLP application is sentiment analysis, which assesses the emotional tone of a news article. Tools like Vader or Text Blob can be used to automatically analyse the sentiment of articles and flag overly sensational content as having potential of being fake.</p> <p><b>Machine Learning Model:</b> Machine learning models can be trained on large datasets containing examples of both real and fake news to learn the distinguishing features. Using Random Forest or Support Vector Machines (SVM).</p> <p><b>Network Analysis:</b> It involves understanding how information disseminates across different networks and determining the patterns typical of fake news. Thereafter, using tools like Gephi or NetworkX to visualize, analyse and map these networks</p> <p><b>Use of Artificial Intelligence:</b> using AI to compare the claims made in a news item against verified data sources. AI will quickly cross-reference and evaluate the authenticity of the content.</p>		<p>techniques and Artificial Intelligence to counter fake news.</p> <ul style="list-style-type: none"><li>• The High-Tech companies be engaged in this regard to help the Government.</li></ul>
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<p><b>Semantic Analysis Tools e.g. IBM Watson:</b> This Analysis is used to determine subtle cues that indicate disinformation, such as contradictory claims or facts within the same article. Say a news story claims that certain even has taken place ten years ago, semantic analyse can confirm or refute this based on the historical data.</p>		
<p>9. Digital literacy &amp; Public awareness Campaigns and Fact Checking initiatives are effective to curb fake news or disinformation. Only two of Pakistan's local facts check platforms are part of International Factchecking network. There is a need to increase the number of facts checking platforms. The news channels shall also start their fact check initiatives so as to flag fake news or disinformation.</p>	<ul style="list-style-type: none"> <li>• Ministry of Information &amp; Broadcasting</li> <li>• Ministry of Information Technology &amp; Telecommunication</li> <li>• PEMRA</li> </ul>	<ul style="list-style-type: none"> <li>• Seminars and Workshops to increase digital literacy. Engaging students of universities.</li> <li>• PEMRA to convince all news channels to start fact-checking initiatives.</li> <li>• Ministry of Information &amp; Broadcasting to coordinate with IFCN for training Pakistan's Journalists in Factchecking.</li> </ul>
<p>10. Strengthening laws of Libel, Defamation and Slander so that the cases are disposed of quickly</p>	<ul style="list-style-type: none"> <li>• Parliament i.e. the Senate &amp; National Assembly</li> <li>• Ministry of Law &amp; Justice</li> <li>• Supreme Court of Pakistan</li> </ul>	<ul style="list-style-type: none"> <li>• Amendments be introduced in the Defamation Ordinance to make the disposal of defamation case time bound i.e. within three (03) months.</li> <li>• Moreover, the Chief Justice of Pakistan be requested to make disposal of Defamation suits part of the</li> </ul>

		National Judicial Policy. In National Judicial Policy, the vision is provided to the subordinate Judiciary.
11. Engaging with Social Media Platforms to open their offices in Pakistan and depute their representatives	<ul style="list-style-type: none"> <li>• Ministry of Foreign Affairs</li> <li>• Ministry of Information Technology and Telecommunication</li> </ul>	<ul style="list-style-type: none"> <li>• The Social Media Platforms be engaged to open their offices in Pakistan. Though the Prevention of Electronic Crimes (Amendment) Act, 2025 has a provision but this a gigantic task for which parleys or negotiations need to be made with CEOs of the Social Media Platforms. It will be a tedious process to convince them given the security and legal paradigm of Pakistan but effort can be made.</li> </ul>

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# Critical Evaluation of current Policies and Practices in TVET and its impact on Employment and Industry in Pakistan

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## Abstract:

This study critically evaluates Pakistan's Technical and Vocational Education and Training (TVET) policies, emphasizing their effectiveness and impact on employment and industry. Despite policy reforms, challenges persist, including outdated curricula, weak industry linkages, and limited quality training access. Misalignment between training programs and labor market demands leads to a skills mismatch and youth unemployment. Policies like the National Skills Strategy and public-private initiatives attempt to address these issues but suffer from fragmented implementation and limited scalability. Integration of digital skills, green technologies, and entrepreneurship remains insufficient to meet evolving market demands. Through SWOT, EETH, PESTEL, and GAP analyses, the study identifies gaps and recommends fostering industry-academia linkages, enhancing governance, improving funding mechanisms, and leveraging technology to strengthen TVET. Holistic reforms are urgently needed to align TVET with local and global industrial demands, ensuring sustainable economic and industrial growth in Pakistan.

## Key words:

TVET, Skills mismatch, Industry linkages, Policy reforms, Technology integration.

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## *Introduction*

Pakistan ranks as the fifth most populous country in the world with a population of around 245 million. Out of this a huge portion i.e 64 % population is under the age of 30 (Economic Survey of Pakistan, 2023). This bulge can either act as a time bomb or a demographic dividend, contingent on the engagement of youth in productive activities. The reason being the high unemployment rate of 6.3%. The worsening economic conditions such as low economic growth, fiscal imbalances, lack of opportunities have contributed to many critical issues affecting all segments of society particularly youth and women. The growing desperation has resulted in the youth resorting to illegal activities including drug addiction and trafficking, human smuggling, involving in terrorist activities etc. (Habib, 2024) Women lot also bear this brunt in terms of exploitation, domestic violence, divorces, unsafe working environment. (ADB, 2016). Furthermore, In Pakistan a significant portion of population i.e around 29.75 % of individuals are single. (Daily Pakistan) More than 10 million women are unmarried which has negative repercussions on the social and domestic fabrics. (Bureau of Statistics). The economic pressures exacerbated by the systemic gender inequality and social neglect has turned the youth into a potential threat. This situation requires a positive youth engagement to turn this resource into economically productive and socially responsible citizens. (Alisha, 2023)

The education sector is divided into two streams namely general education and TVET sector. The general education framework consists of primary, secondary and higher secondary level. After which either education can be pursued in general education or TVET. The later differs from general education in its methodology as it focuses on imparting practical skills rather than theoretical knowledge. There exists a disparity between both the streams in terms of enrolment as well as productivity. Presently only 4% of youth population is enrolled in skill education sector as compared to 69% in general education. (NSIS, 2022). Notwithstanding with the fact that low enrolment in TVET is attributed to many factors such as limited number of institutes, outdated curricula, weak enforcements, public mistrust, the employability absorption of TVET is far better than general education and TVET graduates. The TVET employment data indicates that in TVET sector, 70% of graduate get employment generating 80% of remittances (GIZ/BEO statistics 2023). keeping in view the great significance of TVET sector on economic indicators it can be deduced that investment in this sector is need of the hour. The relevance of TVET further get strength given the fact that Pakistan produces 0.45 million skilled workforces annually against the demand of 1 million (NSIS,2022). The availability of high skilled Labor has transformed Hong Kong, Singapore, Taiwan and Korea into Asian Tigers.

An effective TVET sector has the potential to ameliorate the dismal economic and social conditions of the country. (Ministry of Manpower, Singapore)

### *Background*

Pakistan's TVET system is regulated through more than 13 acts/laws at federal and provincial level (NSIS). The present TVET regime gained momentum from Musharraf period with the establishment of the National Vocational and Technical Education Commission (NAVTEC). General Pervez Musharraf's government, in 2005, responded to Pakistan's urgent need for a skilled workforce to address growing unemployment, support industrial growth, and prepare the country for globalization. Recognizing the gap between market demands and workforce skills, NAVTEC was tasked with streamlining and modernizing the fragmented TVET sector. The government aimed to empower the youth, alleviate poverty, and boost economic productivity through skill development. At the time, the Musharraf administration allocated a significant portion of its development budget to education and skill enhancement, with an emphasis on aligning technical and vocational training with industry requirements. In its initial years, NAVTEC received PKR 1.6 billion (approximately \$27 million) under the Public Sector Development Programme (PSDP) to expand TVET infrastructure, update curricula, and initiate training programs. This budget reflected the government's commitment to bridging the skills gap, though resource constraints and limited institutional capacity hindered full implementation. Despite challenges, NAVTEC marked a shift in Pakistan's policy focus, emphasizing human capital development as a cornerstone for economic reform and social empowerment during Musharraf's era.

The NAVTTC Act 2011 of Pakistan established the National Vocational and Technical Training Commission (NAVTTC) as an autonomous body under the Federal Government. The purpose was to promote skill development and technical education to enhance employability and standardize TVET qualifications in line with national and international standards. It was meant to formulate policies, give a strategic guidance, establish National Vocational Qualification Framework and promote Public Private Partnership etc. However, the bleak picture in terms of statistics of the demand-supply gap, public perception and economic indicators is an evidence that there is a need for major course corrections.

The TEVTA Strategy 2009-2013 was developed in Pakistan to align technical and vocational education with national and international demands. Its main objectives were aimed at improving the quality, access, and relevance of technical and vocational training to support economic development. This provided an impetus to focus on competency-based learning and a paradigm shift from conventional methods of training.

This strategy aimed to transform Pakistan's TVET sector into a responsive, demand-driven system capable of equipping individuals with skills for sustainable livelihoods and contributing to the national economy. However, the strategy despite a comprehensive theoretical framework faced implementation challenges such as limited industry linkages, outdated curricula etc hindering alignment with global Labor market needs. The sector also suffers from inadequate infrastructure, insufficient funding, and a shortage of qualified trainers, resulting in low-quality training outcomes. Unlike global models that prioritize public-private partnerships, innovation, and lifelong learning opportunities, Pakistan's TVET system still struggles with weak institutional coordination and limited use of modern technologies.

In 2018 the National TVET Policy of Pakistan was developed as a comprehensive framework to address the challenges in the Technical and Vocational Education and Training (TVET) sector and align it with national development goals. The policy aimed to modernize the TVET system, enhance employability, and meet the demands of a dynamic labour market. The policy developed presents a holistic picture by objectivising national commitment by key stakeholders such as government, employers, community organizations for skill enhancement, improved training paraphernalia, adherence to international training standards, strengthened public private partnerships, international recognitions and continuous improvement. However, likewise the strategy the critical gaps remains a persistent feature and there is a huge gulf between the objectives set in the policy and the situation at hand.

In pursuit of the objectives "The National "Skills for All" Strategy 2018 was introduced to modernize and enhance the technical and vocational education and training (TVET) sector in Pakistan. The strategy aimed to create a skilled workforce aligned with market demands, improve employability, and promote entrepreneurship. As envisaged in all other such documents, the promise of this strategy also remains far from real situation on ground. Be that the resource allocation or communication strategy, to name a few, to translate the objectives set into reality has been a persistent area of concern.

Besides the above legal and institutional frameworks there exist National Skill forum, National Skill Information System, Apprenticeship ACT 2018 at Federal Government and Apprenticeship Act 2022 at KP. Moreover, the following initiatives have been taken at Federal and Provincial level:

### *Federal Level Initiatives*

- **Prime Minister's Youth Skills Development Program**  
Prime Minister's Youth Skills Development Program Launched by NAVTTC (National Vocational and Technical Training Commission), this program offers free skills training to unemployed youth, focusing on both traditional and emerging trades. **Outlay:** Rs. 19 billion
- **Hunarmand Pakistan (Skills for All) Initiative**  
Hunarmand Pakistan (Skills for All) Initiative A key component of the Kamyab Jawan Program, this initiative aims to develop skills in high-demand areas, including courses on emerging technologies, entrepreneurship, and certifications aligned with market needs. **Outlay:** Rs. 9.8 billion
- **Recognition of Prior Learning (RPL) Program**  
Recognition of Prior Learning (RPL) Program This NAVTTC program provides formal certification for informal skills acquired outside formal education, enhancing employability for those already engaged in skilled labor sectors without official credentials. **Outlay:** Rs. 2.5 billion
- **TVET Sector Support Program (TSSP) (EU-GIZ)**  
A collaborative initiative between NAVTTC and international partners (including the EU, Norway, and Germany) aimed at enhancing the quality of TVET and developing competency-based training standards across Pakistan.  
Outlay: \$62 million (Rs. 15.5 billion)
- **Matric Tech' Pathways for Integrating Technical and Vocational Education and Training (TVET) and formal education**  
Metric Tech program initiated by NAVTTC at the federal level in (08) trades/discipline (16 subjects) at 15 school of ICT, AJK and Gilgit Baltistan(GB), marks a transformative step for Pakistan's education system. By integrating technical and vocational streams with general education, this initiative aims to bridge the gap between education and employability while fostering a skilled workforce aligned with market demands.  
Outlay: (Rs. 310 million)
- **DigiSkills.pk**  
DigiSkills.pk enhances digital literacy across Pakistan by offering free online training, focusing on freelancing and entrepreneurship to reduce unemployment and boost foreign exchange. With over PKR 2 billion in government investment, courses span freelancing, technical, and soft skills, reaching over 2 million participants, including those from underprivileged areas, to bridge the digital divide.

- **Youth Empowerment Program (YEP)**  
Funded by the United Nations Development Programme (UNDP), this program focuses on skill-building for youth in marginalized areas, enhancing their employability through technical training. **Outlay:** \$10.2 million (Rs. 2.5 billion)
- **Specialized Technical Training under CPEC (China-Pakistan Economic Corridor)**  
This initiative encompasses joint training programs in specialized skills related to infrastructure and energy, preparing Pakistani youth for employment opportunities in CPEC projects. **Outlay:** Rs. 1 billion
- **Pak-China TVET Exchange Program.**  
This partnership with China facilitates skill exchanges and technology transfers, particularly in advanced fields such as ICT, engineering, and renewable energy. **Outlay:** Rs. 0.5 billion

### *Provincial Level Initiatives*

#### *Khyber Pakhtunkhwa (KP)*

- **KP Youth Employment Program**  
Launched by the KP Government, this program offers vocational training in skills aligned with regional employment opportunities, focusing on digital, construction, and industrial sectors. **Outlay:** Rs. 11 billion
- **KP TEVTA and Skills for Youth**  
This initiative provides competency-based training, targeting both traditional trades and emerging sectors, including specialized programs for women and marginalized communities. **Outlay:** Rs. 9 billion
- **Kamyab Jawan Program - KP Chapter**  
Equips youth with entrepreneurial training, soft skills, and vocational training tailored to high-demand sectors in the KP region. **Outlay:** Not specified
- **Economic Revitalization in Khyber Pakhtunkhwa and FATA (ERKF)**  
Provides vocational training and support to small and medium enterprises (SMEs) to create jobs and support youth employment, especially in areas affected by conflict. **Outlay:** Rs. 5 billion
- **COVID-19 Responsive Vocational Training Initiative**  
In response to the pandemic, this initiative trains youth in health-related skills, PPE production, and online digital skills, supporting economic recovery and job creation. **Outlay:** Not specified

Though the above initiatives under the federal and KP government have been undertaken by investing billions of rupees, but its impact is invisible, and the economic indicators still presents a gloomy picture.

The construction industry in Pakistan, which is experiencing a boom, with major projects like CPEC creating high demand for skilled labor, requiring an estimated 1.5 million workers in the next five years. Although Pakistan has numerous technical and vocational institutes, many TVET graduates struggle to find relevant employment due to a lack of practical experience. The Apprenticeship Act of 2018 mandates companies to provide training to apprentices, with benefits such as reduced recruitment costs and increased productivity. The federal government's Public Sector Development Programme includes 923 construction-related projects, which could generate approximately 18,000 training slots for TVET graduates. Expanding work-based training opportunities through effective implementation of the Apprenticeship Act would enhance employment prospects for TVET graduates and contribute to national development.

### *Statement of the Problem*

Unemployment remains a critical socio-economic challenge in Pakistan, with approximately 6 million youth unable to secure jobs due to a lack of skills or a mismatch between their acquired qualifications and the demands of both national and international labor markets. The Technical and Vocational Education and Training (TVET) sector has undertaken efforts to address the skills gap by providing technical and vocational training and upskilling programs. However, there are numerous reports indicating that these efforts are not adequate to address the problem. Therefore, this study aims to analyze the root causes of youth unemployment in Pakistan, particularly focusing on inefficiencies in the skills development ecosystem, identifying the gaps and evaluating the effectiveness of ongoing TVET initiatives, to propose actionable and sustainable policy solutions to enhance the employability of the youth.

### *Scope*

This study analyzes Pakistan's Technical and Vocational Education and Training (TVET) sector, focusing on the legal and institutional framework at the federal level and in Khyber Pakhtunkhwa (KPK) over the past 15 years. It explores the root causes of youth unemployment, emphasizing inefficiencies in the skill development ecosystem and identifying gaps specific to the federal and provincial contexts. By evaluating the effectiveness of ongoing TVET initiatives and programs implemented during this period, the study highlights critical areas for improvement. Furthermore, it proposes actionable and sustainable policy solutions to enhance TVET service delivery, align it with labor market demands, and make it a more effective driver of economic development in both federal and KPK settings. This targeted approach aims to address localized challenges while aligning with national goals to ensure an efficient and equitable TVET system.

## *Research Methodology*

- This study utilizes Primary and secondary data (qualitative & quantitative)
  - Department visit and interview
  - Performance Evaluation Reports
  - Research articles
- Situational and Institutional Analysis
- SWOT-EETH Analysis
- PESTEL Analysis
- Stakeholder Analysis
- GAP Analysis.
- Comparative Analysis

## *Analysis*

### *SWOT Analysis of NAVTTC*

#### **Strengths**

The National Vocational and Technical Training Commission (NAVTTC) serves as a cornerstone of Pakistan's Technical and Vocational Education and Training (TVET) sector, with several notable strengths that make it a pivotal institution in advancing workforce development across the country.

#### **1. National Coordination Role**

NAVTTC acts as the central authority responsible for ensuring uniformity and standardization in TVET policies, curricula, and qualifications across Pakistan. Its mandate includes developing frameworks and policies that align the TVET sector with national economic objectives. By facilitating collaboration between federal and provincial stakeholders, NAVTTC bridges the gap between various levels of government, ensuring cohesive and effective implementation of TVET initiatives. This coordination role is crucial for maintaining consistency and ensuring the adoption of best practices across provinces, particularly in a diverse and decentralized administrative environment.

#### **2. Policy Expertise**

NAVTTC has demonstrated significant expertise in policy development, exemplified by its leadership in formulating the **National Vocational Qualifications Framework (NVQF)**. This framework introduces a unified certification system that standardizes vocational qualifications, providing a structured pathway for learners. The NVQF not only ensures consistency across training programs but also enhances the credibility and recognition of Pakistan's TVET certifications both locally and internationally. Through this initiative, NAVTTC addresses the fragmentation in the sector and creates a robust foundation for skill recognition across the country.



### **3. International Partnerships**

NAVTTTC has cultivated strong relationships with global donors and development organizations such as the European Union (EU), GIZ, British Council, and UNESCO. These partnerships provide essential technical expertise and financial resources to support the modernization of Pakistan's TVET sector. By working closely with international stakeholders, NAVTTTC gains access to global best practices, innovative technologies, and training methodologies. These collaborations also facilitate capacity building within the institution and ensure that TVET reforms align with international labor market standards, enhancing the competitiveness of Pakistani labor abroad.

### **4. Alignment with National Vision**

NAVTTTC plays a critical role in supporting Pakistan's long-term economic goals, particularly those outlined in Vision 2025. The commission focuses on human capital development by emphasizing skill-based employability, bridging the gap between education and employment local as well as abroad. By aligning its objectives with national strategies, NAVTTTC contributes to fostering economic growth, reducing unemployment, and preparing the workforce for emerging industries such as information technology, renewable energy, and advanced manufacturing.

### **5. Capacity Building Initiatives**

One of NAVTTTC's key strengths is its focus on improving the quality of vocational education through capacity-building initiatives. The commission invests in the professional development of TVET trainers, assessors, and administrators and principals, ensuring they have the necessary skills to deliver high-quality training and manage programs effectively. By organizing skills upgrading workshops, training sessions, and certification programs for trainers/assessors/educators, NAVTTTC enhances the overall quality and credibility of the TVET system. This focus on capacity building also addresses the critical shortage of skilled instructors and improves the learning experience for trainees.

### **6. Global Recognition Efforts**

NAVTTTC has taken significant steps to align its certifications and training programs with international standards. By benchmarking its qualifications against global frameworks, NAVTTTC ensures that Pakistani TVET graduates are equipped with skills that meet international labor market demands. This alignment not only enhances the employability of Pakistani workers abroad but also strengthens Pakistan's reputation as a reliable source of skilled labor. The commission's efforts in this area contribute to increasing labor export opportunities, particularly in high-demand markets like the Gulf countries, while improving remittance inflows.

## **WEAKNESSES**

Despite its critical role in the TVET ecosystem, the NAVTTC faces several weaknesses that hinder its effectiveness and impact.

### **1. Implementation Challenges**

One of the significant hurdles for NAVTTC is its limited enforcement authority, especially in the post-18th Amendment governance framework, which decentralized education and implementation function of vocational training to provincial governments. This decentralization has led to inconsistencies in the implementation of national policies and frameworks. Provincial bodies often operate independently, creating gaps in coordination and standardization across regions. NAVTTC's inability to mandate compliance from provincial entities weakens its overall influence and diminishes the uniformity of TVET reforms.

### **2. Data Deficiencies**

NAVTTC suffers from the lack of a comprehensive national database that tracks TVET graduates, labor market trends, and training outcomes. This deficiency severely hampers evidence-based decision-making and policy planning. Without accurate and updated data, it is challenging to assess the effectiveness of training programs, identify skills gaps in the labor market, or forecast future workforce demands. This gap also limits the ability to monitor employment rates of TVET graduates, making it harder to measure the long-term impact of TVET initiatives.

### **3. Funding Reliance**

NAVTTC is heavily reliant on donor funding to sustain its programs and reforms. While international support from organizations like the EU, GIZ, and UNESCO has been instrumental, this overdependence on external funding raises concerns about sustainability. The lack of a diversified financing strategy or innovative mechanisms to generate domestic revenue leaves NAVTTC vulnerable to changes in donor priorities or funding availability, potentially disrupting long-term projects and reforms.

### **4. Bureaucratic Delays**

Administrative inefficiencies and bureaucratic red tape significantly slow down NAVTTC's policy approval and implementation processes. These delays often result in missed opportunities for timely interventions and reduce the institution's responsiveness to emerging labor market needs. Such inefficiencies not only affect program execution but also undermine stakeholder confidence in NAVTTC's ability to deliver results.

### **5. Limited Private Sector Engagement**

Despite its mandate to bridge the gap between the labor market and vocational training, NAVTTC has struggled to effectively involve the private sector in its activities. Industries and businesses remain underutilized in policy formulation, curriculum development, and program delivery.

This lack of collaboration results in training programs that are often misaligned with market demands, perpetuating the mismatch between the skills of TVET graduates and industry needs. The absence of strong public-private partnerships further limits opportunities for internships, apprenticeships, and job placements for trainees.

### **Opportunities**

The NAVTTC has several opportunities to enhance its role in transforming Pakistan's TVET sector into a driver of economic growth and development.

#### **1. Youth Demographic Dividend**

Pakistan's large youth population presents a unique opportunity to create a highly skilled workforce capable of meeting both local and international labor market demands. With a significant portion around 65% of the population under the age of 30, NAVTTC has the potential to harness this demographic dividend by designing and implementing programs that equip young people with the skills needed for emerging industries. Targeting this group will not only address unemployment but also position Pakistan as a global supplier of skilled labor.

#### **2. Economic Growth Projects**

Initiatives like the China-Pakistan Economic Corridor (CPEC) and the rise of industrialization have significantly reshaped Pakistan's economic landscape, creating a growing demand for specialized skills in key sectors such as construction, logistics, renewable energy, and manufacturing. These developments present a strategic opportunity for NAVTTC to realign its training programs to meet the evolving needs of these industries and the international labor market. By integrating globally recognized standards and certifications into its curricula, NAVTTC can ensure that Pakistani workers are competitive in both domestic and international markets.

For example:

- **Construction:** Focused training in advanced construction techniques, project management, health and safety standards, and compliance with international construction codes to prepare workers for large-scale projects locally and abroad.
- **Logistics:** Courses in global supply chain management, warehousing, and transportation logistics to meet the needs of industries requiring skilled logistics personnel worldwide.
- **Renewable Energy:** Programs that emphasize solar panel installation, wind turbine maintenance, and energy efficiency solutions, catering to the increasing demand for green energy professionals globally.
- **Manufacturing:** Specialized training in automation, precision engineering, and industrial equipment operations aligned with international standards for skilled labor.

To meet the demand for skilled workers in the global market, NAVTTC can establish **International Labor Skills Programs**, focusing on:

1. **Global Certifications:** Collaborating with internationally recognized accreditation bodies to ensure training programs meet the skills requirements of labor-receiving countries like the Gulf nations, Europe, and Southeast Asia.
2. **Language and Cultural Training:** Incorporating language skills (e.g., English, Arabic, Japanese, Korean, German) and cross-cultural communication training to better prepare workers for overseas work environments.
3. **Targeted Apprenticeships:** Developing partnerships with multinational corporations and labor-receiving countries to offer apprenticeships and internships that lead to direct placement opportunities abroad.
4. **Occupation-Specific Training:** Delivering training in high-demand global trades such as electricians, plumbers, welders, heavy machinery operators, and healthcare support staff.
5. **Workforce Mobility Agreements:** Negotiating bilateral agreements with labor-receiving countries to secure quotas and preferential hiring for Pakistani workers.

By aligning its training programs with economic growth projects like CPEC and global labor market requirements, NAVTTC can not only enhance the employability of TVET graduates but also strengthen Pakistan's position as a leading provider of skilled labor internationally. This approach will attract increased investment in the TVET sector, boost remittances, and ensure sustainable economic development for the country.

### 3. Digital Transformation

The rapid adoption of e-learning platforms, digital tools, and simulator-based training offers NAVTTC a transformative opportunity to expand access to skills development, particularly in underserved and remote areas. By leveraging these advancements, NAVTTC can introduce innovative learning methodologies, including virtual classrooms, online certification programs, and blended learning approaches, alongside state-of-the-art simulators. These approaches can overcome geographical barriers and provide learners with practical, hands-on experience in a controlled and cost-effective environment.

Simulator-based training is particularly valuable in high-demand technical fields such as welding, heavy machinery operation, electrical work, and the automobile sector. Using simulators, trainees can practice real-world scenarios with precision and safety, reducing material waste and minimizing risks associated with on-the-job training. For instance:

- **Welding Simulators:** Allow trainees to perfect welding techniques without consuming actual materials, enhancing skill accuracy and efficiency. (soldamatic)

- **Heavy Machinery Simulators:** Provide realistic training experiences for operators, including excavators, cranes, and forklifts, preparing them for challenging work environments while ensuring safety. (Simlog)
- **Electrical Field Simulators:** Enable learners to understand circuit design, fault detection, and repair in a risk-free setting.
- **Automobile Sector Simulators:** Train individuals in vehicle diagnostics, repair, and maintenance using interactive tools that replicate real-life scenarios.

These innovations not only address traditional training challenges but also promote inclusivity by enabling women and disadvantaged groups to access TVET programs. Simulator-based training, combined with digital learning, equips participants with the practical and technical expertise required to thrive in modern industries, ensuring they are job-ready and competitive in both local and international markets. By prioritizing digital transformation and simulator technology, NAVTTC can enhance the effectiveness, reach, and inclusivity of TVET programs, building a skilled workforce aligned with the demands of a technology-driven economy.

#### **4. International Collaboration**

NAVTTC has the opportunity to strengthen its ties with global TVET bodies and institutions to gain technical assistance, share knowledge, and adopt international best practices. Collaborations with organizations such as UNESCO, ILO, and regional TVET bodies like Colombo Plan Staff College (CPSC) can enhance the quality and relevance of Pakistan's vocational training programs. This opportunity also extends to adopting internationally recognized certification standards, which would improve the global employability of Pakistani graduates.

#### **5. Skills Recognition**

A significant portion of Pakistan's workforce acquires skills informally through systems like the Ustad-Shagird (Master-Apprentice) model. NAVTTC can formalize these skills through Recognition of Prior Learning (RPL) frameworks, providing certification and validation for informal learning. This initiative would improve employment prospects for workers, enhance productivity, and integrate these individuals into the formal economy, addressing the gaps in skilled labor supply.

#### **6. Public Awareness Campaigns**

Promoting TVET as a viable and respectable career pathway can help change public perceptions and reduce the stigma associated with technical education. By launching awareness campaigns that highlight success stories and the economic potential of vocational training, NAVTTC can attract more youth to its programs. This would also encourage parents and communities to view technical education as a valuable alternative to traditional academic routes, ultimately increasing enrollment and diversifying the talent pool.

## THREATS

The NAVTTC faces several external challenges that could impede its efforts to modernize and enhance Pakistan's TVET sector. These threats must be carefully addressed to ensure the effectiveness and sustainability of its initiatives.

### 1. Provincial Resistance

Following the 18th Amendment, which decentralized various sectors, including education and vocational training, coordination challenges between federal and provincial entities have become evident. This decentralization has led to overlaps, gaps, and occasional disputes over autonomy and roles, complicating the seamless implementation of national TVET policies and programs.

Provincial resistance to federal oversight often undermines NAVTTC's ability to ensure uniformity in standards, curricula, and certification frameworks. This lack of alignment results in fragmented governance, inconsistencies in training quality, and reduced overall impact of reforms. Divergent provincial priorities further exacerbate these challenges, making it difficult to establish a cohesive and effective TVET system across the country.

### 2. Economic Instability

Pakistan's recurring economic challenges, including inflation, budget deficits, and financial crises, pose a significant threat to the TVET sector. Budget cuts during periods of economic instability could result in reduced funding for NAVTTC's initiatives, compromising the quality and reach of training programs. Limited financial resources may also hinder the implementation of new projects, capacity-building efforts, and the adoption of innovative technologies, further stalling the sector's growth.

### 3. Global Competition

In the international labor market, Pakistani workers face stiff competition from countries with well-established TVET systems such as the Philippines, India, and Vietnam. These nations often produce highly skilled workers with internationally recognized certifications, making them more attractive to employers abroad. If NAVTTC fails to align its programs with global standards, it risks losing labor market opportunities for Pakistani workers, thereby reducing remittances and limiting employment prospects for TVET graduates.

### 4. Cultural Perception

A long-standing societal bias against vocational education remains a significant threat to NAVTTC's mission. Vocational training is often perceived as inferior to traditional academic education, discouraging many young people and their families from pursuing TVET programs. This cultural stigma limits enrollment in vocational training institutes and hampers NAVTTC's ability to build a diverse and robust skilled workforce. Overcoming this perception requires sustained awareness campaigns and efforts to showcase the value of technical education.

## 5. Fragmented Systems

Weak coordination between NAVTTC and provincial TEVTAs exacerbates the challenges of managing a cohesive TVET system. The lack of synchronization can result in the duplication of efforts, wasted resources, and inconsistent quality standards across provinces. Fragmentation undermines the effectiveness of national policies and makes it harder to address regional skill needs or align programs with local industries. This disjointed approach also reduces the overall efficiency of the sector and limits its potential to achieve large-scale improvements.

### *EETH Analysis of NAVTTC*

**Enhancing the Strengths:** NAVTTC possesses several strengths that establish its role as a pivotal entity in Pakistan's TVET sector. To maximize the impact of these strengths, targeted strategies can further enhance their effectiveness and utility:

#### 1. National Coordination Role

- **Enhancement Approach:**

Strengthen collaboration mechanisms between federal and provincial governments by introducing regular convene the meeting of the TVET National Coordination Committee meeting, inter-provincial dialogues, joint working groups, and performance monitoring systems.

Implement a centralized digital platform for the coordination of TVET policies, curricula, qualification standards and TVET training programs to minimize redundancies and inconsistencies.

- **Impact:**

Improved cohesion and uniformity across the country's TVET framework, ensuring smoother policy implementation and increased efficiency in addressing regional needs.

#### 2. Policy Expertise

- **Enhancement Approach:**

Expand the development and implementation of the National Vocational Qualifications Framework (NVQF) to incorporate emerging industries such as artificial intelligence, renewable energy, and e-commerce.

Increase stakeholder participation, including relevant industry experts, academia, and provincial TEVTAs, during the policy formulation process to ensure broader acceptance and relevance and implementation policies accordingly.

- **Impact:**

Policies and standards that remain agile and aligned with evolving market and technological demands, improving the employability of graduates.

### 3. International Partnerships

- **Enhancement Approach:**

Deepen collaborations with international donors and organizations by initiating joint pilot projects, knowledge-sharing forums, and long-term funding agreements. Focus on leveraging international expertise to design training programs and certifications that meet global labor market demands.

- **Impact:**

Enhanced access to financial resources and best practices, allowing NAVTTC to develop innovative, globally recognized programs and certifications.

### 4. Alignment with National Vision

- **Enhancement Approach:**

Actively integrate TVET programs into key national projects such as CPEC, Vision 2025, and other industrialization initiatives by developing tailored skill training plans.

Create specialized task forces to identify future skill demands based on Pakistan's economic priorities.

- **Impact:**

Strengthened alignment with national development goals, leading to higher recognition of NAVTTC's role in economic transformation.

### 5. Capacity Building Initiatives

- **Enhancement Approach:**

Investing in the Training of Trainers (ToT) programs and upskilling national assessors is essential to enhancing the quality and effectiveness of Pakistan's TVET sector. Equipping trainers, assessors, and administrators with advanced pedagogical and technological skills will ensure they are prepared to meet the dynamic demands of local industries and international markets.

Collaborations with globally recognized training institutions to offer certification programs for TVET trainers and assessors can elevate their professional expertise. These partnerships would facilitate the adoption of cutting-edge teaching methodologies, innovative assessment practices, and international best practices, aligning Pakistan's TVET standards with global benchmarks.

Moreover, strengthening and standardizing the licensing system for assessors nationwide is crucial. Making licensing mandatory for all assessors will ensure consistency, accountability, and quality in the assessment process. This initiative will also build trust among employers, both domestically and internationally, in the skills and certifications awarded to TVET graduates.

- **Impact:**

Improved teaching quality and system management capabilities, leading to better learning outcomes and industry-ready graduates.



## 6. Global Recognition Efforts

- **Enhancement Approach:**

Fast-track the alignment of TVET certifications with international standards, such as those set by **WorldSkills International** and **ISO certifications**.

Establish dedicated task forces to negotiate mutual recognition agreements (MRAs) with labor-receiving countries, ensuring easier acceptance of Pakistani workers abroad.

- **Impact:**

By implementing these measures, the TVET sector can establish a sustainable ecosystem of highly competent trainers and assessors, improve training and assessment quality, and enhance the employability and credibility of Pakistan's workforce in both local and global markets.

### ***ELIMINATING WEAKNESSES***

NAVTTTC's weaknesses, if addressed strategically, can transform into opportunities for growth and improvement. Below are detailed approaches to overcome these challenges:

#### **1. Implementation Challenges**

- **Cause:** Limited enforcement authority due to decentralized governance after the 18th Amendment.

- **Elimination Approach:**

- Establish clear federal-provincial collaboration frameworks that outline roles, responsibilities, and decision-making authority.
- Advocate for amendments in TVET-related legislation to grant NAVTTTC stronger oversight powers for policy implementation.
- Form joint task forces with provincial TEVTAs to ensure cohesive and uniform implementation of national TVET policies.
- Developing comprehensive rules and regulations under existing laws is essential to ensure the effective enforcement of policies and their successful implementation. Clearly defined regulatory frameworks provide guidance, standardize procedures, and eliminate ambiguities, enabling consistent application across all levels. These rules should be aligned with national priorities and tailored to address local challenges, ensuring that policies translate into actionable and measurable outcomes.
- Additionally, the enforcement mechanisms must be robust, with clear accountability structures and regular monitoring to assess compliance and effectiveness.

- By establishing well-framed rules and regulations, policymakers can bridge the gap between legislative intent and practical implementation, fostering efficiency, transparency, and long-term sustainability in policy execution.
- **Outcome:**  
Improved policy enforcement and streamlined governance, reducing inconsistencies across provinces.

## 2. Data Deficiencies

- **Cause:** The lack of a comprehensive national database for TVET graduates, labor market trends, and training outcomes limits effective planning. The underutilization of the NAVQF registry system further restricts tracking graduates, matching skills with industry needs, and evaluating training impact. This data gap hinders informed decision-making and prevents alignment of TVET programs with market demands.
- **Elimination Approach:**
  - Develop a centralized National TVET Data Management System that integrates the NAVQF registry to track enrollment, certifications, employment outcomes, and labor market needs, ensuring a comprehensive view of the TVET sector.
  - Collaborate with provincial TEVTAs, industry associations, and labor market experts to facilitate comprehensive data collection, analysis, and ensure that the system remains aligned with regional and national skills requirements.
  - Leverage AI and analytics tools to forecast skill demands, assess program effectiveness, and identify areas for improvement, helping to optimize training efforts and better match graduates with market needs.
- **Outcome:**  
Data-driven decision-making that enhances planning, resource allocation, and alignment with market needs.

## 3. Funding Reliance

- **Cause:** Overdependence on donor funding, with limited exploration of sustainable financing mechanisms.
- **Elimination Approach:**
  - Develop alternative funding streams through partnerships with private sector stakeholders and industries benefiting from TVET graduates.
  - Introduce income-generating initiatives such as paid training programs, consulting services, or skill certifications for corporate clients.

- Advocate for increased government budget allocation to TVET as a long-term investment in economic growth.
- **Outcome:**  
Financial independence and sustainability, reducing vulnerability to donor withdrawal.

#### 4. Bureaucratic Delays

- **Cause:** Inefficiencies in administrative processes lead to delays in policy approvals and implementation. Additionally, the appointment of officials without technical expertise in TVET bodies further exacerbates these issues, as they may lack the necessary understanding to make informed decisions, streamline operations, or address sector-specific challenges effectively. This results in slow progress and missed opportunities for reform within the TVET system.
- **Elimination Approach:**
  - Simplify approval procedures by introducing streamlined workflows and leveraging technology for document processing and communication, ensuring faster decision-making and implementation.
  - Provide training for administrative staff in project management, efficiency improvement techniques, and sector-specific knowledge to improve overall operational effectiveness.
  - Set clear performance benchmarks for policy development and implementation timelines to ensure timely and impactful execution.
  - Address the issue of appointing officials without technical expertise in TVET bodies by establishing clear qualification requirements and ensuring that decision-makers possess the necessary knowledge and skills to oversee the sector effectively.
- **Outcome:**  
Streamlined policy approvals and enhanced project execution will lead to the faster realization of TVET objectives. This will result in more efficient implementation of reforms, ensuring that the sector adapts swiftly to industry needs and contributes more effectively to economic growth and workforce development.

#### 5. Limited Private Sector Engagement

- **Cause:** Insufficient involvement of industries and businesses in TVET policy formulation and program delivery.
- **Elimination Approach:**
  - Establish dedicated **Industry Liaison Committees** to ensure active private sector participation in curriculum design, internships, and apprenticeships.

- Provide tax incentives or subsidies to businesses that collaborate with NAVTTC on training programs.
- Host regular industry-focused forums to align TVET initiatives with emerging labor market needs.
- **Outcome:**  
Enhanced relevance and market alignment of TVET programs, improving employability and industry satisfaction.

### ***Taking Advantage of Opportunities***

NAVTTC's opportunities present a valuable chance to enhance the effectiveness of Pakistan's TVET sector and contribute to national economic growth. Strategic actions to leverage these opportunities are detailed below:

#### **1. Youth Demographic Dividend**

- **Opportunity:**  
Pakistan's large youth population provides an abundant labor pool that, if trained effectively, can fulfill both local and global labor demands.
- **Action Plan:**
  - Design targeted training programs in high-demand sectors such as IT, renewable energy, construction, and healthcare.
  - Partner with provincial TEVTAs to increase outreach in rural and underserved areas where youth participation in TVET programs is low.
  - Develop apprenticeship and internship programs to provide real-world experience and improve workforce readiness.
- **Impact:**  
A highly skilled workforce that contributes to economic growth, reduces unemployment, and strengthens Pakistan's competitive edge in global labor markets.

#### **2. Economic Growth Projects**

- **Opportunity:**  
Mega initiatives like CPEC and rapid industrialization create new demand for skilled workers in infrastructure, logistics, and manufacturing.
- **Action Plan:**
  - Collaborate with industries involved in CPEC to identify specific skills required and customize TVET curricula accordingly.
  - Establish specialized training centers in regions directly impacted by economic growth projects to meet local labor needs.
  - Develop certification programs aligned with international construction, transportation, and energy standards to improve employability.

- **Impact:**  
Alignment of training with industrial growth ensures that projects like CPEC benefit from a skilled local workforce, reducing dependency on foreign labor.

### 3. Digital Transformation

- **Opportunity:**  
E-learning platforms and digital tools can expand access to skills training, especially in remote and underserved regions.
- **Action Plan:**
  - Launch an **online TVET portal** offering courses in digital skills, coding, graphic design, and online freelancing.
  - Equip TVET institutions with modern IT infrastructure and train instructors in digital pedagogy.
  - Partner with technology companies to provide hardware, software, and certification programs for emerging tech skills.
  - Simulator-based training is particularly valuable in high-demand technical fields such as welding, heavy machinery operation, electrical work, and the automobile sector. Using simulators, trainees can practice real-world scenarios with precision and safety, reducing material waste and minimizing risks associated with on-the-job training.
- **Impact:**  
Widespread accessibility to high-quality training, fostering digital literacy and creating employment opportunities in the global digital economy.

### 4. International Collaboration

- **Opportunity:**  
Stronger ties with global TVET bodies provide technical assistance, funding, and access to best practices.
- **Action Plan:**
  - Strengthen partnerships with organizations like **ILO**, **EU**, **GIZ**, and **UNESCO** for technical guidance and resource sharing.
  - Engage in international knowledge-sharing forums to adopt innovative training techniques and standards.
  - Collaborate with labor-receiving countries to establish mutual recognition agreements (MRAs) for TVET certifications.
- **Impact:**  
Improved quality of training and certifications, enabling Pakistani workers to compete globally and increasing remittances.

## 5. Skills Recognition

- **Opportunity:**

Formalizing informal skills, such as those acquired through the Ustad-Shagird system, can enhance employability and workforce productivity.

- **Action Plan:**

- Implement a national Recognition of Prior Learning (RPL) framework to certify informal skills through competency-based assessments, enabling workers to gain formal recognition for their expertise.
- Launch awareness campaigns to highlight the benefits of skill certification for informal workers, encouraging them to pursue formal recognition and access better job opportunities.
- Facilitate the integration of certified informal workers into formal sectors, improving their income potential, job stability, and overall career prospects.
- Engage industries such as construction, the service sector, and other key industries to recognize and hire certified informal workers through the RPL system, ensuring that employers value their skills and contribute to the growth of a skilled workforce.

- **Impact:**

Bridging the gap between informal and formal economies, increasing workforce efficiency, and providing better job opportunities for skilled workers.

## 6. Public Awareness Campaigns

- **Opportunity:**

Promoting TVET as a viable career path can attract more youth and reduce societal stigma surrounding technical education.

- **Action Plan:**

- Conduct nationwide TV and social media campaigns highlighting success stories of TVET graduates and its economic benefits.
- Partner with schools to introduce TVET career counseling programs for students and parents.
- Celebrate national TVET achievements through skills competitions and publicized events to enhance its image.

- **Impact:**

Increased enrollment in TVET programs, a cultural shift toward recognizing vocational education, and better utilization of training resources.

## Hedging Against Threats

To mitigate the threats NAVTTC faces, proactive strategies and robust policy frameworks are essential. Below is a detailed plan to address these challenges and safeguard the progress of Pakistan's TVET sector:

### 1. Provincial Resistance

- **Threat:** Tensions between federal and provincial bodies over autonomy and roles can undermine policy implementation.
- **Hedging Strategy:**
  - Establish a **Federal-Provincial Coordination Committee** to regularly discuss and resolve conflicts, ensuring alignment on policy objectives.
  - Promote cooperative agreements that clearly define the responsibilities of NAVTTC and provincial TEVTAs to avoid overlaps and disputes.
  - Introduce incentives for provinces to adopt NAVTTC-recommended policies and standards, such as funding allocations linked to compliance.
- **Impact:**  
Enhanced collaboration between federal and provincial entities, minimizing resistance and fostering unified TVET development.

### 2. Economic Instability

- **Threat:** Budget cuts or economic slowdowns could limit funding for TVET initiatives.
- **Hedging Strategy:**
  - Diversify funding sources by engaging private sector stakeholders, introducing Public-Private Partnerships (PPPs), and developing self-sustaining programs.
  - Advocate for TVET as a priority investment in national development, ensuring stable government budget allocation even during economic crises.
  - Develop cost-effective training models, such as hybrid learning and community-based training centers, to reduce dependency on large-scale funding.
- **Impact:**  
Reduced reliance on fluctuating economic conditions, ensuring continuity of TVET programs.

### 3. Global Competition

- **Threat:** Other countries with established TVET systems may attract international labor market opportunities, reducing demand for Pakistani workers.

- **Hedging Strategy:**

- Align Pakistan's TVET certifications with international standards to enhance the credibility of qualifications and ensure that the country's workforce remains competitive in the global labor market.
- Establish partnerships with labor-receiving countries to negotiate favorable terms for Pakistani workers, such as securing quotas and ensuring smoother labor mobility for skilled workers.
- Focus on developing niche skills and sectors, such as halal food processing and Islamic finance, where Pakistan has a comparative advantage, positioning the country as a specialized provider of skilled labor in these emerging industries.
- Strengthen the role of the Bureau of Emigration and Overseas Employment Promoters (OEPs) in facilitating and promoting the employment of Pakistani skilled workers abroad. By actively collaborating with labor-receiving countries and supporting OEPs, the Bureau of Emigration can help ensure better labor mobility and create more opportunities for Pakistan's TVET graduates in the international job market.

- **Impact:**

Improved global competitiveness of Pakistani workers, ensuring consistent demand in international labor markets.

#### 4. Cultural Perception

- **Threat:** Persistent societal bias against vocational training as an inferior education path can limit youth participation.

- **Hedging Strategy:**

- Launch large-scale awareness campaigns highlighting the economic benefits of TVET and its role in creating employment opportunities.
- Partner with schools and communities to integrate TVET career guidance into secondary education curricula.
- Showcase successful TVET graduates as role models to inspire youth and shift cultural perceptions.

- **Impact:**

Increased acceptance of vocational training as a respectable career option, leading to higher enrollment rates.

#### 5. Fragmented Systems

- **Threat:** Weak coordination with provincial TEVTAs may lead to duplication of efforts and inconsistent quality standards.



- **Hedging Strategy:**
  - Develop a National TVET Coordination Framework to standardize policies, curricula, training program designs, and certifications across provinces, ensuring alignment and consistency in vocational education and training.
  - Create a unified digital management system to track the implementation and outcomes of TVET programs, providing transparency, efficiency, and real-time data on program progress, challenges, and achievements.
  - Encourage joint federal-provincial training and capacity-building programs to harmonize skill development efforts, fostering collaboration between regional and national authorities and ensuring that the TVET sector responds effectively to both local and national labor market needs
- **.Impact:**

A cohesive and well-coordinated TVET system, minimizing inefficiencies and ensuring high-quality training across the country.

### ***Pestel Analysis of Tvet Sector of Pakistan***

#### ***POLITICAL***

- **Government Policies and Support:** Pakistan's TVET sector has been influenced by shifts in political leadership and changing government priorities. While comprehensive policies, laws, and regulations exist at both the federal and provincial levels, their inconsistent implementation and lack of continuity often undermine their effectiveness. The federal government, through bodies like NAVTTC, has formulated frameworks such as the National Vocational Qualifications Framework (NVQF) and apprenticeship laws, while provincial authorities have developed regional strategies. However, these laws are not always fully enforced or aligned with the dynamic needs of the labor market, leading to inefficiencies. Additionally, frequent political transitions and changes in leadership can result in policy instability, further hindering the sector's growth. Without consistent and cohesive implementation, the TVET sector struggles to address skill gaps, improve workforce quality, and align with evolving industrial demands.
- **Decentralization after the 18th Amendment:** The 18th Amendment to Pakistan's Constitution led to the decentralization of several sectors, including education and vocational training. While this shift increased provincial autonomy, it also created significant challenges in terms of consistent implementation and coordination between federal and provincial entities.

- This has resulted in fragmented governance and uneven policy execution. Initially, the National Vocational and Technical Training Commission (NAVTTTC) was established in 2005 and placed under the Prime Minister's Secretariat to avoid bureaucratic delays. However, following the 18th Amendment, NAVTTTC was placed under the Ministry of Federal Education and Professional Training for administrative control. This change has caused delays in decision-making processes, as the commission's functions have become more entangled in bureaucratic procedures, affecting the speed and efficiency of policy execution and reform in the TVET sector.
- **Political Instability:** Political instability and changing priorities in Pakistan have had a significant impact on the long-term effectiveness of TVET reforms, particularly after the establishment of the National Vocational and Technical Training Commission (NAVTTTC) in 2005. While NAVTTTC was created with the aim of streamlining and improving vocational education and training across the country, its efficiency has been undermined by frequent shifts in political leadership and government priorities. Different political parties have had varying visions for the sector, leading to inconsistent policy implementation, fluctuating funding levels, and changing focal points of intervention.

For example, political transitions have led to shifts in the ministry under which NAVTTTC operates, from the Prime Minister's Secretariat to the Ministry of Federal Education and Professional Training, as mandated by the 18th Amendment. These changes in administrative oversight have disrupted continuity in decision-making processes, slowing down the implementation of key initiatives. Additionally, political changes have often led to the reallocation or reduction of funds for TVET programs, making it difficult for NAVTTTC to maintain momentum in its reforms or expand its programs.

Political instability also impacts the alignment of federal and provincial TVET policies, leading to a fragmented system. Since the implementation of vocational training was devolved to the provinces after the 18th Amendment, the lack of uniformity between federal and provincial TVET policies has resulted in disparities in the quality and reach of TVET programs. NAVTTTC's ability to coordinate these efforts has been hampered by provincial resistance to federal oversight, further exacerbating the challenges in implementing a cohesive national strategy for skill development.

In conclusion, political instability and frequent changes in leadership have significantly hindered the efficiency and continuity of NAVTTC's work. These factors contribute to inconsistent policy execution, inadequate funding, and a lack of focus on long-term strategies, limiting the potential of the TVET sector to meet the demands of Pakistan's evolving labor market.

### ***ECONOMIC FACTORS***

- **Skilled Labor Demand:** Pakistan's growing domestic industries, including construction, information technology (IT), manufacturing, and energy, have created an escalating demand for skilled labor. The rapid expansion of sectors like construction, driven by large-scale projects such as those under the China-Pakistan Economic Corridor (CPEC), has highlighted the need for workers trained in specific trades, including welding, carpentry, electrical work, and heavy machinery operation. Similarly, the growing IT sector requires technicians, software developers, network engineers, and cybersecurity experts, further increasing the demand for specialized TVET programs.

At the same time, Pakistan's international labor market also presents significant opportunities and challenges. Many Gulf Cooperation Council (GCC) countries, such as Saudi Arabia, the UAE, and Qatar, have large-scale infrastructure projects that demand skilled workers, especially in fields like construction, welding, electrical work, and heavy machinery operation. These countries, along with other labor-receiving countries globally, often seek qualified workers from Pakistan, making the development of a skilled labor force crucial not only for domestic economic growth but also for fulfilling international labor requirements. However, the lack of a sufficiently trained workforce in these sectors has resulted in skill shortages both domestically and in the international labor market. This shortage of skilled workers in high-demand sectors has led to missed opportunities in labor export, reducing the potential for remittances that are vital for Pakistan's economy.

The existing TVET system struggles to meet the demands of both domestic industries and the international labor market. There is a need for targeted training programs that align with the specific skill requirements of labor-receiving countries, as well as industry-specific certifications that are recognized internationally. Without these improvements, Pakistan may continue to face challenges in both providing the domestic workforce with employable skills and meeting the demand for skilled labor abroad.

As a result, policymakers must focus on enhancing TVET offerings, ensuring that the system not only addresses local industry requirements but also prepares workers for international job opportunities. Improving the quality of vocational training and certification, expanding international partnerships, and aligning training programs with global standards will be essential for meeting both domestic and international labor demands.

- **Unemployment Rates**

High unemployment rates, especially among the youth, pose a significant challenge to Pakistan's economy. The youth unemployment rate is a particularly alarming issue, with many young people lacking the skills necessary to enter the labor market. Pakistan's population is growing rapidly, with a significant portion of the population in the working-age group, yet the formal education system struggles to equip youth with job-relevant skills. In many cases, graduates from general education pathways do not possess the technical skills required by industries, leading to a mismatch between the education system and the labor market. TVET is seen as a key solution to this challenge, as it offers practical, hands-on skills that directly enhance employability. By equipping individuals with industry-specific skills, TVET programs can play a crucial role in reducing unemployment and creating a workforce that meets the needs of the economy.

- **Funding Limitations**

One of the significant barriers to the effective functioning of the TVET sector in Pakistan is limited government funding. Public sector investment in education, especially vocational training, is insufficient to meet the growing demand for skilled workers. Despite the recognition of TVET's importance in national economic development, budget allocations for TVET programs remain inadequate. This constraint limits the ability to improve infrastructure, upgrade training facilities, invest in modern equipment, and expand outreach to underserved regions.

Furthermore, Pakistan's heavy reliance on international donor funding—such as from organizations like the European Union (EU), British Council, GIZ, and USAID—highlights the country's economic constraints in sustaining and expanding TVET initiatives. While donor funding has played a crucial role in driving some TVET reforms, it often comes with specific conditions and is subject to the availability of resources from international partners. Additionally, dependence on external funding makes long-term planning and sustainability difficult, as donor-driven projects can be limited in scope and duration.

The lack of sufficient local funding not only hampers the development of new TVET infrastructure but also impacts the quality of education provided. The inability to modernize training programs and keep pace with technological advancements can leave graduates ill-prepared to meet the needs of a rapidly evolving job market. In the long term, this could undermine the effectiveness of TVET in addressing skill shortages and improving the employability of youth in Pakistan.

### ***SOCIAL FACTORS***

- **Cultural Perceptions**

In Pakistan, societal attitudes often favor traditional academic education over vocational training. This preference is deeply ingrained, with academic degrees perceived as status symbols and pathways to upward mobility, while vocational training is sometimes viewed as less prestigious. Consequently, many students and their families opt for general education, even though vocational skills offer better job opportunities in the labor market. This cultural bias limits TVET enrollment and hinders its growth, as students from lower-income and rural areas—who would benefit the most from skill-based training—often choose traditional educational paths due to societal pressure. Changing this perception requires widespread awareness campaigns highlighting the economic benefits and prestige of vocational skills, as well as success stories of TVET graduates excelling in various industries.

- **Gender Disparities**

Gender disparities significantly impact female participation in TVET programs. Cultural and societal barriers often restrict women's access to vocational training, particularly in fields traditionally dominated by men, such as construction, welding, and engineering. In many parts of the country, especially in conservative areas, women face considerable challenges accessing vocational training due to traditional gender roles, lack of safe learning environments, and the absence of women-centric training programs. Additionally, there are limited opportunities for women to engage in technical education in fields such as IT, mechanics, and heavy machinery operation, which are highly demanded both locally and internationally. This lack of inclusivity in TVET not only results in lower female participation but also restricts women's access to economic opportunities and financial independence. Addressing this issue requires the establishment of dedicated women's training centers, awareness programs about the importance of TVET for women, and the creation of supportive environments that challenge gender stereotypes and encourage women to participate in diverse vocational fields.

- **Youth Population**

Pakistan has one of the youngest populations globally, with a significant portion of its population falling within the working-age group. This youth demographic represents a tremendous opportunity for the TVET sector to address issues of unemployment and economic growth. However, despite this potential, the TVET sector has not yet fully capitalized on the opportunity to provide skills training to young people. High levels of youth unemployment—especially among graduates of traditional educational programs—underline the importance of vocational education. Many young people in Pakistan face difficulties securing employment due to a mismatch between their academic qualifications and the demands of the job market. TVET can bridge this gap by offering practical, hands-on skills training that directly aligns with industry needs. Furthermore, by fostering a skilled workforce, TVET can help stimulate economic growth, reduce poverty, and lower the unemployment rate among young people, who are currently the most vulnerable group in the labor market.

**Statistical Insights**

- **Youth Unemployment Rate:** As of 2023, the youth unemployment rate in Pakistan was approximately 9.65%, indicating a significant proportion of young individuals aged 15-24 are without employment. (Statista)
- **TVET Enrollment by Gender:** Data from 2004 to 2018 shows a disparity in TVET enrollment between genders. In 2018, approximately 234,000 males and 90,000 females were enrolled in TVET programs, highlighting a gender gap in vocational education. (UN-Women Asia-Pacific)
- **Female Enrollment in Specific Trades:** An analysis of the National Skilling Information System (NSIS) database revealed that female enrollment was concentrated in five trades: beautician, domestic tailoring, MS Office, professional cook, and fashion designing. Over 80% of female students were enrolled in these areas, indicating limited diversification in female participation.

**TECHNOLOGICAL FACTORS**

- **Technological Advancements:** The integration of technology into TVET programs is becoming increasingly important as Pakistan embraces digital transformation. Digital platforms, virtual learning environments, and e-learning modules are being introduced, often with the support of international donors such as the EU, GIZ, and USAID. These advancements have made training more accessible, particularly in remote and underserved areas where physical infrastructure for vocational training is limited.

For example:

**Digital Platforms and E-Learning:** Online platforms enable blended learning approaches, combining virtual and hands-on training. Programs delivered via Learning Management Systems (LMS) have enhanced flexibility and expanded reach.

**Simulators and Virtual Labs:** In high-demand trades like welding, heavy machinery operation, and electrical engineering, the use of simulators allows trainees to gain practical experience in a safe, controlled environment.

**Mobile Learning (m-Learning):** The widespread use of mobile devices in Pakistan opens opportunities for TVET institutions to deliver training through mobile apps, expanding access to technical education for those in rural areas.

**Skill Gaps** Despite the potential for technological integration, many TVET institutions in Pakistan are hindered by outdated infrastructure and limited access to modern equipment. The following challenges persist:

**Outdated Equipment:** A significant number of TVET centers still rely on traditional tools and equipment, which do not align with the advanced technologies used in industries today.

**Competency-Based Training (CBT):** The adoption of CBT curricula, which focuses on skills demanded by employers, is limited. Without updated and industry-relevant curricula, trainees often graduate with outdated skills, creating a mismatch between training outcomes and market needs.

**Digital Divide:** Rural and remote areas face connectivity issues, preventing equitable access to e-learning and other digital solutions. Institutions in these regions often lack the infrastructure needed to deliver technologically advanced programs.

**Innovation in TVET:** The growing emphasis on IT and digital skills presents a significant opportunity to modernize TVET programs in Pakistan. Emerging fields such as Robotics, Artificial Intelligence (AI), and Industry 4.0 are creating new avenues for innovation in vocational training:

**IT and Digital Skills Training:** Pakistan's growing IT sector demands a skilled workforce in areas like software development, cybersecurity, networking, and cloud computing. However, despite producing over **70,000 IT graduates annually**, only around **5,000 secure employments**, underscoring a significant gap between academic training and industry needs. Many graduates lack practical, industry-relevant skills due to outdated curricula and limited access to specialized short-term courses in fields such as artificial intelligence (AI), data analytics, and blockchain.

To address this, TVET programs must introduce concise, practical courses aligned with market demands. Partnerships with local and international IT firms can ensure curriculum relevance and provide hands-on training. Initiatives like intensive skill bootcamps, global certification opportunities, and mentoring programs can prepare graduates for both domestic roles and international freelancing opportunities. By bridging this skills gap, Pakistan can better position its IT graduates to meet global market demands, driving employment growth and boosting the country's economy.

**Robotics and AI:** Robotics and Artificial Intelligence (AI) are revolutionizing industries worldwide, making advanced technical skills critical for workforce competitiveness. In Pakistan, the incorporation of robotics, AI, and machine learning into TVET programs can address the growing demand for automation expertise in sectors like manufacturing, healthcare, and logistics. By integrating these cutting-edge subjects into vocational training, Pakistan's workforce can be equipped with the skills needed to excel in the global job market.

Targeted programs focusing on practical applications, such as robotics assembly, AI-driven process optimization, and machine learning algorithms, can position Pakistani workers as valuable assets in high-demand industries. Collaboration with tech firms and international educational partners can provide access to modern equipment, expert trainers, and industry-recognized certifications. These advancements will not only enhance local industry competitiveness but also open pathways for skilled labor export to automation-driven markets globally.

**Industry 4.0 Integration:** The adoption of smart manufacturing technologies, including IoT (Internet of Things) and data analytics, requires skilled workers. Updating TVET curricula to include these technologies will ensure that trainees are prepared for the future of work.

**Green Skills:** Renewable energy and sustainable practices are emerging sectors that require specialized training. Programs focusing on solar energy installation, wind turbine maintenance, and energy-efficient construction can align Pakistan with global trends in sustainable development.

#### ***ENVIRONMENTAL FACTORS***

- **Sustainability Focus** The global emphasis on sustainability and environmental preservation has created a demand for green skills, including training in renewable energy, waste management, and sustainable agriculture. As part of this trend, there is growing interest in incorporating green technologies into TVET curricula.



For example, skills in solar panel installation, wind turbine maintenance, and energy efficiency auditing are increasingly relevant in both domestic and international markets. Pakistan's renewable energy sector, driven by global climate goals and domestic energy shortages, offers significant opportunities for skilled workers in this domain.

- **Infrastructure Challenges:** Energy shortages and inadequate facilities, particularly in rural areas, are significant barriers to the effective development and delivery of TVET programs. Frequent power outages and limited access to modern training equipment hinder the practical learning experiences required in many vocational trades. Additionally, rural TVET centers often face difficulties in attracting qualified instructors and maintaining up-to-date infrastructure, leading to a disparity in training quality between urban and rural regions.
- **Disaster Impact:** Natural disasters, such as floods, earthquakes, and landslides, pose recurring challenges to Pakistan's TVET infrastructure. Regions like rural Khyber Pakhtunkhwa (KP) are particularly vulnerable, with floods frequently damaging educational facilities and disrupting training programs. The 2022 floods, for instance, devastated large parts of the country, displacing millions and destroying schools and training centers, leading to long-term interruptions in skill development efforts. Building disaster-resilient TVET infrastructure and implementing contingency plans are essential to ensuring program continuity in affected regions.

### **LEGAL FACTORS**

- **Legislation:** The NAVTTC Act, along with various provincial Acts and laws, provides a structured framework for technical and vocational education and training (TVET) in Pakistan. These legislations define the roles and responsibilities of relevant authorities, establish standards for curriculum development, and emphasize the importance of competency-based training (CBT). Despite these legal structures, enforcement remains inconsistent due to governance challenges, limited resources, and a lack of technical expertise among implementing bodies. For example, the NAVTTC Act seeks to harmonize TVET policies across the country, but its impact is diluted by fragmented coordination between federal and provincial entities following the 18th Amendment.
- **Labor Laws:** Key policies like the Apprenticeship Ordinance of 1962, the Federal Apprenticeship Act of 2018, and the Khyber Pakhtunkhwa Apprenticeship Act of 2022 aim to promote on-the-job training and formalize skill acquisition within industries. However, these laws need modernization to align with contemporary industry practices and international standards.

The Apprenticeship Ordinance, while foundational, is outdated and lacks provisions for emerging fields such as IT, renewable energy, and digital trades. The newer acts, such as KP's Apprenticeship Act, attempt to address these gaps but require stronger enforcement mechanisms and incentives to encourage employer participation in apprenticeship programs.

- **Regulation Challenges:** Pakistan's informal economy constitutes nearly 72% of the labor market, which operates largely outside the ambit of legal and regulatory frameworks. This sector often employs workers without formal training or certification, limiting the reach and effectiveness of TVET programs. Without regulatory oversight, workers in the informal sector miss out on structured skill development opportunities and recognition of their expertise. Additionally, the lack of integration of informal workers into the formal TVET ecosystem reduces overall workforce productivity and restricts access to higher-income opportunities.

### *GAP Analysis of TVET sector*

#### **1. Access and Inclusion**

- **Limited Training Opportunities in Underserved Areas:**

Many regions, particularly rural and underserved areas, lack adequate TVET infrastructure. This results in unequal access to training programs, leaving a significant portion of the population without opportunities to develop employable skills.

- **Gender Disparity in TVET Participation:**

Women's underrepresentation in TVET programs is a significant challenge, especially in the socio-cultural context of Khyber Pakhtunkhwa (KPK). Cultural biases, deeply rooted societal norms, and traditional gender roles often discourage women from pursuing vocational education and technical training. The situation is exacerbated by the lack of women-centric training centers that cater specifically to female learners. This limits their access to a safe and supportive learning environment.

#### **2. Curriculum and Industry Alignment**

- **Misalignment with Market Demands:**

The training programs often do not align with current labor market demands, leading to a mismatch between the skills provided by TVET institutions and those required by industries. Emerging fields like IT, renewable energy, and digital skills are particularly underrepresented.

- **Outdated Curricula:**

Conventional curricula and teaching methodologies fail to incorporate modern and competency-based training approaches, making TVET graduates less competitive in the global and national labor markets.

### 3. Quality Assurance and Certification

- **Weak Certification Systems:**

Poor international recognition of TVET certifications limits the employability of graduates abroad. Additionally, the prevalence of fake certifications undermines the credibility of the system.

- **Inadequate Training for Instructors and Assessors:**

Many instructors lack industry expertise or regular updates on technological advancements, reducing the quality of training provided.

### 4. Governance and Coordination

- **Fragmented Implementation:**

Overlapping roles and responsibilities between federal and provincial authorities lead to inefficiencies and policy conflicts. For instance, the dual governance structure hampers the development of a unified national strategy.

- **Insufficient Monitoring and Evaluation:**

There is a lack of robust mechanisms to monitor program outcomes and ensure accountability. This results in limited feedback loops for continuous improvement.

### 5. Resource Allocation

- **Low Budgetary Allocation:**

The funding for TVET is insufficient compared to its demand, resulting in inadequate facilities and infrastructure. The dependency on donor-driven initiatives further undermines sustainability.

- **Inefficiency in Resource Utilization:**

Overlapping training programs funded by various agencies often lead to duplication of efforts, waste of resources, and ineffective outcomes.

### 6. Post-Training Support

- **Lack of Job Placement Services:**

Many graduates struggle to find employment due to the absence of active job placement centers or career counseling facilities. Weak industry-academia linkages exacerbate this issue.

- **Insufficient Support for Entrepreneurship:**

While entrepreneurship is identified as a priority, practical support such as access to microfinance or mentorship programs remains inadequate.

## 7. Social Perceptions

- **Negative Public Perception:**

TVET is often viewed as inferior to traditional academic education, deterring enrollment and societal support. This stigma needs to be addressed through public awareness campaigns

### *GAP Analysis of the 2018 National TVET Policy of Pakistan*

Policy Objective	Current Status	Identified Gaps	Recommendations
<b>1. Skills development for economic growth and youth employment</b>	Various skills development training programs are available at both the federal and provincial levels; however, they often lack alignment with key economic priorities and comprehensive youth employment strategies.	1. Limited focus on emerging industries such as IT, AI, and renewable energy. 2. Insufficient outreach in rural areas and for marginalized communities.	1. Align skills development initiatives with high-growth sectors like IT, renewable energy, construction and logistics. 2. Increase outreach to rural and underserved populations through regional TVET centers and awareness campaigns.
<b>2. Increase the number and quality of training opportunities to train at least one million annually</b>	Training capacity has increased but remains far below the target. Private sector engagement is sporadic.	1. Public training centers lack infrastructure and modern equipment to full fill the demand from the local and international. 2. Private sector partnerships are insufficiently formalized.	1. Invest in modernizing public TVET centers with updated facilities. 2. Strengthen public-private partnerships (PPPs) with incentives like tax breaks and co-developed training programs.
<b>3. Introduce national standards-based qualification, assessment, and certification systems</b>	The Pakistan National Vocational Qualifications Framework (PNVQF) has been developed but its implementation is inconsistent.	1. Weak enforcement of national standards across provinces, implemented. 2. Limited global recognition of qualifications.	1. Ensure nationwide enforcement of NVQF with monitoring mechanisms. 2. Align certifications with international standards to improve global recognition and

Policy Objective	Current Status	Identified Gaps	Recommendations
			labor mobility.
<b>4. Design and deliver competency-based education and training (CBT) programs</b>	CBT&A programs have been initiated but are not widely adopted due to conventional curricula and limited faculty training.	1. Conventional curricula that fail to align with current labor market needs only level 2 and Level 3 are implemented. 2. Insufficiently trained instructors to deliver CBT programs effectively.	1. Modernize curricula with industry collaboration. 2. introducing level 4 & 5 CBT&A Qualifications implementation across the country. 3. Launch extensive Training-of-Trainer (ToT) programs to prepare instructors for CBT delivery.
<b>5. Forge new public-private partnerships for direct training and contributions to TVET</b>	Some partnerships exist but lack scalability and long-term commitment.	1. Weak collaboration frameworks between the public and private sectors. 2. Private sector reluctance due to unclear benefits.	1. Create formalized PPP models with clear roles, benefits, and incentives. 2. Establish sector-specific advisory councils to strengthen industry participation.
<b>6. Maintain and expand the export of labor with internationally recognized qualifications</b>	Labor export remains significant, especially to Gulf countries, but qualifications are not widely recognized globally.	1. Inadequate alignment of TVET certifications with international standards. 2. Limited emphasis on language and cultural training for global labor markets.	1. Standardize certifications based on international frameworks. 2. expand the KSA Takamol Certification and assessment system in other countries. 3. Include language and soft skills training for countries like GCC, EU, and Southeast Asia.
<b>7. Linkages with the informal sector to formalize skills acquired informally</b>	Recognition of Prior Learning (RPL) programs have been introduced but have limited coverage and awareness.	1. Low integration of informal workers into formal systems. 2. Limited outreach and awareness about RPL programs among informal	1. Expand RPL programs with outreach initiatives targeting informal workers. 2. Partner with employers to encourage formal recognition of

Policy Objective	Current Status	Identified Gaps	Recommendations
		workers and employers.	informal skills.
8. Reform and revitalize the public TVET sector	Efforts to reform the public TVET sector are ongoing but face challenges in resource allocation, implementation, and human resource development.	1. Inconsistent implementation of reforms across provinces. 2. Resource and funding limitations impede modernization efforts.	1. Allocate dedicated funding to modernizing infrastructure and faculty training. 2. Regularly evaluate reforms and adapt based on performance and outcomes.

### *Gap Analysis of Pakistan TVET Policy vis-à-vis India, China, Indonesia and Malaysia*

A detailed gap analysis of Pakistan's TVET (Technical and Vocational Education and Training) policy compared to those of India, China, Malaysia, and Indonesia highlights several areas where Pakistan lags behind in terms of strategy, implementation, and outcomes. Pakistan's TVET policy primarily focuses on increasing enrolment and unifying standards but lacks a comprehensive approach to integrating industry needs, technology, and global competitiveness. For instance, India's *Skill India* initiative is a robust model that leverages public-private partnerships, promotes industry-aligned training, and implements large-scale skill development programs, ensuring alignment with labor market demands. China has effectively linked its TVET policy with its industrial strategy, emphasizing cutting-edge technologies and fostering strong collaborations between enterprises and educational institutions, which ensures the workforce is prepared for high-value industries like advanced manufacturing. Malaysia's TVET system is globally oriented, focusing on international accreditation, quality assurance, and promoting lifelong learning, making its workforce competitive on an international scale. Indonesia, on the other hand, prioritizes addressing regional skill disparities while integrating digital and entrepreneurial skills into its TVET programs to prepare for a tech-driven future. Pakistan, in comparison, needs to enhance its industry linkages, adopt international standards, incorporate advanced technology into its training programs, and address regional imbalances to make its TVET system more effective and globally relevant. These changes are critical for meeting the challenges of a rapidly evolving global economy and securing economic growth through a skilled workforce.

## *Comparative Analysis*

Technical and Vocational Education and Training (TVET) plays a crucial role in equipping individuals with the practical skills and knowledge needed to meet labor market demands. In developing and emerging economies, where unemployment and underemployment are significant challenges, an efficient TVET sector can enhance productivity, foster innovation, and drive economic growth.

Pakistan, India, Bangladesh, and China are all countries with unique economic dynamics, population sizes, and developmental priorities. While they share similar aspirations of fostering a skilled workforce, the scope, challenges, and investments in their TVET sectors differ significantly. These differences reflect not only their respective economic capacities but also their strategic focus on skill development and workforce readiness.

### *Key Indicators for Analysis*

To understand the status and performance of the TVET sector in these countries, the following indicators are considered:

1. **GDP Per Capita** – Reflecting the average income and economic development level, which influences investment in education and skills development.
2. **Currency** – Highlighting the economic context and monetary stability.
3. **Total Government Budget** – Indicating the resources available to address national development priorities.
4. **Education Budget** – Signifying the importance of education within national policymaking.
5. **TVET Budget** – Representing the specific allocation for technical and vocational training.
6. **TVET Enrollment** – A measure of the reach and accessibility of vocational training programs.
7. **Remittance** – Indicating the role of migrant workers, many of whom may rely on TVET for employability abroad.
8. **Remittance as a Percentage of GDP** – Reflecting the economic dependence on expatriate workers.

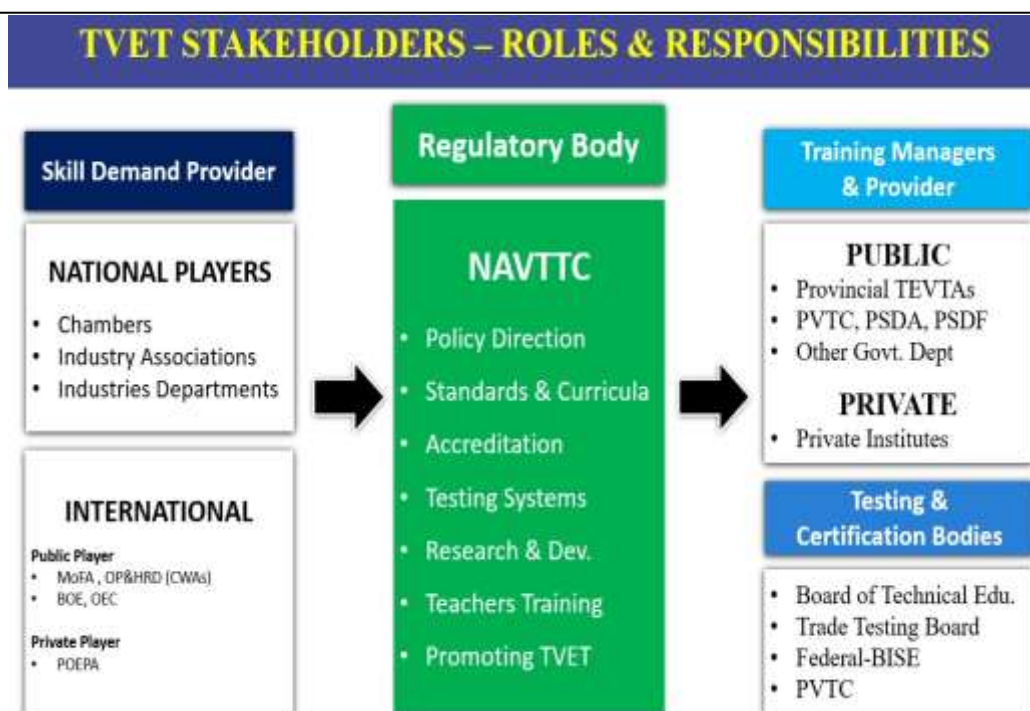
The comparative analysis provides insights into how these countries prioritize and structure their TVET sectors. Understanding these dynamics helps identify best practices and potential areas of improvement for countries like Pakistan, which faces a pressing need to enhance skills development amidst a burgeoning youth population. It also highlights how economic factors and government priorities shape TVET systems, influencing labor market outcomes and economic growth.

COMPARATIVE ANALYSIS				
Indicator	PAKISTAN	INDIA	BANGLADESH	China
GDP Per Capita (WB 2023)	USD 1,505	USD 2,484	USD 2,529	USD 12,514
Currency	USD 1 = 280 PKR	USD 1 = 83.9 INR	USD 1 = 111 BDT	USD 1 = 7.3 Yuan
Total Budget USD in Billion	51.4 B	530 B	68.5 B	6.2 TR
Education Budget USD in Million	4,468 M	13,670 M	5164 M	90,6000 M
TVET Budget USD in Million	114.5 M 2.4% of Education	418.8 M 3.12% of Education	700.2 M 13.6% of Education	49500 5.4% of Education
TVET Enrollment WB 2023	3.1%	3.4%	6.2%	18.5%
Remittance USD in Million	26,300	120,000	21,600	49,500
Remittance % of GDP	7.8%	3.4%	5.1%	1%

### Stakeholders Analysis

The TVET sector in Pakistan, particularly at the federal level and in Khyber Pakhtunkhwa (KPK), involves a range of stakeholders across policy, implementation, and certification. At the federal level, NAVTTC leads policy formulation, standardization, and national coordination. In KPK, KP-TEVTA manages the implementation of vocational training programs aligned with regional needs, focusing on sectors like agriculture, mining, and small-scale manufacturing. Qualification Awarding Bodies (QABs), including provincial technical education boards like the Khyber Pakhtunkhwa Board of Technical Education (KPBTE), Trade Testing Boards (TTBs) and ensure standardized certifications. Employers, industries contribute to aligning TVET with labor market needs, while private training providers and NGOs play critical roles in extending training to underserved areas. International development partners like EU/GIZ, UNHCR and the World Bank, along with the federal Skills for All Strategy enhance infrastructure, curricula, and instructor training to improve TVET outcomes in both federal and provincial contexts.





### *Issues and Challenges*

#### **1. Overlapping Training and Trainees Across Different Agency-Funded Training Projects.**

Over 200 billion rupees are being spent by various programs, including provincial TVETAs, PSDF, NAVTTC Youth Skill Programs, Digi Skills and EU/GIZ. This situation arises because the same technical training institutes are approached through multiple training advertisements. Due to a lack of coordination among these agencies, these institutes often submit bids for training contracts to secure funding from multiple sources simultaneously. Unfortunately, many of these institutes lack the capacity and sufficient enrollment to deliver effective training. As a result, the same private institutes owned by TVETAs win the bids and receive funding, claiming they can accommodate 100 trainees. However, they utilize the same youth and courses to extract funds from NAVTTC, PSDF, and EU programs. This leads to a situation where many trainees become accustomed to receiving free training, taking advantage of the system. This fraudulent practice occurs due to overfunding and the limited capacity to train youth effectively at the ground level.

#### **2. Multiple Funding for Developing TVET Curricula/Qualifications**

NAVTTC has developed qualifications and curricula in over 75 trades and sectors. Similarly, with the support of EU-GIZ under the TSPP, over 350 qualifications and curricula have been created.

Currently, some IT sector qualifications are being developed through TVET Sector Support Program (British Council Component) recently approved, resulting in significant waste of resources due to a lack of coordination and overlapping efforts.

**3. Training of Trainers (TOT) Same Teacher/Instructor Being Trained by Multiple Funding Agencies**

The TVET sector in Pakistan is plagued by inefficiencies in teacher training programs due to low absorption capacity and overlapping initiatives by funding agencies such as GIZ-EU, TEVTAs, British Council, DigiSkills, and NAVTTC. While these agencies prioritize teacher training, the lack of coordination results in repetitive training for the same individuals, often selected based on personal relationships rather than merit or need. Additionally, relevant provincial bodies are frequently chosen on the basis of favoritism, making the situation worse. This practice sidelines deserving TVET trainers and instructors while including irrelevant participants, such as university professors and school teachers with no direct link to the vocational training field. These gaps in planning and execution undermine the quality and impact of training programs, leaving the sector ill-equipped to meet its goals.

**4. Misalignment of Curriculum with Industry Needs**

The curriculum often fails to align with current labor market demands, producing graduates who may be either underqualified or overqualified for available positions. This issue stems from weak partnerships between technical institutions and industries, limiting the program's ability to effectively prepare participants for relevant jobs.

**5. Malpractices and Bureaucratic Inefficiency in Skills Development Programs**

Corruption within the program and bureaucratic inefficiencies lead to resource misallocation, implementation delays, and reduced accountability. Many centers have a capacity to support minimum/limited trainees but are awarded contracts for maximum, resulting in excess funds that are distributed among monitoring and implementation agency employees. Consequently, around half of the funding goes into the pockets of high-ranking officials and staff illegitimately.

**6. Lack of Follow-Up and Post-Training Support**

Under the Technical and Vocational Education and Training (TVET) Sector Support Programme (TSSP), GIZ established 130 Job Placement Centers and Career Counseling (JPC & CC) facilities across Pakistan to support graduates in finding relevant employment and utilizing their skills. However, many of these centers are not functional, leaving graduates without adequate post-training support.

As a result, they often struggle to transition into the workforce, find relevant employment, or effectively utilize their acquired skills. The absence of active job placement services, career counseling, and mentorship programs significantly limits the potential impact of TVET initiatives, creating a gap between training and employment opportunities.

**7. Shortage of Qualified Trainers/Instructors/Assessors**

The TVET program in Pakistan faces a critical shortage of trained and experienced instructors, trainers, and assessors, which significantly impacts the quality of vocational training and assessment. Many instructors and assessors lack the necessary industry expertise and practical skills to deliver effective and up-to-date training or conduct Competency-Based Training and Assessment (CBT&A) effectively. This deficit not only hinders the delivery of high-quality education but also limits the alignment of TVET programs with industry standards, reducing their relevance and employability outcomes for TVET graduates.

**8. Massive Fake certifications in TVET Sector**

The prevalence of fake certifications significantly undermines trust in Pakistan's TVET system, creating serious challenges for genuine graduates in securing employment both locally and internationally. This issue compromises labor quality, as untrained individuals with counterfeit credentials enter skilled sectors, negatively affecting productivity and workplace safety. In Gulf countries, where many Pakistani workers seek employment, skepticism about the authenticity of certifications has led to stricter verification processes, reducing job opportunities and impacting remittances. Moreover, the widespread presence of fake certificates damages Pakistan's international TVET reputation, deterring global partnerships, funding, and recognition of its skilled workforce.

**9. Social Stigma Around Technical Vocational Education and Training**

Social biases associating technical and vocational education with lower economic status discourage many from participating. This stigma negatively impacts enrollment, reducing the reach and effectiveness of vocational training initiatives.

**10. Weak Monitoring and Evaluation Mechanisms**

The TVET program lacks a robust monitoring and evaluation framework, making it difficult to assess impact, address ongoing challenges, or implement continuous improvements. This gap in oversight hinders effective implementation and progress tracking

**11. Implementation of Apprenticeship Laws at Federal and Provincial Levels with a Focus on Khyber Pakhtunkhwa (KPK)**

The implementation of apprenticeship laws at the federal and provincial levels, particularly in Khyber Pakhtunkhwa (KPK), faces significant challenges due to the absence of well-defined and relevant rules. Without these rules, it becomes difficult to operate the laws effectively and ensure uniform compliance across the board.

**12. Mismatch Between Training and Market Needs:**

The KPK TVET programs often do not align with the specific demands of local industries, such as mining, agriculture, and construction, resulting in a skills gap.

**13. Absence of Modern Training Facilities:**

The majority of TVET institutes in KPK do not have the specialized machinery, laboratories, or simulators required for hands-on training in mining-related trades.

- 14. Extending NAVTTC's Mandate to Regulate Levels 6-8 in Technical Education:** Under the National Vocational Qualification Framework (NVQF), Levels 1-5 certifications are within NAVTTC's mandate, while Levels 6-8 degrees are awarded by universities accredited by the Higher Education Commission (HEC). The NAVTTC Act 2011 designates NAVTTC as the regulatory authority for the TVET sector, with NVQF outlining a shared mandate for NAVTTC and HEC in managing higher-level qualifications. Currently, technical universities accredited by HEC are responsible for awarding Level 6-8 degrees, reflecting the collaborative framework established between NAVTTC and HEC.

To streamline the regulation of technical education in Pakistan and ensure alignment with the National Vocational Qualification Framework (NVQF), it is proposed that NAVTTC expand its mandate to include the regulation and awarding of Level 6-8 degrees, along with the accreditation of universities offering these programs. This centralized approach would bring all levels of technical education under NAVTTC's governance, complementing its existing responsibility for Levels 1-5 as outlined in the NAVTTC Act 2011. By consolidating oversight, NAVTTC can ensure consistency, quality assurance, and standardization across technical education. Additionally, this initiative will align programs with current labor market demands, ensure they meet international standards, and strengthen Pakistan's standing in global vocational and technical education. Key actions include expanding NAVTTC's mandate to regulate Levels 6-8, accrediting universities offering technical degrees, centralizing technical education oversight for quality assurance, and aligning education with industry needs and international benchmarks.

## *Conclusion*

The simulation exercise critically evaluated the current policies and practices in the Technical and Vocational Education and Training (TVET) sector in Pakistan, focusing on their impact on employment and industry. The analysis highlighted key gaps in alignment between TVET programs and labor market demands, issues in governance, weak industry-academia linkages, resource limitations, and significant challenges in implementation due to overlapping responsibilities and mismanagement. These challenges have contributed to the persistent skills mismatch, underutilization of the youth potential, and unemployment.

Despite policy reforms like the National Skills Strategy and the establishment of bodies such as NAVTTC and provincial TEVTAs, the sector struggles with insufficient scalability, outdated curricula, and inadequate infrastructure. This has hampered the employability of the youth and affected the competitiveness of the workforce both nationally and internationally. The SWOT, GAP, and EETH analyses further underscored the need for systemic reforms, improved governance, and enhanced resource allocation to revitalize the TVET sector.

## *Recommendations*

### **1. Policy and Governance Reforms:**

- Strengthen inter-agency coordination at federal and provincial levels to eliminate policy overlaps and inefficiencies.
- Fully enforce existing legal frameworks like the NAVTTC Act and Apprenticeship Acts to ensure accountability.
- Establish a comprehensive quality assurance framework for consistency in training and certification.
- Matric Tech' Pathways for Integrating Technical and Vocational Education and Training (TVET) and formal education across the country.

### **2. Curriculum and Training Alignment:**

- Update and align curricula with market needs, focusing on high-demand sectors like IT, renewable energy, and construction.
- Promote competency-based training and integrate modern teaching methodologies, including e-learning platforms.
- Encourage industry participation in curriculum design and program delivery to ensure relevance.
- Implementation of Level 4 and Level 5 CBT Qualifications across the country in phases.

**3. Resource Allocation and Infrastructure Development:**

- Increase funding for the TVET sector and prioritize resource allocation for infrastructure development.
- Expand training facilities in underserved regions, ensuring inclusivity and access for marginalized groups.

**4. Capacity Building:**

- Regularly train and certify TVET instructors in both pedagogical and technical skills to enhance the quality of training delivery.
- Organize comprehensive CBT&A training for instructors, assessors, and principals across public and private sectors to ensure alignment with competency-based standards.
- Streamline and enforce the National Assessors Registration Process nationwide with clear criteria, transparent procedures, and digital platforms for efficient and inclusive registration.

**5. Technology Integration:**

- Simulator-based training is particularly valuable in high-demand technical fields such as welding, heavy machinery operation, electrical work, and the automobile sector.
- Incorporate digital and green skills into training programs to meet the demands of a rapidly evolving market.
- Utilize digital tools for monitoring, evaluation, and data-driven decision-making.

**6. Public Perception and Social Awareness:**

- Develop an effective communication strategy to change the societal perception of TVET as inferior to traditional education.
- Highlight success stories to inspire youth and promote vocational training as a viable career path.

**7. Job Placement and Post-Training Support:**

- Revitalize job placement centers and career counseling facilities to provide graduates with employment opportunities and guidance.
- Establish mentorship programs and incentivize industries to offer internships and apprenticeships programs.

**8. Addressing Fraud and Certification Issues:**

- Implement stricter verification processes to combat the issue of fake certifications.
- Collaborate with international bodies to regain trust in the credibility of Pakistan's TVET certifications.
- Expand RPL programs with outreach initiatives targeting informal workers.

**9. Gender Inclusivity:**

- Introduce women-centric programs and expand training facilities for females to ensure equal participation.
- Provide financial assistance and incentives to encourage female enrollments

**10. Private Sector and International Partnerships:**

- Foster public-private partnerships for funding, training, and employment opportunities.
- Align certifications with international standards to boost global employability and remittances

**11. Extending NAVTTC's Mandate to Regulate Levels 6-8 in Technical Education:**

- To extend NAVTTC's mandate to regulate and award Level 6-8 degrees, transferring accreditation authority for technical universities from HEC to NAVTTC. This will ensure centralized governance, standardization, and alignment of technical education with labor market and international standards.

**LOG FRAME**

S.no	Activity	Agency	Time frame
1	Strengthening Coordination among Federal and Provincial entities	NAVTTTC and Provincial TEVTAs	1-3 years
2.	Enforcement of Legal Frameworks	NAVTTTC and TEVTAs	1-3 years
3	Establishing Quality Assurance Framework for Training and certification	NAVTTTC	1-3 years
4	Metric tech Pathways	NAVTTTC	5-7 years
5	Curriculum Alignment with Market needs	NAVTTTC	3-5 years
6.	Promote Competency Based Training	NACTTC & TEVTAs	3-5 years
7	Industry Participation in Curriculum design	NAVTTTC & Industries	3-5 Years
8	Implementation of Level 4 & 5 CBT qualification	NACTTC & TEVTAs	1-3 years
9	Increase Funding for TVET sector	Finance Division/ NAVTTTC & TEVTAs	5-7 years
10	Expand Training facilities in under privileged regions	NAVTTTC & TEVTAs	1-3 years
11	Continuous Professional Development of Trainers on pedagogy	NAVTTTC & TEVTAs	5-7 years
12	Comprehensive CBT for instructors, assessors and principals	NAVTTTC & TEVTAs	3-5 years
13	Streamlining National Assessors registration process	NAVTTTC	1-3 years
14	Simulator based Training	NAVTTTC	5-7
15	Incorporating Green Skills in Training Programs	NAVTTTC & TEVTAs	3-5 years
16	Utilization of Digital tools for M&E	NAVTTTC & TEVTAs	1-3 years



17	Development of Communication Strategy of social perception	NAV TTC	1-3 years
18	Highlight success stories for inspiration	NAV TTC & TEVTAs	1-3 years
19	Revitalize Job Placement centers and Career Counselling	NAV TTC and TEVTAs	1-3 years
20	Establish Mentorship Program and incentivize industries	NAV TTC & TEVTAs	1-3 years
21	Implement strict verification process for fake certification	NAV TTC	1-3 years
22	Collaborate with international bodies to regain trust	NAV TTC	5-7 years
23	Expand RPL programs	NAV TTC & TEVTAs	1-3 years
24	Introduce Women Centric Programs	NAV TTC & TEVTAs	1-3 years
25	Financial Assistance and Incentives to encourage female enrolment	NAV TTC & TEVTAs	1-3 years
26	Foster PPP for funding, training and employment Opportunities	NAV TTC & TEVTAs	1-3 years
27	Align certification with International Standards	NAV TTC	3-5 years
28	Award of Degree to Level 6-8 degree by NAV TTC	NAV TTC and HEC	3-5 years

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# Analyzing Policies and Practices Shaping IT Exports and Freelancing Economic Impact on Pakistan

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Pakistan's IT and freelancing sectors play a pivotal role in the country's economic growth and digital transformation. The IT industry, supported by government initiatives like tax incentives, foreign investment facilitation, and technology collaborations, has significantly expanded, with projected revenues of \$20 billion by 2025. Similarly, the freelancing sector has positioned Pakistan among the global leaders, with 42% of freelancers contributing to software development. Despite these advancements, challenges such as inadequate infrastructure, energy shortages, and regulatory barriers hinder further growth. Strategic reforms are imperative, including enhancing cybersecurity, simplifying taxation, and introducing global payment gateways. Investments in reliable infrastructure, inclusive skill development programs like DigiSkills, and fostering innovation can unlock the sector's full potential. By addressing these issues, Pakistan can capitalize on its demographic advantage, becoming a global leader in the digital economy. This analysis underscores the sectors' potential and highlights reforms necessary for sustainable growth.

## Key words:

IT industry, freelancing, economic growth, Pakistan, digital transformation

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## ***Introduction***

The IT and freelancing sectors are critical for Pakistan's economic growth. As of January 2025, Pakistan's Information Technology (IT) and freelancing sectors have emerged as significant contributors to both the national and global digital economies.

### ***Information Technology Industry in Pakistan***

Pakistan's IT industry has experienced substantial growth, with the government targeting the Information and Communication Technology (ICT) sector to reach a size of \$20 billion by 2025, in line with Pakistan Vision 2025 and the Digital Policy of Pakistan 2018 (Board of Investment, 2025)<sup>7</sup>. The industry comprises over 12,000 IT companies, contributing approximately \$2.1 billion in export revenue and \$1.2 billion in domestic revenue (P@SHA, 2025)<sup>8</sup>. Notably, the software market in Pakistan is projected to achieve a revenue of \$1,045 million in 2025, with enterprise software being a significant segment (Statista, 2025)<sup>9</sup>.

Government initiatives have played a crucial role in fostering this growth. Incentives such as zero income tax on IT exports until June 2025, 100% equity allowed for foreign investors, and full repatriation of profits have created a conducive environment for investment and expansion (Ministry of IT & Telecom, 2025)<sup>10</sup>. Additionally, collaborations with global tech companies have further bolstered the sector. For instance, Allied Corporation, an Adelaide-based PC maker, entered a \$200 million deal with Google to manufacture over 500,000 Chromebooks for Pakistan's education system by 2025, aiming to enhance classroom technology and digital enterprises (The Advertiser, 2024).

### ***Freelancing Industry in Pakistan***

The freelancing industry in Pakistan has witnessed remarkable expansion, positioning the country among the top freelancing nations globally. According to the World Bank, 42% of Pakistani freelancers are engaged in software development, representing 10% of the global freelancers (Modern Diplomacy, 2024)<sup>11</sup>. The government's National Freelance Facilitation Policy aims to train 1 million freelancers in the coming years, reflecting a commitment to further developing this sector (Being Guru, 2024)<sup>12</sup>.

Despite its growth, the freelancing industry faces challenges, including digital infrastructure limitations and energy shortages. To address these issues, the government has initiated programs like the Prime Minister Laptop Scheme and introduced financing options such as Kistpay and Qistbazaar to facilitate access to necessary tools for freelancers (Pakistan Today, 2024)<sup>13</sup>.

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<sup>7</sup> <https://invest.gov.pk/it-ites>

<sup>8</sup> <https://www.pasha.org.pk/industry-overview>

<sup>9</sup> <https://www.statista.com/outlook/tmo/software/pakistan>

<sup>10</sup>

<https://moitt.gov.pk/SiteImage/Misc/files/Pakistan%27s%20IT%20Industry%20ReportPrinter.pdf>

<sup>11</sup> <https://modern diplomacy.eu/2024/05/07/the-flip-side-of-freelancing-industry-of-pakistan/>

<sup>12</sup> <https://www.beingguru.com/how-to-start-freelancing-in-pakistan-2025>

<sup>13</sup> <https://www.pakistantoday.com.pk/2024/08/21/overview-of-freelancing-industry-of-pakistan/>

## *Problem Statement*

Though, Pakistan has made concerted efforts to promote IT and Freelancing Industry in Pakistan and to give optimal exposure to Youth Bulge enabling them to be part of digitally active nation. However, the situation necessitates that Public and private multi-stakeholders make concerted efforts to face challenges confronted by IT and Freelancers sector especially from foreign states. Therefore, this policy analysis will study and develop effective strategies to increase IT exports and Freelancing through its abundant resource pool for overall economic growth.

## *Situational Analysis*

Pakistan has emerged as the fourth largest freelancing market globally, recognized for its competitive rates and high-quality work. The country has become a preferred destination for outsourcing in various fields such as app development, software engineering, and creative industries (World Bank, 2023). The government has introduced the National Freelance Facilitation Policy, which aims to train 1 million freelancers by 2027, with a focus on advanced technical and soft skills (Ministry of IT and Telecommunication [MoITT], 2023).

Infrastructure improvements, such as the establishment of freelancer co-working spaces and the facilitation of payment platforms like Payoneer, have played a pivotal role in supporting freelancing growth (Ali et al., 2023). Moreover, government-backed initiatives like DigiSkills.pk have trained over 2.5 million individuals in freelancing and digital skills since their inception, significantly contributing to the workforce (DigiSkills, 2023).

Universities and private institutions have also integrated freelancing courses into their curriculums, ensuring that students are equipped with relevant skills for the gig economy. Pakistani freelancers have achieved notable success, securing major international clients and contributing to large-scale projects. Additionally, individual freelancers have gained global recognition for their accomplishments, mentoring others and building a thriving community (Rehman & Shah, 2023).

### *Current Landscape of IT Exports and Freelancing in Pakistan*

Pakistan's burgeoning IT and freelancing sectors significantly contribute to the global digital economy by providing cost-effective and skilled labor. The country's young and talented workforce, with over 25,000 IT graduates entering the job market annually, positions Pakistan as a favorable destination for IT outsourcing (GENTEC, 2024). Furthermore, the expansion of freelancing is boosting Pakistan's economic growth, with the country now ranking fourth in terms of freelancing activity (Eurasia Review, 2024). The IT and freelancing industry contribute significantly to Pakistan's economy in several ways:

- i. **Employment Generation:** Both IT sector and freelancing community have created millions of job opportunities, especially for young individuals. The IT sector alone employs over 300,000 professionals, while freelancing provides income to a large portion of the workforce (Khan, 2023).

- ii. **Foreign Exchange Earnings:** The exports from the IT sector and the remittances earned by freelancers play a vital role in boosting the country's foreign exchange reserves. The increasing demand for IT services and digital solutions has the potential to further augment these earnings.
- iii. **Human Capital Development:** The growth of the IT sector has led to the development of a highly skilled workforce in Pakistan. Educational institutions and online platforms have played a key role in training individuals in relevant technical skills, such as software development, data analysis, and cybersecurity.
- iv. **Boost to Entrepreneurship:** The rise of freelancing and IT startups has fostered an entrepreneurial ecosystem, encouraging young professionals to create their own businesses. This has led to the creation of small and medium-sized enterprises (SMEs), which further contribute to job creation and innovation.

As of January 2025, Pakistan's Information Technology (IT) exports and freelancing sectors have demonstrated significant growth, contributing notably to the national economy. In the fiscal year 2023-2024, Pakistan's IT exports reached \$3.223 billion, marking a 24% increase compared to the previous fiscal year (Source: Pakistan Today)<sup>14</sup>. This upward trend continued into the subsequent fiscal year, with IT services exports totaling \$286.395 million in July 2024, reflecting a 33.84% increase from July 2023 (Source: WAM)<sup>15</sup>. By September 2024, monthly IT exports had risen to \$292 million, a 42% year-on-year increase, marking the 12<sup>th</sup> consecutive month of growth (Source: Profit by Pakistan Today)<sup>16</sup>.

### *Freelancing Sector*

Pakistan's freelancing industry has also experienced substantial expansion. As of May 2024, the country had approximately 2.37 million active freelancers, with 0.55 million working full-time, each having completed at least 10 projects and earned over \$1,000 (Source: Modern Diplomacy)<sup>17</sup>. In the fiscal year 2023-2024 (July-March), Pakistani freelancers contributed \$350.15 million in foreign exchange earnings (Source: ProPakistani)<sup>12</sup>. The freelancing sector has become a vital component of Pakistan's economy, fostering digital entrepreneurship and diversifying economic activities. With over 1.5 million freelancers, the country has witnessed a surge in digital entrepreneurship, reshaping traditional employment paradigms (Source: The Express Tribune)<sup>18</sup>.

<sup>14</sup> <https://www.pakistantoday.com.pk/2024/08/21/overview-of-freelancing-industry-of-pakistan/>

<sup>15</sup> <https://www.wam.ae/en/article/144snbi-pakistans-services-exports-surge-3384-2864-million>

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<sup>17</sup> <https://moderndiplomacy.eu/2024/05/07/the-flip-side-of-freelancing-industry-of-pakistan/> <sup>12</sup> <https://propakistani.pk/2024/06/11/heres-how-much-pakistani-freelancers-earned-duringfy24/>

<sup>18</sup> <https://tribune.com.pk/story/2492783/freelancing-providing-digital-lifeline-for-pakistanseconomy>

### *Statistical and growth trends analysis of IT exports*

Pakistan's Information Technology (IT) sector has demonstrated significant growth in recent periods. In the fiscal year 2023-2024, IT exports reached \$3.2 billion, marking a 24% increase from the previous year's \$2.59 billion (Source: Dawn)<sup>19</sup>. In July 2024 alone,

IT services exports totaled \$286.395 million, reflecting a 33.84% rise compared to July 2023 (Source: WAM)<sup>20</sup>. By December 2024, monthly IT exports achieved a record \$348 million, up by 15% year-on-year and 12% month-on-month (Source: Arab News)<sup>16</sup>.

Pakistan's IT exports predominantly include software development, IT-enabled services (ITES), and call center services. Software development and outsourcing are the leading contributors, driven by demand from markets such as the United States, the European Union, and the Middle East. Pakistan ranks among the top outsourcing destinations globally due to its competitive pricing and a skilled labor force (Ahmad et al., 2022). IT services form a significant part of the services export segment, making IT a critical sector in the country's economy.

The government has introduced several policies to support the IT sector, including a zero-income tax policy for IT and ITES exports until 2025 (Pakistan Software Export Board [PSEB], 2023). Additional measures include allowing 100% foreign equity ownership, profit repatriation, and initiatives such as PSEB's programs for company registrations and certifications (PSEB, 2023). Over 25,000 IT graduates enter the workforce annually, meeting the growing demand for skilled labor in IT exports (Ahmed, 2023).

Freelancers also contribute significantly, with Pakistan ranking 4th globally in freelancing activities (World Bank, 2023). Pakistani IT companies are increasingly adopting cutting-edge technologies such as artificial intelligence, blockchain, and cloud computing, which enhance their global competitiveness (Ali et al., 2023). Furthermore, exporters are diversifying their market base by expanding into non-traditional markets like Southeast Asia, Africa, and the Middle East, reducing dependency on Western clients (Jamal & Rehman, 2023).

Pakistan's freelancing sector generated \$350.15 million in foreign exchange earnings during the fiscal year 2023-2024 (July-March). Freelancing accounts for a significant portion of the \$3.5 billion IT exports, directly contributing to Pakistan's GDP growth.

Pakistan ranks among the top five countries in freelancing by volume, with the sector's economic activities playing a key role in diversifying the economy beyond traditional industries like agriculture and textiles. Freelancers support micro and small businesses globally, offering cost-effective solutions that enhance their scalability and performance. The freelancing sector has fueled digital entrepreneurship in Pakistan, encouraging the establishment of small IT firms and startups that contribute to job creation and economic activity. As of 2024, Pakistan has approximately 2.37 million freelancers, of which 0.55 million work full-time, having completed at least 10 projects and earned over \$1,000. Freelancers represent a diverse range of professionals, with a significant portion under the age of 30, reflecting the youth-dominated demographic of Pakistan. Women are increasingly joining the freelancing workforce, especially in fields like content writing, graphic design, and digital marketing, where flexible working conditions are beneficial. Initiatives by the government and private organizations to train women in digital skills have further increased their participation.

<sup>19</sup> <https://www.dawn.com/news/1876833>

<sup>20</sup> <https://www.wam.ae/en/article/144snbi-pakistans-services-exports-surge-3384-2864-million> <sup>16</sup> <https://www.arabnews.com/node/2586784/pakistan>

The majority of Pakistani freelancers specialize in software development, graphic design, and digital marketing. Other popular areas include virtual assistance, e-commerce management, and video editing. Online platforms like Upwork, Fiverr, and Freelancer serve as the primary marketplaces for these professionals.

### ***Government Interventions: DigiSkills, STZs, and Tax Incentives etc.***

The Government of Pakistan is exerting efforts to implement multiple strategic initiatives to foster growth in the IT and freelancing sectors. Key initiatives includes DigiSkills program, establishment of Special Technology Zones (STZs), and tax incentives have played pivotal roles in shaping the IT and Freelancing industry.

### ***DigiSkills.pk: Transforming Digital Learning in Pakistan***

DigiSkills.pk, a government-sponsored platform launched by the Ministry of Information Technology and Telecommunication (MoITT), is dedicated to equipping individuals with digital and freelancing skills. As one of the largest digital skills training programs in the region, it has successfully trained over 2.5 million individuals since its inception. The platform offers free online courses across various high-demand domains such as freelancing, digital marketing, graphic design, e-commerce, and more (DigiSkills, 2023).

This initiative has played a crucial role in empowering a new generation of freelancers, particularly those from remote and underserved areas, enabling them to participate in the global digital economy. Additionally, DigiSkills.pk has fostered the rise of digital entrepreneurship in Pakistan. Many trainees have achieved sustainable income streams through popular freelancing platforms like Upwork, Fiverr, and Freelancer. By focusing on accessibility and skill development, DigiSkills has significantly contributed to Pakistan's growing IT exports and freelancing success (Rehman & Shah, 2023).

### ***Special Technology Zones (STZs): Infrastructure for Innovation***

The Government of Pakistan established the Special Technology Zones Authority (STZA) to create Special Technology Zones (STZs) with the aim of fostering innovation and attracting foreign investment in the tech sector. These zones feature state-of-the-art infrastructure, including IT parks and innovation hubs, as well as simplified business registration processes for tech companies. Enhanced connectivity and access to global markets have made these zones attractive to investors and entrepreneurs (STZA, 2023).

The STZs have successfully attracted billions of dollars in foreign direct investment (FDI). For example, the Islamabad Technology Park, inaugurated in 2024, houses over 50 tech companies, offering a conducive business environment for startups and SMEs to scale operations. The STZs have also promoted collaboration between academia and industry, leading to advancements in research and development (R&D). By supporting innovation and entrepreneurship, STZA has become a critical driver of growth in Pakistan's technology sector (Ali & Khan, 2024).

### ***Tax Incentives: Boosting IT and Freelancing Growth***

The Government of Pakistan has implemented a zero-income tax policy on IT exports, effective until June 2025, to stimulate growth in the sector. This policy, coupled with exemptions on import duties for IT-related equipment, has significantly reduced costs for IT exporters and enhanced their competitiveness in the global market (Ministry of IT and Telecommunication [MoITT], 2023).



Freelancers earning up to \$12,000 annually are also exempt from income tax, providing a favorable environment for newcomers entering the market. Simplified processes for opening foreign currency accounts have further eased access to earnings from global freelancing platforms such as Upwork and Fiverr, empowering freelancers to participate in the global digital economy (Rehman & Shah, 2023).

These initiatives have not only increased the competitiveness of Pakistan's IT exports but have also encouraged both local and foreign investors to establish operations in Pakistan. This has bolstered economic activity, created jobs, and positioned Pakistan as a prominent player in the global IT landscape (Ali & Khan, 2023).

***Special Investment Facilitation Council (SIFC) - News Report (Oct, 2024)<sup>21</sup>***

According to the report on IT sector, Pakistan's Information Technology (IT) exports maintained their growth as they fetched \$292 million in September 2024, up 42% from the same month of last year and higher than the last 12-month average of \$280 million. Salient features / statistics of the report are highlighted as follows:

- It is the 12<sup>th</sup> consecutive month of year-on-year (YoY) growth in IT exports, beginning October 2023.
- According to the State Bank of Pakistan (SBP), IT exports for the first quarter (July-September) of the current fiscal year grew 34% from the same period of last year, to stand at \$877 million.
- The growth came in the backdrop of a widening client base of exporters globally, especially in the Gulf Cooperation Council (GCC) region, relaxation in the permissible retention limit from 35% to 50% in the Exporters' Specialized Foreign Currency Accounts and stability of the Pakistani rupee, which was an encouragement for IT exporters to bring back a higher proportion of their profits to Pakistan.
- According to a survey of the Pakistan Software Houses Association (P@SHA), 62% of IT companies are maintaining specialized foreign currency accounts.
- Local IT companies are active in engaging with global clients as recently leading firms attended the London Tech Week 2024, Collision Canada 2024 and Black Hat, USA.
- A major development in financial year 2024-25 was the SBP adding a new category of Equity Investment Abroad, specifically for export-oriented IT companies.
- IT exporters can now acquire interest (shareholding) in entities overseas by utilizing up to 50% proceeds from their specialized foreign currency accounts. This will further boost the confidence of IT exporters and prompt them to remit proceeds to Pakistan.
- Slow internet in Pakistan, is continued to hurt the productivity of IT companies. Yet, IT companies managed to make extra efforts to fetch foreign exchange for the country.
- Monthly IT exports should go up to \$300-350 million in the coming months to achieve real growth on the back of efforts put-in by the government and IT companies in the last few months.
- IT companies are optimistic about expanding their businesses in collaboration with foreign and local firms in traditional and non-traditional markets.
- Net IT exports (exports minus imports) reached \$255 million, an increase of 56% Year over Year (YoY) in September 2024. This number is also higher than the last 12-month average of \$245 million.
- It is estimated that the IT sector will continue its growth trajectory and momentum with likely increase of 10-15% in financial year 2024-25 to a total of \$3.5-3.7 billion.

<sup>21</sup> <https://www.sifc.gov.pk/news/451>

- Pakistan's IT exports increased owing to initiatives for the ease of doing business, adding that steps are underway for giving a further boost to IT exports.

In this regard, IT companies should enhance their penetration and then offer multiple services to their clients, including financial services and enterprise solutions, automation and AI adoption through joint ventures and collaborations. Once IT companies stabilize their foothold, export receipts would augment gradually.

#### *International Projects of NADRA*

In Pakistan, National Database & Registration Authority (NADRA) has been bookmarked as an expert enterprise solution provider, all around the world. Following are the International Projects implemented by NADRA Pakistan<sup>22</sup>:

- i. **Re-admission Case Management System (Republic of Turkiye):** NADRA has developed an Electronic Readmission Case Management System for Turkiye;
- ii. **Somalia National Identification System:** NADRA is collaborating with the Government of Somalia to build a state-of-the-art national data and registration system;
- iii. **Election Management System Fiji:** Fiji Elections Office (FEO) awarded the "Election Management System" to NADRA through International Bid;
- iv. **Electronic Passport System Kenya:** After the successful upgrade of manual to machine readable passports, Kenya Government issued ePassport;
- iv. **National Driver's License System Bangladesh:** NADRA provides regular consultancy services and enhancements to Bangladeshi Licensing systems.
- v. **Re-admission Case Management System (EU):** NADRA developed an Electronic Platform for Readmission of persons residing in (European Union) EU;
- vi. **National Identity System Nigeria:** NADRA has developed and implemented complete backend system;
- vii. **Civil Registration System Sudan:** Civil Registration and Vital Statistics (CRVS) was designed for registration and tracking of vital events of the citizens;
- viii. **Passport Issuance & Control System Kenya:** NADRA enabled Kenya with the issuance of machine-readable passport.

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<sup>22</sup> <https://www.nadra.gov.pk/international-projects>

***Key Stakeholders:***

Major Stakeholders relating to the IT and Freelancing Industry of Pakistan are as follows:

- i. Ministry of IT & Telecom
- ii. PSEB (Pakistan Software Export Board)
- iii. Ministry of Commerce
- iv. FBR (Federal Board of Revenue)
- v. SBP (State Bank of Pakistan)
- vi. Higher Education Commission (HEC)
- vii. Pakistan Telecommunication Authority (PTA)
- viii. Private Sector (Tech Firms, Freelancers, Banks, Training Providers)
- ix. Ministry of Law
- x. International Organizations (Trade bodies, Certification Bodies, Freelance Platforms)

***Leading Software Houses (Companies)***

It has been widely agreed that following are 10 leading software houses (companies) in Pakistan (as of January 2025):

1. Systems Limited, Lahore, Pakistan
2. 10Pearls, Karachi, Pakistan
3. NetSol Technologies, Lahore, Pakistan
4. TRG TECH (Ibex/ Afiniti), Karachi, Pakistan
5. Arbisoft, Lahore, Pakistan
6. Tkxel, Lahore, Pakistan
7. Confiz Limited, Lahore, Pakistan
8. Venture Dive, Karachi, Pakistan
9. Arpatech, Karachi, Pakistan
10. Cubix, Karachi, Pakistan.

These companies have been recognized for their contributions to Pakistan's software industry, offering a range of services from software development to digital transformation solutions.

***Future Prospects***

Pakistan's IT exports and freelancing industry hold immense potential for future growth. The global demand for IT services, particularly in emerging technologies such as artificial intelligence (AI), machine learning, blockchain, and cloud computing, presents an opportunity for Pakistani professionals to establish themselves as global leaders in these fields. Similarly, the freelancing industry is expected to continue its upward trajectory as more companies embrace remote work and digital transformation.

## ***Legal, Institutional Policy and Regulatory Framework Analysis***

Pakistan's IT and freelancing industry are governed by a combination of legal, institutional, and regulatory frameworks designed to foster growth while addressing challenges related to digital entrepreneurship, data security, and taxation. This analysis reviews the key legal and regulatory structures affecting these sectors in Pakistan.

### ***National Information Technology (IT) Policy of 2018***

The National IT Policy (2018) was established to increase Pakistan's global share in IT exports and focus on technology development, research, and innovation. The policy aims for zero income tax on IT exports until 2025, providing a major incentive for the IT export sector.

### ***Cybercrime Law - Prevention of Electronic Crimes Act (PECA) 2016***

PECA governs cybercrimes and aims to combat illegal digital activities such as hacking, fraud, and online harassment. It is a key legal framework regulating cybersecurity and digital crimes. While it designed to protect individuals and businesses, the act has also been criticized for overreach in areas like online speech and data protection, raising concerns about potential censorship and privacy violations.

### ***Intellectual Property Laws***

The Intellectual Property Laws (Copyright Ordinance 1962, Patents Ordinance 2000) provide protection for software, digital content, and IT innovations, helping Pakistan align with international standards for intellectual property rights (IPR). However, enforcement remains weak, and piracy in the software sector continues to be an issue.

### ***Data Protection Laws***

Pakistan currently lacks comprehensive data protection legislation. However, the Data Protection Bill (drafted in 2022) aims to align with global standards such as the General Data Protection Regulation (GDPR), focusing on protecting consumer data and regulating data breaches.

### ***Freelancing Regulation***

The Freelancing Policy focuses on creating an enabling environment for digital workers and establishing better access to foreign clients. Freelancers are primarily governed by self-employment contracts on platforms like Upwork, Fiverr, and Freelancer, rather than a specific regulatory framework. However, freelancers in Pakistan face challenges related to tax documentation and payment systems, where foreign earnings are often subject to stringent banking regulations.

### ***Taxation and Compliance Regulations***

Freelancers in Pakistan are subject to the Income Tax Ordinance 2001. However, those earning below \$12,000 annually are exempt from income tax, which helps ease entry into freelancing. The government has also introduced simplified procedures for freelancers to open foreign currency accounts, easing remittances from clients. Despite these provisions, many freelancers face challenges regarding tax filing and foreign currency repatriation due to regulatory complexities and lack of awareness about tax obligations.

### ***Social Security for Freelancers***

Pakistan has yet to establish a formal social security system for freelancers, leaving them vulnerable to risks such as illness, job instability, and retirement savings. There are calls to create dedicated policies and benefits for the growing freelance workforce to ensure long-term financial security and stability.

### ***Regulatory Framework Challenges***

There are several challenges being faced by IT Industry, key challenges include issues in Infrastructure and Internet Connectivity, Taxation Complexities, Cybersecurity and Data Protection, Regulatory Overreach and Censorship, Payment Issues and Platforms.

### ***Infrastructure and Internet Connectivity***

Pakistan faces issues with reliable internet access, especially in rural areas, which impacts both IT businesses and freelancers. Frequent power outages and slow internet speeds hinder the productivity of digital workers.

### ***Taxation Complexities***

Freelancers often face difficulties navigating Pakistan's complex tax system, which lacks clarity regarding how foreign income should be reported. Although the government has made efforts to simplify the process, there is still a significant knowledge gap among freelancers regarding their tax liabilities and payment procedures.

### ***Cybersecurity and Data Protection***

While the PECA 2016 regulates cybercrimes, Pakistan's data protection laws remain inadequate. This affects businesses and freelancers working in sectors requiring high levels of data security, such as healthcare, finance, and e-commerce. The absence of a comprehensive data protection bill limits consumer trust in digital platforms and transactions.

### ***Regulatory Overreach and Censorship***

The PECA law has been criticized for broad provisions related to online speech and data privacy, particularly in the case of internet shutdowns and the blocking of websites. These actions can disrupt both the IT and freelancing industry, particularly those reliant on global communication and platforms.

### ***Payment Issues and Platforms***

Freelancers in Pakistan face payment challenges due to difficulties in accessing international payment gateways and the fluctuating value of the Pakistani rupee. Issues with PayPal and the lack of efficient cross-border payment solutions continue to limit opportunities for Pakistani freelancers.

### ***Institutional Analysis with respect to Government Initiatives***

The Government of Pakistan is taking several initiatives to promote IT Industry. These initiatives include; DigiSkills Program, Special Technology Zones (STZs), Tax Incentives for IT and Freelancers, National Freelance Facilitation Policy.

#### ***DigiSkills Program***

DigiSkills.pk offers free online courses to train individuals in digital skills, including freelancing, software development, digital marketing, and graphic design. This initiative supports the IT and freelancing sectors by upskilling the workforce and enhancing employability on global platforms.

#### ***Special Technology Zones (STZs)***

The government has established STZs, which are designed to provide favorable business environments, including tax exemptions, infrastructure support, and improved connectivity, to attract IT businesses and startups. The development of these zones is expected to stimulate innovation and enhance the export capabilities of the IT sector.

#### ***Tax Incentives for IT and Freelancers***

Pakistan offers zero-income tax for IT exports and a tax exemption for freelancers earning up to \$12,000 annually to encourage growth in the IT sector. These incentives are aimed at promoting foreign exchange earnings and increasing the participation of Pakistanis in the global digital economy.

#### ***National Freelance Facilitation Policy***

The government is working on a freelance facilitation policy, which aims to create a more supportive legal environment for freelancers, including better access to financial services, skill development programs, and a legal framework for protecting freelance contracts.

### ***Findings - Weaknesses in Current State***

Broadly, some weaknesses have been observed in the system while observing the current state of affairs, key points are enumerated as under:

- i. **Complex Tax System:** The freelancing community and small IT businesses in Pakistan face challenges in understanding the country's complex tax structure. There are no clear guidelines on how to tax freelancers or how the GST (General Sales Tax) applies to them.

- ii. **Limited IP Protection:** Intellectual property rights are not as robust as in other competitive countries, which can deter global clients from trusting freelancers or businesses in Pakistan with sensitive data or proprietary projects.
- iii. **Lack of Legal Protections for Freelancers:** Freelancers do not have the same legal protections as full-time employees, which impacts job security and dispute resolution.

Contrary to the fact and in order to support the IT industry export growth, a desirability of clear and supportive tax framework is deemed to caters the needs of freelancers and the IT industry. In addition, stronger laws and policies and their effective implementation are also need of the time for protection of Intellectual Property (IP) and digital rights to safeguard the work of freelancers and businesses. Moreover, robust legal support systems is proposed to be developed to enable freelancers to resolve disputes with clients effectively on the analogy of Labour and HR Services Laws of employment.

#### ***Institutional and Stakeholders' Analysis of IT and Freelancing Industry of Pakistan***

The Information Technology (IT) and freelancing sectors in Pakistan are vital components of the country's economy, contributing significantly to employment, innovation, and foreign exchange reserves. Institutional analysis helps understand the structures, policies, and organizations shaping this industry. This article explores the institutional framework, key stakeholders, and challenges affecting the IT and freelancing sectors in Pakistan. Several institutions and regulatory bodies play a critical role in the development and regulation of Pakistan's IT and freelancing industry:

- i. **Pakistan Software Export Board (PSEB):** The PSEB is the primary government body promoting Pakistan's IT exports. It provides support in areas such as infrastructure development, capacity building, and international market access. The PSEB collaborates with industry stakeholders to establish IT parks and export zones to enhance competitiveness (PSEB, 2023).
- ii. **Ministry of Information Technology and Telecommunication (MoITT):** The MoITT is responsible for formulating policies to foster growth in the IT sector. Initiatives such as the Digital Pakistan Vision aim to improve connectivity, promote digital literacy, and encourage technology-driven entrepreneurship (MoITT, 2023).
- iii. **Higher Education Commission (HEC):** The HEC plays a crucial role in developing a skilled IT workforce by introducing specialized degree programs, funding research, and facilitating collaboration between academia and industry. Its initiatives include the establishment of technology incubators and funding for tech startups (HEC, 2022).
- iv. **State Bank of Pakistan (SBP):** The SBP facilitates foreign remittance channels for freelancers and IT exporters. Recent policies, such as reduced transaction costs and streamlined banking processes, have improved the ease of conducting international transactions (SBP, 2022).

- v. **Freelancing Platforms and Private Sector:** Freelancing platforms like Fiverr, Upwork, and Freelancer.com act as intermediaries, connecting Pakistani freelancers to global markets. Private sector IT firms and training institutes also contribute to workforce development and global outreach.

Despite significant progress, the IT and freelancing industry in Pakistan is facing several institutional and structural challenges including:

- i. **Policy Implementation Gaps:** While policies such as tax incentives exist, inconsistent implementation and bureaucratic hurdles often impede growth. For instance, delays in IT park construction and lack of regulatory clarity discourage investment (Ahmed & Khan, 2022).
- ii. **Skills Mismatch:** A disparity exists between the skills provided by educational institutions and those demanded by global markets. This gap limits the employability of IT graduates and freelancers (Ali, 2023).
- iii. **Digital Infrastructure:** Limited access to reliable internet and electricity in rural areas restricts the growth of freelancing opportunities. Enhanced infrastructure investment is essential to bridge this gap.
- iv. **Global Competition and Branding:** Pakistani IT firms and freelancers face stiff competition from countries like India, the Philippines, and Bangladesh. Additionally, insufficient branding and marketing hinder the global visibility of Pakistani talent (Shah, 2023).

Likewise, challenges, there exists a vast growth potential and a room for opportunities which includes:

- i. **Government Incentives:** Expanding tax holidays, reducing regulatory barriers, and offering low-cost loans to IT firms and freelancers could accelerate growth in the sector.
- ii. **Skill Development:** Public-private partnerships to enhance technical skills and soft skills training for freelancers would improve their global competitiveness.
- iii. **Global Outreach:** Promoting Pakistani IT services and freelancing talent through international trade fairs, partnerships, and certifications could boost visibility and trust.
- iv. **Women's Inclusion:** Encouraging female participation in freelancing and IT through mentorship programs, funding opportunities, and safe working environments can unlock untapped potential.



## 8. Comparative Analysis with Global Entities

Pakistan's IT and freelancing industry has shown substantial growth in recent years. However, when compared to global leaders like

India, Malaysia Bangladesh, Philippines and Vietnam, there are both strengths and challenges that define Pakistan's position in the global landscape. A table depicts comparative analysis of IT exports, workforce, infrastructure, and freelancing across the selected countries is detailed below:

Country	IT Exports (2023)	Contribution to GDP	Annual IT Graduates	Freelancing Rank	Freelancing Earnings (2023)	Top Skills	Infrastructure	Ease of Doing Business Rank (2023)
India	\$245 billion	~8%	1.5 million	1st	\$3.5 billion	Software engineering, AI, data science	IT parks, SEZs, global data centers	63rd
Malaysia	\$16 billion	~7%	~50,000	18th	\$500 million	E-commerce, digital marketing	High-speed internet, e-commerce platforms	12th
Bangladesh	\$1.6 billion	~1%	~40,000	8th	\$400 million	Graphic design, data entry, virtual assistance	Hi-Tech parks, startup incubation	168th
Philippines	\$29 billion	~7.5%	~75,000	6th	\$1 billion	Customer service, BPO, content	BPO centers, SEZs	95th

						writing		
<b>Vietnam</b>	\$14 billion	~5%	~60,000	10th	\$600 million	Blockchain, hardware engineering	Innovation hubs, SEZs	70th
<b>Pakistan</b>	\$3.23 billion	~1.5%	~25,000	4th	\$1.5 billion	Freelancing, digital marketing, graphic design	Developing IT parks, coworking spaces	108th

A comparative analysis to highlight weaknesses and areas of improvement for Pakistan's IT and freelancing sectors in tabulated format is as follows:

Weaknesses of Pakistan's IT & Freelancing Industry	Strengths of Global IT Industries
<b>1. Limited Infrastructure and Technological Hubs:</b> Pakistan lacks adequate IT parks, tech hubs, and innovation centers, hindering the scalability and growth of IT firms and freelancers.	<b>India:</b> Well-established IT hubs like Bengaluru, Hyderabad, and Chennai foster collaboration, R&D, and the growth of tech startups.
<b>2. Slow Digital Transformation:</b> Pakistan is still catching up with adopting emerging technologies like AI, Blockchain, and IoT.	<b>Malaysia:</b> The government focuses strongly on digital transformation, including AI, IoT, and cloud computing.
<b>3. Limited Government Policies for Freelancers:</b> Pakistan lacks comprehensive frameworks and strong incentives for freelancers, limiting growth potential.	<b>Bangladesh:</b> The government supports freelancers with initiatives like training programs and access to digital platforms.
<b>4. Limited Availability of Funding for IT Startups:</b> Access to venture capital and angel investors for IT startups in Pakistan remains insufficient.	<b>Philippines:</b> Strong government-backed incubators and accelerators provide ample funding and resources for IT startups.
<b>5. Skills Gap in Emerging Technologies:</b> Pakistan's workforce lacks expertise in high-demand fields like AI, cybersecurity, and blockchain.	<b>Vietnam:</b> A growing pool of talent with expertise in AI, machine learning, and cloud computing.
<b>6. Limited Access to Global Platforms for Freelancers:</b> Freelancers face challenges	<b>India:</b> Access to global platforms like Upwork, Freelancer, and

with international payment systems and platforms.	Fiverr, with smoother payment systems, enhances freelancers' global reach.
<b>7. Lack of Robust Quality Standards for IT Services:</b> Pakistan lacks strong international quality certifications compared to leading IT outsourcing destinations.	<b>Malaysia:</b> Recognized for international quality standards and certifications, enhancing global trust in its IT industry.

<b>Weaknesses of Pakistan's IT &amp; Freelancing Industry</b>	<b>Strengths of Global IT Industries</b>
<b>8. Inadequate Support Systems for Freelancers:</b> Pakistan lacks a structured support system to help freelancers connect with clients or protect their legal interests.	<b>Philippines:</b> A strong freelance ecosystem with better community support and a favorable regulatory environment.
<b>9. Insufficient Technological Research and Development (R&amp;D):</b> Investment in R&D is low, affecting innovation and the development of cutting-edge technology.	<b>India:</b> Leads in innovation and R&D, producing world-class IT solutions and driving technological advancement.
<b>10. Poor Internet Connectivity in Rural Areas:</b> Rural areas face challenges with slow internet speeds, limiting digital inclusion.	<b>Vietnam:</b> Strong national broadband infrastructure ensures widespread internet connectivity, even in rural areas.

#### ***Mitigation Strategies for Pakistan's IT & Freelancing Industry Weaknesses***

Government support should prioritize the creation of IT parks, incubators, and tech hubs, especially in rural regions. Public-private partnerships can help boost infrastructure. Pakistan's educational institutions should invest in advanced curriculum and training programs for AI, blockchain, and cybersecurity. Collaboration with global tech companies for knowledge transfer would be essential. The government could introduce freelancer-friendly policies, such as tax incentives, access to international payment systems, and creation of dedicated freelance forums. Establish more venture capital funds and angel investors targeting IT and technology startups to foster innovation and entrepreneurship. Pakistan needs more comprehensive initiatives, like DigiSkills.pk, to offer training in emerging technologies and bridge the skills gap. Pakistan should work with financial institutions to ensure better access to global payment systems for freelancers and IT companies.

Introduction of international certifications and industry standards (like ISO, CMMI) for IT services to raise Pakistan's profile in global markets. Create structured platforms and legal support systems that allow freelancers to operate more efficiently and safeguard their rights. Increase government and private sector funding for technological R&D to spur innovation and improve Pakistan's technological output. Investing in broadband infrastructure in rural areas to bridge the digital divide, enabling more freelancers to access global markets will also trigger an economic boom to accelerate export of IT Industry.

## *SWOT Analysis*

### **Strengths**

- i. **Young, Skilled Workforce:** Pakistan has a large, young population with over 60% under the age of 30, providing a dynamic and adaptable workforce. Many young professionals are trained in IT and digital skills, contributing to a growing number of tech entrepreneurs and freelancers.
- ii. **Low Labor Costs:** One of Pakistan's key competitive advantages is its relatively low labor cost compared to global players, especially India and the Philippines, making it an attractive destination for outsourcing and freelancing.
- iii. **Government Support:** The government's initiatives, such as DigiSkills, Special Technology Zones (STZs), and tax exemptions for IT exports, support the growth of both the IT and freelancing sectors.
- iv. **Growing Freelance Market:** Pakistan ranks among the top five freelancing countries globally. With a large pool of skilled freelancers, it generates substantial foreign exchange and serves clients from across the globe.

### *Weaknesses*

- i. **Infrastructure Challenges:** Poor internet connectivity, power outages, and lack of reliable infrastructure in some regions hinder the growth of the IT and freelancing sectors, especially in rural areas where digital access is limited.
- ii. **Regulatory and Taxation Issues:** Complex tax regulations and lack of a clear framework for freelancers make it difficult for individuals to comply with tax laws. Also, the regulatory environment for IT startups and freelancers can be restrictive due to bureaucratic hurdles.

- iii. **Limited Access to Global Payment Systems:** Pakistan still faces challenges related to access to international payment gateways like PayPal. While platforms like Payoneer exist, they still don't offer the same ease of use or flexibility, limiting opportunities for freelancers.
- iv. **Intellectual Property Protection:** While Pakistan has intellectual property laws, enforcement remains weak. This can discourage investment in tech innovation and lead to concerns over software piracy, especially for IT firms.

#### *Opportunities*

- i. **Increasing Global Demand for IT Services:** With global digital transformation, there is rising demand for software development, cybersecurity, AI, and other tech services. Pakistan can capitalize on this growing demand, particularly in the U.S. and European markets, where there is a shortage of tech talent.
- ii. **Government Policies and Incentives:** Continued government initiatives, such as the National Freelance Facilitation Policy, tax incentives, and STZs, provide an excellent foundation for growth. These policies can boost international trade, especially in IT exports and freelancing.
- iii. **Growth of Remote Work:** The global shift towards remote work post-COVID19 creates ample opportunities for Pakistani freelancers and IT professionals to tap into a broader range of international clients.
- iv. **Digital Skills Development Programs:** Initiatives like DigiSkills and Google's Digital Skills Program are positioning Pakistan's workforce to become more competitive in global digital markets, providing opportunities for youth and women to access the freelancing market.

#### *Threats*

- i. **Competition from Other Low-Cost Countries:** Pakistan faces stiff competition from other low-cost freelancing hubs like India, the Philippines, and Bangladesh. While Pakistan is a leading player in global freelancing, these countries have larger, more established markets with better infrastructure.
- ii. **Cybersecurity Concerns:** The lack of robust cybersecurity measures makes both the IT sector and freelancing industry vulnerable to cyber-attacks, data theft, and fraud, which could harm the reputation of freelancers and IT companies in Pakistan.

- iii. **Regulatory Overreach and Censorship:** Legal frameworks like PECA 2016 could result in excessive censorship or regulation of online activities, leading to restrictions on freelancing platforms or IT services. Moreover, Pakistan's general political instability can create uncertainty for businesses.
- iv. **Brain Drain:** Many highly skilled tech professionals and freelancers are leaving Pakistan for better opportunities in Western countries, leading to a potential shortage of talent and investment within the local tech ecosystem.

### *EETH Analysis*

The EETH (Enhance Strength, Eliminate Weakness, Take Advantage of Opportunities, and Hedge Against Threats) Analysis provides a strategic approach to improving the performance of Pakistan's IT and freelancing industry by enhancing strengths, addressing weaknesses, seizing opportunities, and protecting against threats. Below is a breakdown of how Pakistan can leverage this framework to boost the growth of its IT and freelancing sectors inferred from the research:

#### **1. Enhance Strengths**

##### *i. Action Plan for Young, Skilled Workforce*

- **Focus on continuous skill development:** As Pakistan's workforce is young and tech-savvy, it is crucial to invest in continuous education and skill development programs that provide certifications in emerging fields such as Artificial Intelligence (AI), blockchain, data science, and cybersecurity. These programs can be aligned with global industry standards to improve the employability of IT professionals and freelancers.

**Collaborations with global tech giants:** Develop partnerships with international companies for internships, training programs, and apprenticeships to provide practical exposure and ensure that the workforce remains competitive.

##### *ii. Action Plan for Low Labor Costs*

- **Leverage cost advantages in outsourcing:** Pakistan can further strengthen its position as a competitive outsourcing hub by promoting its labor cost advantage, especially in areas like software development, mobile app development, and digital marketing.

- **Incentivize startups:** Provide special incentives to startups that hire a large number of tech professionals or freelancers, helping create job opportunities while keeping operational costs low.

*iii. Action Plan for Government Support (DigiSkills, STZs, Tax Exemptions)*

- **Expand government initiatives:** Increase funding for government-backed programs like DigiSkills and STZs. In particular, provide tax breaks and other incentives to IT businesses and freelancers who register in these zones, to encourage more international business partnerships.
- **Promote local and international partnerships:** Encourage public-private collaborations to scale these government initiatives, ensuring their sustainability and growth.

**2. Eliminate Weaknesses**

*i. Action Plan for Infrastructure Challenges (Internet Connectivity, Power Supply)*

- **Upgrade infrastructure:** The government and private sector should invest in improving broadband internet connectivity across the country, especially in rural and underdeveloped areas. Enhanced internet access will enable IT businesses and freelancers to work seamlessly and effectively.  
**Increase investment in renewable energy:** To address power outages, invest in solar energy projects and other renewable resources to ensure a stable power supply for digital workers and IT companies.

*ii. Action Plan for Taxation and Regulatory Challenges*

- **Simplify tax procedures:** Introduce a simplified taxation framework specifically for freelancers and small IT businesses, possibly through the creation of a dedicated freelancing tax policy. The government should also offer better clarity about tax liabilities for freelancers earning international income.
- **Streamline regulatory frameworks:** Revise and modernize regulations to foster innovation while balancing the need for consumer protection. For instance, simplify registration processes for freelancers and provide a dedicated regulatory body that handles freelancing-related complaints and issues.

*iii. Action Plan for Limited Access to Global Payment Systems*

- **Facilitate international payments:** Work with financial institutions and international payment providers to introduce systems like PayPal, Stripe, or TransferWise that facilitate smoother cross-border transactions for Pakistani freelancers and IT businesses.
- **Develop domestic solutions:** In the absence of major global payment systems, encourage the development of local payment solutions tailored to the needs of freelancers, including lower transaction fees and real-time processing.

*iv. Action Plan for Weak Intellectual Property Protection*

- **Strengthen Intellectual Property Rights (IPR) laws:** The government should increase efforts to enforce intellectual property rights. This can include stricter penalties for violations, increased public awareness campaigns about the importance of IP, and better mechanisms for dispute resolution in the tech sector.  
**Global IP collaborations:** Collaborate with international organizations like WIPO (World Intellectual Property Organization) to create a framework that protects digital products, software, and designs.

**3. Take Advantage of Opportunities**

*i. Action Plan for Increasing Global Demand for IT Services*

- **Target global markets:** Position Pakistan as a high-quality, cost-effective outsourcing destination, targeting countries with growing demand for IT services, especially in sectors like fintech, e-commerce, and cloud computing.
- **Develop niche expertise:** Pakistan should develop expertise in emerging areas such as artificial intelligence, blockchain, 5G, and cybersecurity, allowing the country to position itself as a leader in these high-demand technologies.

*ii. Action Plan for Growth of Remote Work*

- **Enhance freelancing platforms:** Create more opportunities for Pakistani freelancers by building local freelancing platforms tailored to specific industries like software development, content creation, and digital marketing. Encourage collaboration with global freelancing platforms to expand market reach.



- **Establish remote work hubs:** Pakistan can develop remote work hubs in urban centers where freelancers can find better infrastructure and networking opportunities. These hubs can attract international clients and offer a collaborative environment for freelancers.

*iii. Action Plan for Government Policies and Incentives*

- **Enhance digital skills training:** Programs like DigiSkills have been effective in empowering the youth. The government should continue to scale these initiatives, particularly for marginalized groups, to ensure inclusivity and economic participation.  
**Offer new incentives for innovation:** Pakistan can offer additional tax relief and financial support to innovative tech startups that introduce new products or services into the global market.

*iv. Action Plan for Digital Skills Development Programs*

- **Promote global certifications:** Partner with global organizations to provide certification programs in fields like cloud computing, data science, and digital marketing, ensuring Pakistani workers are globally competitive.
- **Increase public-private partnerships:** Strengthen collaborations between the private tech sector, universities, and government agencies to bridge the skills gap and ensure that education programs are aligned with industry needs.

#### **4. Hedge Against Threats**

*i. Action Plan for Competition from Other Low-Cost Countries*

- **Focus on quality and niche markets:** Pakistan should focus not only on low costs but also on offering high-quality services and specialized skills that can differentiate the country from competitors. For example, Pakistan can specialize in high-demand tech areas like cloud computing or AI development.
- **Promote Pakistan's tech ecosystem:** Through national campaigns and digital marketing, Pakistan can showcase success stories from its tech and freelancing industry, enhancing its image as a reliable, innovative partner for outsourcing and freelancing.

*ii. Action Plan for Cybersecurity Concerns*

- **Improve cybersecurity measures:** Strengthen national cybersecurity infrastructure by establishing dedicated agencies to address cyber threats and ensure that both IT firms and freelancers comply with data security standards.
- **Educate workers and clients:** Conduct training programs for freelancers and IT firms on best practices in cyber hygiene, data encryption, and online fraud prevention to minimize risks and enhance trust in the Pakistani digital workforce.
- **iii. Action Plan for Regulatory Overreach and Censorship**
- **Advocate for balanced regulation:** Work with policymakers to ensure that laws like PECA 2016 do not stifle freedom of expression or limit access to global platforms. Encourage a collaborative dialogue between the government, digital businesses, and civil society to ensure regulations protect citizens while fostering innovation.
- **Develop a supportive legal environment:** Advocate for a legal framework that supports digital entrepreneurship, including freelancer rights, contract enforcement, and dispute resolution.

*iv. Action Plan for Brain Drain*

- **Encourage tech entrepreneurship:** Create policies that incentivize tech professionals to stay in Pakistan, such as funding opportunities for startups, incubators, and co-working spaces that provide support for young tech entrepreneurs.
- **Offer competitive salaries and benefits:** Develop initiatives aimed at increasing salaries and creating a more attractive working environment for IT professionals to prevent the outflow of talent.

***Blavatnik School of Government's Oxford Index of Public Administration (OIPA) framework Analysis***

The Blavatnik School of Government, part of the University of Oxford, offers a comprehensive approach to public policy analysis. While they may not have a specific index focused on the IT and freelancing industry in Pakistan, their broader framework for public policy analysis can be applied to assess the IT and freelancing industry in Pakistan with respect to government regulation, economic development, education, infrastructure, and international competitiveness. Therefore, outcomes of the Oxford Index of Public Administration (OIPA) framework analysis of Pakistan's IT and freelancing sectors is described as follows:

### *Policy Design and Effectiveness*

The policies surrounding the IT and freelancing industry in Pakistan are often fragmented and lack comprehensive long-term strategies. Various initiatives like **DigiSkills** and **Special Technology Zones (STZs)** have been launched to support IT growth and freelancing, but there is no cohesive, national-level framework to integrate these efforts effectively.

#### **Policy Gaps:**

- **Taxation Framework:** There is no clear, simplified tax structure for freelancers. While freelancers contribute to the economy, the taxation policies remain convoluted, which may discourage new freelancers from entering the sector.
- **Support for Innovation:** The policies focusing on innovation within the IT and freelancing sectors are still underdeveloped. There is a need for a more **targeted approach** to support R&D, technology adoption, and entrepreneurship.

#### **Effectiveness Analysis:**

- **DigiSkills** aims to provide training to millions of Pakistanis to improve their digital skills, but the effectiveness of the program is constrained by the lack of strong monitoring systems and integration with global platforms.
- **STZs** offer infrastructure and tax incentives for IT businesses, but these zones are not yet fully realized and have not been able to create an attractive environment for all sectors of the industry, especially in rural areas.

### *Regulatory and Legal Framework*

#### **Challenges includes:**

- **Limited Legal Framework:** Pakistan's current **regulatory environment** lacks the necessary frameworks for global freelancing platforms to operate smoothly.

For example, **PayPal** is unavailable in Pakistan, which affects freelancers' ability to receive international payments easily.

- **Intellectual Property Rights:** The IT sector also faces challenges in **IP protection**, with existing laws being inadequate to prevent the exploitation of software and digital content.
- **Cybersecurity:** As the IT and freelancing sectors grow, there are increasing concerns about **data privacy and cybersecurity**.

- Pakistan's cybersecurity laws and regulations have not kept pace with the rapid growth in digital services.

#### **Policy Recommendations:**

- **Policy Integration:** A stronger, integrated **regulatory framework** that includes global digital trade, **data protection**, and **intellectual property** could support the growth of Pakistan's IT and freelancing industry.
- **Incentive Programs:** Further **government support** for the protection of freelancers' intellectual property and easier tax compliance systems could significantly improve the overall working environment.

#### *Infrastructure and Investment*

##### **Challenges includes:**

- **Lack of Technological Infrastructure:** While larger cities have access to better technology infrastructure, rural areas continue to experience poor internet connectivity and power shortages, which limits the productivity of IT businesses and freelancers outside major cities.
- **Limited Investment in Startups:** The Pakistani government has not created sufficient policies to attract **venture capital** or **angel investors**. This stifles the ability of startups in IT and freelancing to scale up quickly.

##### **Investment Recommendations:**

- **Infrastructure Expansion:** Increased government investment in **broadband connectivity**, especially in rural areas, would ensure that freelancers across Pakistan have equal access to global clients.
- **VC and Innovation Funds:** By establishing dedicated **innovation and technology funds**, Pakistan could foster the growth of high-potential tech startups and enhance the global competitiveness of its IT sector.

#### *Education and Skills Development*

##### **Challenges includes:**

- **Skills Mismatch:** Despite increasing access to online learning platforms, there remains a **mismatch** between the **skills taught** in Pakistan's universities and the **demands of the global IT and freelancing markets**. Areas such as **data science**, **cloud computing**, and **blockchain** are not adequately covered in most curricula.

- **Digital Literacy:** Although the government has launched several digital literacy programs, such as **DigiSkills**, they often fail to reach the full potential of **youth and women**, who remain underrepresented in the workforce.

#### Policy Recommendations:

- **Curriculum Reform:** Collaboration with international tech giants and local startups can lead to **curriculum reforms** that reflect the evolving demands of the IT industry.
- **Youth and Gender-Focused Programs:** Specific initiatives that **target women and rural youth** for training in digital skills and freelancing can help create a more diverse and robust talent pool.

#### *Global Competitiveness and International Trade*

#### Challenges includes:

- **Global Perception:** While Pakistan has emerged as a leading country in **freelancing**, it still faces a **global perception issue** due to concerns about payment systems, regulatory issues, and the **lack of professional standards** in the freelancing ecosystem.
- **Outsourcing and BPO:** Pakistan has been losing its competitive edge in **BPO services** to countries like **India, Philippines, and Bangladesh**, which have better-established outsourcing ecosystems.

#### Policy Recommendations:

- **Global Market Integration:** Pakistan could significantly improve its position in the global IT and freelancing markets by facilitating partnerships with global platforms, offering better **tax incentives**, and enhancing **digital trade agreements**.
- **Marketing Pakistan as a Digital Hub:** A **national campaign** to promote Pakistan's IT and freelancing talent can help improve global perceptions, attracting foreign clients and investors.

#### *Social and Cultural Context*

#### Challenges includes:

- **Gender Inequality:** Women, especially in rural areas, face significant barriers to entering the IT and freelancing sectors. These include limited access to education, cultural restrictions, and lack of mentorship.

- **Cultural Attitudes toward Freelancing:** Freelancing is often seen as an unstable career path, which prevents many potential freelancers from entering the market.

**Policy Recommendations:**

- **Targeted Social Programs:** Programs that empower **young women** and **minority groups** to pursue freelancing careers can unlock a significant talent pool. Offering mentorship and skill development programs specifically for these groups can bridge the gender gap.
- **Public Awareness Campaigns:** Promoting the **stability and success** of freelancing careers can help shift societal views on freelancing and attract more young professionals into the industry.

***Summary of Blavatnik School's Public Policy Framework Analysis***

By adopting the Blavatnik School of Government's approach to public policy analysis, we can identify the structural challenges and barriers that impede the growth of Pakistan's IT and freelancing industry. To foster sustainable growth, Pakistan will need to:

- Strengthen the regulatory framework.
- Improve skills development and infrastructure.
- Attract investment and venture capital.
- Promote global integration and diversity in the workforce.
- 

Addressing these challenges will enable Pakistan to leverage its young, tech-savvy population, positioning itself as a global leader in the digital economy.

## ***GAP analysis of Pakistan's IT exports and freelancing Sector with Philippines and Vietnam with respect to OIPA***

A GAP analysis of Pakistan's IT and Freelancers Sector with respect to the Philippines and Vietnam has been carried to assess the areas of improvements for Pakistan in the context of OIPA and observed as follows:

### ***IT Export Performance***

In FY2024, Pakistan's IT exports reached \$3.2 billion, marking a 24% year-on-year growth. In addition, the SBP reports that Computer Services contributed approximately 80.5% of these exports. Whereas, Vietnam's IT exports have seen significant growth, with exports to the Philippines alone amounting to \$5.11 billion in 2022 and the Philippines has a well-established IT-BPO industry, contributing substantially to its economy.

**Gap Identified:** Pakistan's IT export volume remains lower than that of Vietnam and the Philippines, indicating potential for growth.

### ***Freelancing Ecosystem***

Pakistan has a burgeoning freelancing community, with estimates of over 1 million freelancers contributing to the digital economy. Challenges include limited access to global payment gateways and the need for advanced skill development programs. On the other hand, both the Philippines and Vietnam have more streamlined processes, including access to global payment systems like PayPal, and government-supported training programs, enhancing their freelancers' competitiveness.

**Gap Identified:** Pakistan needs to improve payment infrastructure and provide targeted training to enhance freelancers' global competitiveness.

### ***Infrastructure and Technology Access***

Pakistan's Urban centers have relatively good internet connectivity, but rural areas face challenges in accessing high-speed broadband. The Pakistan Telecommunication Authority (PTA) is working towards expanding internet penetration, but disparities remain.

Both Vietnam and the Philippines have made significant investments in ICT infrastructure, resulting in higher internet penetration rates and more uniform access across regions.

**Gap Identified:** Pakistan must invest in expanding and upgrading its ICT infrastructure to ensure equitable access nationwide.

### ***Legal and Regulatory Framework***

In Pakistan, the Federal Board of Revenue (FBR) has introduced tax incentives for the IT sector, but complexities in tax administration and a lack of robust intellectual property protections pose challenges. Whereas, the Vietnam and the Philippines have more developed legal frameworks supporting the IT industry, including clearer tax policies and stronger intellectual property laws.

**Gap Identified:** Pakistan needs to simplify tax policies and strengthen legal protections to foster IT sector growth.

### *Public Administration and Governance*

Efforts are being made by Pakistan to improve governance in the IT sector, but bureaucratic hurdles and policy implementation issues persist. Whereas, Vietnam and the Philippines have more efficient public administration systems supporting IT industry growth, including proactive government policies and public-private partnerships.

**Gap Identified:** Pakistan should streamline administrative processes and enhance governance to support the IT sector effectively.

Based on the analysis following policy actions are proposed taken by these countries can address the challenges currently faced by Pakistan in its IT exports and freelancing sectors to abridge the GAP:

Policy Actions	How It Addresses Pakistan's Challenges
1. Comprehensive Tax Incentives:	<b>Philippines:</b> Tax holidays and export promotion through PEZA. <b>Vietnam:</b> Tax incentives and SEZs like Quang Trung Software City. <b>For Pakistan:</b> Streamline tax benefits for IT exporters and freelancers. Establish more IT-specific SEZs for focused growth.
2. Workforce Development:	<b>Philippines:</b> Language proficiency and IT training integrated into education. <b>Vietnam:</b> Advanced training in AI, blockchain, IoT, and emerging tech. <b>For Pakistan:</b> Implement advanced skill development programs aligned with global demand in emerging technologies.
3. Infrastructure Development:	<b>Philippines:</b> IT parks with robust digital infrastructure. <b>Vietnam:</b> Well-developed tech zones supporting startups.
Policy Actions	How It Addresses Pakistan's Challenges
	<b>For Pakistan:</b> Expand IT parks nationwide and upgrade digital infrastructure, particularly in underserved regions.
4. Government Support for Startups:	<b>Philippines:</b> Startup Philippines initiative with grants and support. <b>Vietnam:</b> Vibrant ecosystem backed by foreign investment. <b>For Pakistan:</b> Provide venture capital funding and ease bureaucratic hurdles for tech startups.
5. Diversification of Export Markets:	<b>Philippines:</b> Serves North America, Europe, and Asia-Pacific. <b>Vietnam:</b> Targets EU, Japan, and neighboring regions. <b>For Pakistan:</b> Develop strategic partnerships in Europe, AsiaPacific, and high-value markets to reduce reliance on U.S. and Gulf countries.



6. Promotion of Emerging Technologies:	<b>Philippines:</b> Integration of AI and RPA into BPO services. <b>Vietnam:</b> Focus on AI, blockchain, and IoT with notable success stories. <b>For Pakistan:</b> Invest in R&D for AI, blockchain, IoT, and fintech to diversify IT service offerings.
7. Freelancer Ecosystem Enhancement:	<b>Philippines:</b> Financial inclusion for freelancers and integration into global platforms. <b>Vietnam:</b> Strong global presence on Upwork and Fiverr. <b>For Pakistan:</b> Ensure financial inclusion for freelancers and promote participation in global freelancing platforms.
8. Digital Branding and Marketing:	<b>Philippines:</b> Highlights global successes to attract investment. <b>Vietnam:</b> Uses case studies like Axie Infinity to demonstrate tech expertise. <b>For Pakistan:</b> Showcase IT export success stories and brand Pakistan as a quality-driven outsourcing destination.

### *GAP Analysis*

A GAP Analysis of the IT and freelancing industry in Pakistan focuses on identifying the difference between the current state of the industry and the desired state. It highlights the areas where improvements are needed to align the industry with its full potential and meet both national and global demands. Using the 80/20 Principle, the following analysis breaks down the major gaps (fault lines) in various areas affecting the growth and competitiveness of IT and Freelancing industry derived in light of inference of the various analytical tools carried in the earlier segments of this document:

#### *Skills Gap and Workforce Development*

##### **Current State:**

- **Skills Mismatch:** There is a significant gap between the skills available in the workforce and the skills required by global markets. Although Pakistan produces a large number of graduates, many lack proficiency in cutting-edge fields like data science, AI, cloud computing, and blockchain.
- **Limited Training Programs:** While initiatives like DigiSkills exist, they are often not comprehensive enough to prepare freelancers for specialized international markets.

**Desired State:**

- **Alignment with Global Needs:** Pakistan needs a workforce that is proficient in high-demand IT skills and capable of competing in global markets. This includes both technical skills and soft skills like communication, project management, and client relationship management and therefore, strong desire of curriculum re-alignment with 21<sup>st</sup> Century standards.
- **Widespread Access to Training:** More inclusive, well-funded, and expansive training programs that address the current industry gaps (like AI, cybersecurity, and software engineering) need to be implemented across urban and rural areas.

**GAP:** The lack of advanced and specialized training programs and an unaligned educational system with international job market demands is hindering growth in IT and freelancing.

*Infrastructure and Technology Access*

**Current State:**

- **Unequal Access to High-Speed Internet:** Internet speeds and accessibility are better in major cities, but rural areas still face limitations in terms of broadband connectivity. Electricity shortages also contribute to operational inefficiencies.
- **Limited Digital Tools and Platforms:** While there are some tools available for freelancers, many lack access to international payment gateways like PayPal and global job platforms that can help them reach a broader market.

**Desired State:**

- **Reliable and Accessible Infrastructure:** Pakistan should have nationwide high-speed internet coverage, even in rural areas, along with stable electricity supply.
- **Integration with Global Platforms:** Access to global payment systems (such as PayPal) and digital platforms that enable seamless interaction with international clients.

**GAP:** Infrastructure deficiencies in broadband internet and digital payment systems significantly limit the potential of freelancers and small IT businesses.

### *Legal, Institutional and Regulatory Framework*

#### **Current State:**

- **Complex Tax System:** The freelancing community and small IT businesses in Pakistan face challenges in understanding the country's complex tax structure. There are no clear guidelines on how to tax freelancers or how the GST (General Sales Tax) applies to them.
- **Limited IP Protection:** Intellectual property rights are not as robust as in other competitive countries, which can deter global clients from trusting freelancers or businesses in Pakistan with sensitive data or proprietary projects.
- **Lack of Legal Protections for Freelancers:** Freelancers do not have the same legal protections as full-time employees, which impacts job security and dispute resolution.

#### **Desired State:**

- **Clear and Supportive Tax Framework:** A tax system that is simplified and specifically caters to freelancers and the IT industry.
- **Robust Intellectual Property Laws:** Stronger laws and policies around IP protection and digital rights to ensure freelancers and businesses can safeguard their work.
- **Freelancer Legal Protection:** Legal support systems that enable freelancers to resolve disputes with clients, along with job security provisions similar to other forms of employment.

**GAP:** The absence of a freelancer-friendly tax system and inadequate legal frameworks for IP protection and dispute resolution are barriers to scaling the IT and freelancing industry.

### *Global Market Access and Recognition*

#### **Current State:**

- **Low Visibility on Global Platforms:** While Pakistan has a large number of freelancers, the country still struggles with low recognition on global freelancing platforms like Upwork and Fiverr.
- **Competition with Other Countries:** Freelancers from countries like India and the Philippines often have a higher presence on global platforms due to better established ecosystems and recognition.

#### **Desired State:**

- **Global Recognition of Pakistani Talent:** Pakistan should enhance its presence on global freelancing platforms and position itself as a leading destination for tech talent.

- **Branding and Outreach Programs:** A strong global branding campaign that promotes the IT and freelancing sectors in Pakistan could attract clients from around the world.

**GAP:** Limited international visibility and lack of national branding efforts prevent Pakistani freelancers and IT businesses from competing effectively on the global stage.

#### *Financial and Investment Support*

##### **Current State:**

- **Limited Access to Funding:** IT startups and freelancers often face difficulties in accessing funding or investment. The lack of venture capital (VC) and angel investors means that scaling up an IT business or freelancing platform is difficult.
- **High Transaction Fees:** Available payment systems, such as Payoneer, have high transaction fees, making it less cost-effective for freelancers to operate.

##### **Desired State:**

- **Easier Access to Investment:** A more robust VC ecosystem and governmentbacked financing schemes for tech startups and freelancers.
- **Lower Transaction Costs:** The ability to use global payment systems like PayPal at lower transaction costs to ensure higher profit margins for freelancers.

**GAP:** The lack of financial support mechanisms and high transaction fees limit the ability of freelancers and small IT businesses to scale effectively.

#### *Cultural and Social Barriers*

##### **Current State:**

- **Gender Inequality:** Women in Pakistan face cultural and societal barriers that limit their participation in freelancing and IT. This includes challenges related to access to education, mentorship, and online networking opportunities.
- **Perceptions of Freelancing:** Freelancing is often seen as an unstable and unreliable career path in Pakistan, especially among traditional job-seekers and parents.

##### **Desired State:**

- **Inclusive Workforce:** Initiatives to empower women and minority groups by improving access to digital skills training, mentorship, and online work opportunities.
- **Social Acceptance of Freelancing:** Programs to change the perception of freelancing, highlighting its success stories and economic potential to encourage more individuals to pursue it as a viable career.

**GAP:** Cultural barriers around gender equality and misconceptions about freelancing continue to limit workforce participation in the sector, especially among women and marginalized communities.

*Summary of Gaps in Pakistan's IT and Freelancing Sector*

The GAP Analysis of Pakistan's IT and freelancing industry reveals several areas that require attention to unlock their potential:

- **Skills Development:** There is a gap in specialized skill training, particularly in emerging technologies.
- **Infrastructure:** Internet access and digital payment systems need improvement, especially in rural areas.
- **Regulatory Framework:** A lack of clear policies for freelancers, IP protection, and taxation limits industry growth.
- **Global Competitiveness:** Limited international recognition and branding hinder Pakistan's position in the global market.
- **Financial Support:** Access to capital for startups and freelancers remains constrained.
- **Cultural Barriers:** Gender inequality and societal perceptions of freelancing restrict industry participation.

By addressing these gaps through targeted policy initiatives, infrastructure development, educational reforms, and cultural shifts, Pakistan's IT and freelancing industry can achieve significant growth, benefiting from the global digital economy.

## *Conclusion*

The IT and freelancing sectors in Pakistan hold immense potential for driving economic growth and enhancing global competitiveness. This industry, fueled by government initiatives such as DigiSkills, Special Technology Zones (STZs), and tax incentives, have emerged as pivotal contributors to the country's digital economy. Pakistan's IT export sector is experiencing promising growth, driven by a young, dynamic workforce and increasing global demand for digital services. Similarly, the freelancing industry has empowered a growing number of entrepreneurs, creating significant opportunities for digital innovation and skill development. With the government's active support, these sectors have the potential to position Pakistan as a key player in the global digital economy.

However, despite these promising developments, Pakistan faces significant challenges in sustaining and expanding its IT and freelancing industry. Infrastructure deficits, such as unreliable internet connectivity and inadequate power supply, hinder the efficiency of digital operations. Furthermore, regulatory barriers, including complex taxation policies and limited payment gateway options, create obstacles for freelancers and IT businesses seeking to compete on an international scale. The absence of comprehensive data protection laws and weak cybersecurity frameworks further exacerbate the challenges, raising concerns about trust and safety in digital transactions.

To address these issues and unlock the full potential of this industry, strategic reforms and investments are imperative. Strengthening cybersecurity regulations and establishing robust data protection laws will build trust and ensure the safety of digital transactions. Simplifying tax procedures and increasing awareness campaigns for freelancers can help them navigate their obligations more effectively. Expanding international payment gateways, such as PayPal, and improving banking systems will facilitate easier crossborder transactions, enabling freelancers and IT companies to access global markets seamlessly.

Moreover, addressing infrastructure gaps is crucial for supporting sustained growth. Investments in reliable internet connectivity, advanced technology parks, and consistent energy supply will enhance operational efficiency and competitiveness. Skill development initiatives must also be prioritized to equip the workforce with cutting-edge expertise, ensuring they remain competitive in a rapidly evolving global market. Programs like DigiSkills must be expanded to reach underserved regions, fostering inclusivity and equal opportunities for all.

The global demand for skilled digital labor presents a significant opportunity for Pakistan to capitalize on its demographic advantage. With a large pool of talented and cost competitive professionals, the country is well-positioned to attract international clients and investors. However, the rising competition from other nations and cybersecurity risks necessitate proactive measures to sustain competitiveness. By fostering innovation, improving policy implementation, and ensuring institutional reforms, Pakistan can address these challenges and secure its place as a global leader in IT and freelancing.

By the virtue of this study, it has been established that Pakistan's IT and freelancing sectors have demonstrated substantial potential for economic growth and global recognition. Government-led initiatives, combined with private sector dynamism, have laid a strong foundation for success. However, addressing key challenges such as infrastructure deficits, regulatory barriers, and cybersecurity issues is vital for long-term sustainability. By enhancing its strengths, leveraging opportunities, and implementing targeted reforms, Pakistan can solidify its position as a major player in the digital economy, driving progress at both national and global levels.

### *Recommendations and Areas of Improvement*

To enhance the growth and competitiveness of Pakistan's IT and freelancing sectors, several areas require improvement at macro and micro levels. These improvements can help to address current challenges, capitalize on emerging opportunities, and solidify Pakistan's position as a global player in the digital economy.

#### *Recommendations and Proposals for Areas of Improvement (Macro - Level)*

In line with the policy research paper and in view of 80/20 principle, following strategies are proposed for remedial intervention to catalyze the IT export growth by bringing transformation in IT and Freelancing Sector with the help of freelancers and IT professionals:

- i. **Policy Integration:** A stronger, integrated **regulatory framework** that includes global digital trade, **data protection**, and **intellectual property** could support the growth of Pakistan's IT and freelancing industry.
- ii. **Incentive Programs:** Further **government support** for the protection of freelancers' intellectual property and easier tax compliance systems could significantly improve the overall working environment.
- iii. **Infrastructure Expansion:** Increased government investment in **broadband connectivity**, especially in rural areas, would ensure that freelancers across Pakistan have equal access to global clients.

- iv. **VC and Innovation Funds:** By establishing dedicated **innovation and technology funds**, Pakistan could foster the growth of high-potential tech startups and enhance the global competitiveness of its IT sector.
- v. **Curriculum Reform:** Collaboration with international tech giants and local startups can lead to **curriculum reforms** that reflect the evolving demands of the IT industry.
- vi. **Youth and Gender-Focused Programs:** Specific initiatives that **target women and rural youth** for training in digital skills and freelancing can help create a more diverse and robust talent pool.
- vii. **Global Market Integration:** Pakistan could significantly improve its position in the global IT and freelancing markets by facilitating partnerships with global platforms, offering better **tax incentives**, and enhancing **digital trade agreements**.
- viii. **Marketing Pakistan as a Digital Hub:** A national campaign to promote Pakistan's IT and freelancing talent can help improve global perceptions, attracting foreign clients and investors.
- ix. **Targeted Social Programs:** Programs that empower **young women and minority groups** to pursue freelancing careers can unlock a significant talent pool. Offering mentorship and skill development programs specifically for these groups can bridge the gender gap.
- x. **Public Awareness Campaigns:** Promoting the **stability and success** of freelancing careers can help shift societal views on freelancing and attract more young professionals into the industry.

*Recommendations and Proposals for Areas of Improvement (Micro - Level)*

To enhance the growth and competitiveness of Pakistan's IT and freelancing sectors, several areas require improvement at micro level. These improvements can help to address current challenges, capitalize on emerging opportunities, and solidify Pakistan's position as a global player in the digital economy as highlighted below:

- i. **Invest in broadband expansion:** The government and private sector should invest in expanding broadband internet infrastructure, especially in underdeveloped and rural areas.
- ii. **Improve network reliability:** Work with telecom companies to improve network reliability and provide stable high-speed internet connections at affordable rates.



- iii. **Renewable energy solutions:** Encourage the use of renewable energy (e.g., solar, wind) to provide uninterrupted power to tech hubs and freelancing spaces.
- iv. **Grid modernization:** Invest in upgrading the national grid to ensure a stable power supply, especially for tech industries that depend on continuous, highperformance operations.
- v. **Revamp education systems:** Modernize the curriculum at universities and technical institutes to include **hands-on experience, industry certifications, and latest technologies**.
- vi. **Promote continuous learning:** Invest in **online platforms** and **governmentbacked training initiatives** (like **DigiSkills**) that offer relevant technical and soft skills training.
- vii. **Focus on industry-driven certifications:** Encourage certifications in highdemand areas such as **cloud computing, AI, data analytics, cybersecurity, and web development**.
- viii. **Freelancer skill workshops:** Expand programs that provide **freelancing skills** such as time management, negotiation, digital marketing, and tax management to help freelancers operate effectively.
- ix. **Collaborations with freelancing platforms:** Partner with global freelancing platforms like **Upwork** and **Fiverr** to create **specialized training modules** for Pakistani freelancers.
- x. **Simplify tax policies for freelancers:** Develop a clear, **freelancer-friendly tax policy** with specific guidelines for reporting income, claiming deductions, and paying taxes.
- xi. **Create a dedicated freelancing tax framework:** Establish a taxation system that accounts for the unique nature of freelancing work, offering tax exemptions or reductions for IT services or exports.
- xii. **Offer tax literacy programs:** Launch campaigns and workshops to increase awareness about taxes among freelancers and small IT businesses.
- xiii. **Strengthen enforcement mechanisms:** Ensure better enforcement of intellectual property rights (IPR) by improving the judicial process and speeding up litigation.
- xiv. **Raise awareness of IPR:** Launch awareness campaigns to educate freelancers and IT firms about the importance of **IP protection** and how to safeguard their work.

- xv. **Negotiations for PayPal access:** The government should work towards bringing **PayPal** and other international payment platforms to Pakistan, allowing freelancers to access faster, safer, and more reliable payment systems.
- xvi. **Develop local solutions:** Encourage local fintech startups to develop affordable, international-compatible payment systems that can offer low transaction fees and cross-border transaction capabilities.
- xvii. **Promote freelancing globally:** Launch **international marketing campaigns** to promote Pakistan's freelancing market and attract global clients. This can include targeting markets in the **U.S., Europe, and Middle East**.
- xviii. **Government-backed global partnerships:** Form partnerships with leading freelancing platforms to help Pakistani freelancers gain access to large-scale projects and more international clients.
- xix. **Cybersecurity education:** Develop **national cybersecurity awareness programs** for IT businesses and freelancers, teaching them best practices for data protection, securing digital identities, and safeguarding sensitive client information.
- xx. **Government support for cybersecurity tools:** Provide affordable access to **cybersecurity software** and tools for IT companies and freelancers to improve their digital safety.
- xxi. **Develop robust data protection laws:** Introduce a **data protection framework** that aligns with global standards such as the **GDPR** to ensure the safe handling of personal and financial data in both IT and freelancing sectors.
- xxii. **Encourage women in STEM (Science, Technology, Engineering, and Mathematics):** Launch government and private sector programs that actively **encourage women to pursue careers in tech** through scholarships, mentorships, and skills training.
- xxiii. **Support for women freelancers:** Create dedicated **freelancing platforms** for women that provide resources, job opportunities, and community support.
- xxiv. **Workplace diversity policies:** Encourage businesses to adopt **genderinclusive hiring practices** and offer flexible work environments that promote diversity and inclusivity in the tech space.
- xxv. **Increase venture capital investment:** Provide government incentives, **tax breaks**, and **subsidies** for venture capitalists investing in tech startups, especially those focusing on disruptive technologies.

- xxvi. **Foster incubators and accelerators:** Develop and fund more **tech incubators** and **startup accelerators** to help new companies grow, scale, and succeed in global markets.
- xxvii. **Create an innovation-friendly environment:** Reduce bureaucratic hurdles and provide access to seed funding, mentorship, and networking opportunities for tech startups.

Improving Pakistan's IT and freelancing industry requires a multi-faceted approach that addresses infrastructure challenges, enhances education and skill development, simplifies regulations, and opens doors to global markets. By investing in these key areas, Pakistan can unlock the full potential of its IT and freelancing workforce, ensuring long-term economic growth and global competitiveness.

### *Logframe Matrix*

The IT and freelancing industry in Pakistan are facing numerous challenges that hinder its growth and potential. Using the 80/20 principle, a comprehensive overview of the key issues, mitigation strategies, timelines for resolution, and the stakeholders involved, is proposed to promote IT export in the country and effective utilization of freelancer's community for economic growth:

Core Issue	Problem Description	Mitigation Strategy	Responsibility	Timeline
<b>Internet Connectivity Issues</b>	Frequent outages, slow speeds, and restrictions prevent access to global platforms.	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Use reliable VPNs to bypass restrictions.</li> <li>- <b>Medium-term:</b> Improve ISP infrastructure.</li> <li>- <b>Long-term:</b> Advocate for open internet policies.</li> </ul>	PTA, PSEB, MoIT&T, Ministry of Interior, P@SHA, ISPs, Freelancers, IT Associations	Short: 6 months Medium: 1-3 years Long: 5 years
<b>Payment and Compensation Issues</b>	Lack of accessible platforms like PayPal forces costly or inefficient alternatives.	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Use Payoneer and local banking solutions.</li> <li>- <b>Medium-term:</b> Collaborate with</li> </ul>	SBP, Financial institutions, P@SHA, Freelancers, Ministry of Finance, Payment Service Providers, Ministry of Foreign Affairs, Pakistan's Missions/Embassies	Short: 3 months Medium: 2 years Long: 5+ years

		international platforms (e.g., PayPal). - <b>Long-term:</b> Develop a localized payment gateway.	Abroad	
<b>Legal and Regulatory Framework</b>	Lack of standardized contracts, unclear tax obligations, and low awareness of policies.	- <b>Short-term:</b> Raise awareness of local and international tax laws. - <b>Medium-term:</b> Introduce standardized freelance contracts. - <b>Long-term:</b> Create a dedicated legal framework aligned with global practices.	Ministry of Law and Justice, P@SHA, Legal professionals, PSEB, MoIT&T, Freelance Associations, FBR, Local Tax Authorities	Short: 1 year Medium: 3 years Long: 6+ years
<b>Infrastructure and Resource Limits</b>	Inadequate co-working spaces, outdated tools, and inefficiencies in E-Rozgar Centers limit freelancers.	- <b>Short-term:</b> Provide access to free or affordable tools. - <b>Medium-term:</b> Upgrade Software Parks and E-Rozgar Centers. - <b>Long-term:</b> Expand infrastructure to underserved areas.	PSEB, Ministry of IT&T, Private Sector, P@SHA, Freelance Platforms	Short: 6 months Medium: 2 years Long: 5 years
<b>Firewall Deficiencies</b>	Government-imposed firewalls block access to critical platforms, reducing engagement with	- <b>Short-term:</b> Advocate for open internet policies. - <b>Medium-term:</b> Minimize unnecessary restrictions. - <b>Long-term:</b>	Ministry of Interior, Ministry of IT&T, P@SHA, PTA, PSEB, ISPs, Freelancers, IT Associations	Short: 6 months Medium: 3 years Long: 5+ years

	international clients.	Create frameworks balancing security and access.		
<b>VPN Deficiencies</b>	VPNs used to bypass restrictions are often slow, unreliable, or risky.	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Use reliable and secure VPNs.</li> <li>- <b>Medium-term:</b> Promote collaboration with VPN providers.</li> <li>- <b>Long-term:</b> Develop secure alternatives for access.</li> </ul>	Ministry of Interior, Ministry of IT&T, P@SHA, PTA, PSEB, ISPs, Freelancers, IT Associations	Short: 6 months Medium: 2 years Long: 4 years
<b>Skill Development and Mismatch</b>	Training programs and curricula are misaligned with freelancing market demands.	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Promote online certifications and courses.</li> <li>- <b>Medium-term:</b> Partner with global platforms for training.</li> <li>- <b>Long-term:</b> Align academic curricula with market trends.</li> </ul>	Educational institutions, HEC, NAVTTC, P@SHA, MoIT&T, IT training centers, Freelance platforms, National Curriculum Council, Ministry of Federal Education, Provincial Education Departments	Short: 1 year Medium: 3 years Long: 5 years
<b>Software Parks and E-Rozgar Centers Deficiencies</b>	Outdated equipment, poor management, and limited outreach reduce effectiveness.	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Upgrade facilities and improve management.</li> <li>- <b>Medium-term:</b> Expand centers to rural areas.</li> <li>- <b>Long-term:</b> Offer tailored programs for freelancers.</li> </ul>	PSEB, Ministry of IT&T, P@SHA, Ministry of Education, HEC, Private Sector, Freelance Platforms and Associations	Short: 6 months Medium: 2 years Long: 5 years
<b>Cybersecurity Threats</b>	Phishing attacks, data breaches, and identity theft due to weak	<ul style="list-style-type: none"> <li>- <b>Short-term:</b> Launch awareness campaigns.</li> <li>- <b>Medium-term:</b></li> </ul>	IT security firms, National Intelligence Agencies, P@SHA, Freelancers, Freelance Platforms, Ministry of	Short: 6 months Medium: 2 years Long: 4+

	cybersecurity practices.	<b>term:</b> Implement best practices like two-factor authentication. - <b>Long-term:</b> Advocate for stronger laws.	Interior, MoIT&T, PSEB, FIA, PTA, NADRA	years
<b>Social and Cultural Stigma</b>	Freelancing is often seen as illegitimate, especially for women, due to societal norms.	- <b>Short-term:</b> Launch awareness campaigns highlighting successful freelancers. - <b>Medium-term:</b> Incorporate freelancing as a recognized career. - <b>Long-term:</b> Establish national awards.	Ministry of Information & Broadcasting, P@SHA, Media, Educational Institutions, NGOs, Provincial Culture & Women Empowerment Departments, Ministry of Human Rights, National Heritage & Culture Division	Short: 1 year Medium: 3 years Long: 5+ years

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# Critical Evaluation of Automobile and Transportation Industry Policies, Laws and Practices in Relation to Industrial Development in Pakistan

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## Abstract:

The automobile industry in Pakistan plays a pivotal role in the country's economic development by contributing significantly to GDP, generating employment, and facilitating technological transfer. Comprising manufacturing and assembling companies involved in producing passenger cars, motorcycles, and other vehicles, the sector also includes the vital auto spare parts industry. Despite its importance, the industry faces several challenges such as outdated infrastructure, regulatory inefficiencies, and limited technological advancement. This paper provides a historical overview of Pakistan's automobile sector, highlighting key periods of development, including the nationalization era and the deregulation era, which spurred growth in production. Furthermore, the paper examines the market structure, dominated by a few major players, and explores the barriers to entry for new companies. The study concludes by emphasizing the need for a comprehensive, integrated policy framework that promotes innovation, enhances infrastructure, and encourages collaboration among stakeholders to ensure the sustainable growth of Pakistan's automobile industry.

**Key words:** Automobile industry, Pakistan, GDP contribution, market structure, policy framework

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## ***Introduction***

The automobile industry is a vibrant sector in any country and often considered as the mother of all industries and the backbone of the economy. This industry plays a pivotal role in the development of the country in terms of revenue generation, foreign exchange, employment creation, and technology transfer. This industry has a strong impact on a dozen other sectors such as steel, plastic, petrol and vending industry etc.; hence auto sales reflects an important economic indicator of the country.

The automobile industry in Pakistan includes companies engaged in the production and/ or assembling of passenger cars, light commercial vehicles, trucks, buses, tractors and motorcycles. The auto spare parts industry is an allied of the automobile industry and signify a major manufacturing sector in Pakistan.

The auto industry along with its allied industry, auto components, is one of the core industries in Pakistan. This sector contributes around 4 percent to the national GDP and around Rs. 30 billion (USD 108 million) to the national exchequer in terms of taxes and duties. It employs around 0.7 million people as a workforce.

There are currently 124 auto manufacturing facilities in the country, including 34 for 4-wheeler and 90 for 2/3-wheeler, with an investment of Rs. 92 billion and producing around 1.8 million motorcycles and 200,000 vehicles per year. The sector as a whole provides 3.5 million people with jobs and plays a key role in promoting the development of the vendor industry

## **Market Structure**

The market structure of the automobile industry in Pakistan is quite concentrated and in economic terms, it could be best defined as 'Oligopoly' which is characterized by imperfect competition with dominance of few auto assemblers in the market.

The three key market dominating players are (1) Pak Suzuki Motor Co. Ltd, (2) Indus Motors (Toyota), and (3) Honda Atlas Motors. Pak Suzuki Motor Co. has an almost monopoly in the small car segment and faces almost no competition other than the discontinued Daihatsu Cuore, produced by Indus Motors.

The automobile industry is a highly capital-intensive requiring high investments; hence the barriers to entry are high, resulting in the presence of limited number of suppliers. The market can also be categorized as 'price-oriented'. As cars are luxury items, their demand is elastic. Any price change affects the sales of the company to a great extent.

The automotive sector has deep forward and backward linkages; 'backward linkages' in the form of reliance on some vendors for the supply of various components; and 'forward linkages' in the form of dealership networks and agents for the provision of after-sales services.

### **Through the Lens of History**

In 1950, the then Government established the Pakistan Industrial Development Corporation (PIDC) to develop the infrastructural facilities for establishing industries, including automobiles, which the private sector was unable to undertake either because they were technologically complex, needed large capital investment or were less profitable. These steps resulted in almost 56% growth in the manufacturing sector. However, subsequently, the nationalization of industries, including automobile in 1972 retarded the growth of the industry. After deregulation, the automotive industry took off and now the industry is growing fast.

The history of auto making in Pakistan dates back to 1950s when the Kandawala Industries [later renamed as Naya Daur Motors] established its units for assembling buses and trucks and then the National Motors produced the first vehicle in 1953 at its plant in Karachi. The history of the automotive industry in Pakistan can be divided in the following four different time periods:

#### **Developing Era – Initial Years [1950 to 1969]**

Pakistan produced its first vehicle in 1953 at National Motors plant in Karachi in conjunction with General Motors which arranged facilities for the production of Vauxall cars and Bedford trucks. Ali automobiles partnered with Ford trucks and introduced many Ford vehicles. Many other companies like Allwin Engineering, Wazir Ali Engineering, Khawaja Industries, General Tyre Pakistan, Rana Tractors, Raja Auto Cars, Jaffer Industries and Mannoo Motors began operations in the country.

#### **Nationalization Era [1970 to 1989]**

The 1970s saw the nationalization of many companies. Pakistan Automobile Corporation (PACO) was formed in 1972 and many companies were bought out or merged into others.

Wazir Ali Engineering was renamed Sindh Engineering, Ali Autos became Awami Autos, Jaffer Industries to Trailer Development Corporation, Rana Tractors to Millat Tractors to name a few. In 1980 Awami Motors began manufacturing Suzuki pickups while Sindh engineering began producing Mazda Trucks. In 1982, Pak Suzuki started production of vehicles while Hinopak Motors began a joint venture with PACO in 1986 and Gandhara Nissan began production of Nissan Diesel Trucks in 1987.

### **Deregulation Era [1990 to 2009]**

Until the early 1990s, the automobile industry was highly regulated and following deregulation, the next decade witnessed a massive boom in auto production. Suzuki Motors Corporation of Japan increased its ownership to 40% of the shares of Pak Suzuki in 1991. Indus Motors Company began production of Toyota Corollas in 1993 while Honda Atlas introduced manufacturing of Honda Civic in 1994.

From 2001 to 2007, small assemblers and bike importers began assembling replicas of the Honda CD70 bikes using the Chinese technology and collaboration. Afzal Motors began local assembly of Daewoo buses and trucks under license from Daewoo Bus, South Korea. The automotive industry contributed 16% to the manufacturing sector during 2007.

### **Rapid Development Era [2010 to Present]**

In 2010, auto industry predicted a growing demand in Pakistan and invested over Rs 20 billion (US\$ 69 million) over a decade. Motorcycle production hit a record level in 2016-17 with 2.5 million units produced in total. Auto policy 2016-21 also helped lure new automakers in the market which was historically dominated by Honda, Toyota and Suzuki and during this period, automobile industry remained second largest payer of indirect taxes after the petroleum industry.

As a result of the initiatives taken in 2016-21 policy, more than 12 automakers announced to collaborate with different companies in Pakistan; however, some projects like Kia-Lucky, Faw Al-Haj Motors, Nissan Gandhara, Hyundai Nishat motors, Changan-Master, United and Regal materialized; whereas, rest of the investments were either completely pulled off or put on hold like Renault, Volkswagen, Fiat, Zotye and Chery. The installed capacity of cars/SUVs has increased from 275,000 units per annum to 418,500 units.

### ***Problem Statement***

The automobile industry is regarded as the backbone of any economy in terms of revenue generation, foreign exchange, employment creation, and technology transfer. The industry also impacts many other sectors including steel, plastic, petrol and vending industry etc. boosting the financial activity and shaping the outlook of the economy. However, contribution of automobile industry in Pakistan is hovering around 3-4 % of GDP despite many policy interventions. It is therefore imperative to analyze the automobile and transportation industry policies, laws and practices in Pakistan to see their impact in country's industrial development

### ***Scope***

The study will analyze the historical development of automobile industry in Pakistan culminating at ADP 2016-21 and AIDEP 2021-26 as to how and how not they are contributing in industrial development in Pakistan. It will also analyze the role of different governmental entities in promoting automobile industry with possible way forward.

Due to paucity of time, however, the research will focus primarily on just automobile industry and not on other parts of the transportation industry.

### ***Research Methodology***

A Mix methods approach have been used, using both quantitative and qualitative data wherever possible. Most of the sources have been consulted online and data from different primary and secondary sources including Ministry of Industries and Production, Engineering Development Board, Board of Investment, P3A Pakistan and experts' opinion have been used in the study. Besides, different analysis tools have also been used to complete the research.

### ***Situational Analysis***

There are as many as 34 automobile producers in Pakistan (4-wheeler) at the moment (Engineering development board, 2023) but the distribution of market share is still tilted towards the major three companies. Ten (10)

automobile companies are listed on the Pakistan Stock Exchange (PSX) under the sector of 'Automobile Assemblers'. As per PSX, the total market capitalization of these 10 auto makers stands at Rs. 331,723 million.

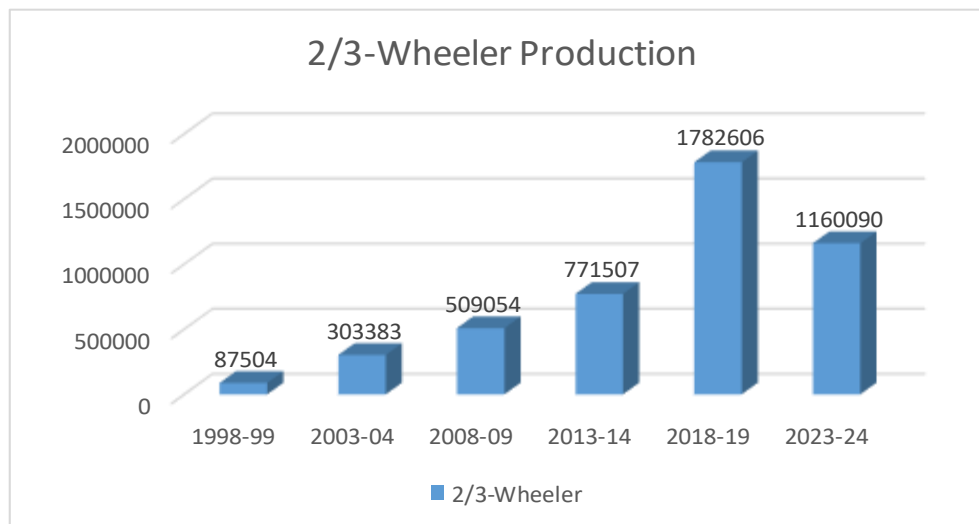
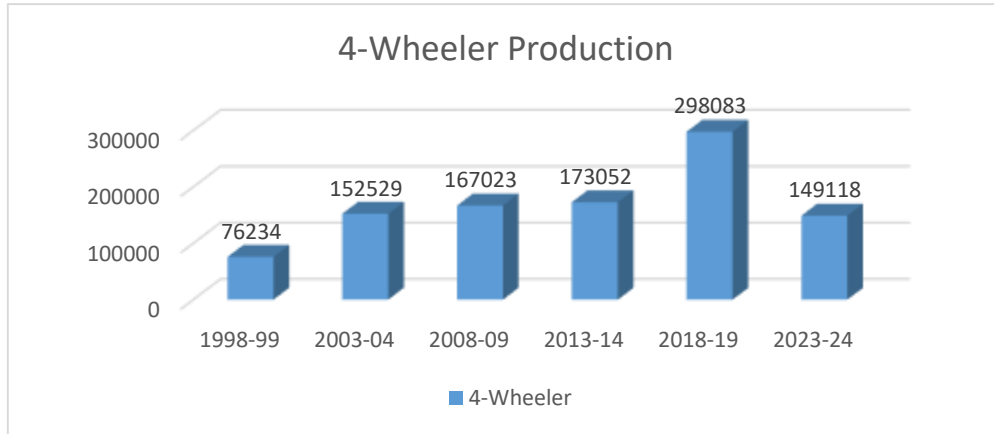
These companies are engaged in the production and assembling of passenger cars and vehicles, buses, trucks and tractors. The major automobile companies are as tabulated below:

- 1) Al-Ghazi Tractors Limited
- 2) Atlas Honda Limited
- 3) Daewoo Pak Motors Limited
- 4) Dewan Farooque Motors Limited
- 5) Ghandhara Industries Limited
- 6) Ghandhara Automotives Limited
- 7) HinoPak Motors Limited
- 8) Honda Atlas Cars (Pakistan) Limited
- 9) Hyundai Nishat Motors Limited
- 10) Indus Motor Company Limited
- 11) Master Motor Corporation Limited
- 12) Millat Tractors Limited
- 13) Pak Suzuki Motor Company Limited
- 14) Sazgar Engineering Works Limited
- 15) Yamaha Pakistan Limited

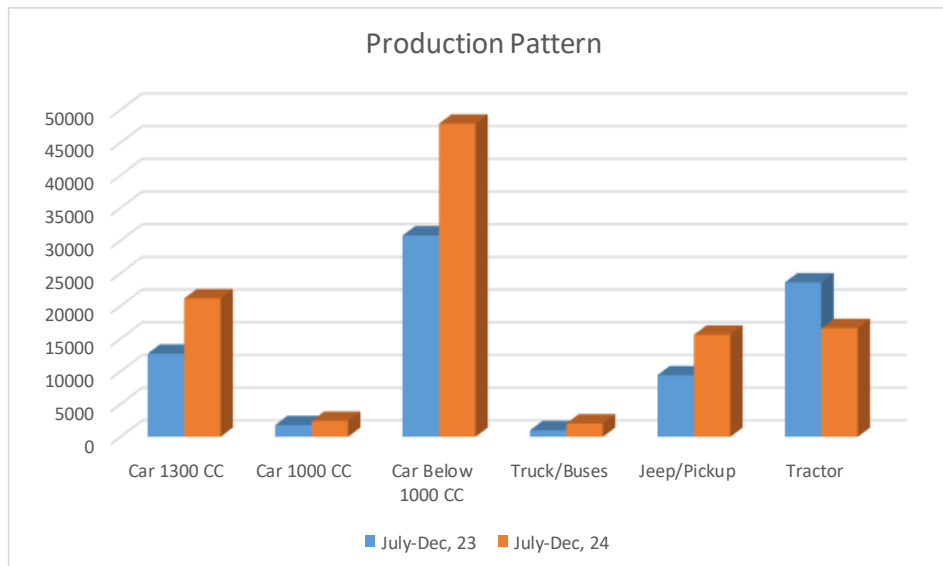
The production capacity of the three major players of automotive sector [Suzuki, Honda and Toyota] have remained unchanged for the past several years. Only the Indus Motor company has expansion plans by investing around USD 40 million which will add around 10,000 units to its current production. There is a dire need for local automakers to significantly increase and enhance their production capacity. The historical production trend of different automobile companies and products is tabulated below:

Vehicle Type	Major Companies	1998-99	2003-04	2008-09	2013-14	2018-19	2023-24
Car	Suzuki, Toyota, Honda	42927	103662	84308	116605	209255	79594
Truck	Isuzu, Master	1083	2022	4993	2674	6035	2204
Bus	Master, Hino	1124	1380	662	558	913	419
Pick up, Jeep	Sazgar, Toyota, Hyndai, Suzuki	4456	9695	17092	18694	31978	21080
Tractor	Millat, Fiat	26644	35770	59968	34521	49902	45821

Total	4-Wheeler	76234	152529	167023	173052	298083	149118
2/3 Wheel	Honda, United, Yamaha	87504	303383	509054	771507	1782606	1160090
Total	All vehicles	163738	455912	676077	944559	2080689	1309208



Period/Type	Car Above 1300 CC	Car Above 1000 CC	Car Below 1000 CC	Truck/ Buses	Jeep/ Pickup	Tractors	2/3 Wheeler
July-Dec, 23	12718	1791	30786	998	9422	23614	543773
July-Dec, 24	21172	2437	47880	2036	15623	16621	698446



## Automobile Industry and National Economic Development

The transformation of an economy is contingent upon the utilization of resources in the most productive manner. Automobile Sector will operate at maximum potential when business conducive environment is created through favorable government policies. Currently domestic auto companies are protected from international competition through tariffs and tax cuts. However, the outcome of policies and performance of the sector have been unsatisfactory due to confinement to assembly of vehicles and nonexistent localization of products.

The automobile industry has not been able to contribute to the national economic development at the expected level owing to a number of issues. Although the government has been trying hard to lift the sector by giving favorable policies but even these has not been that much successful.

## Legal and Institutional Framework for Automobile Industry

Automobile industry has been one of the highest protected industries in the country. In 1990s, assembly of cars started in Pakistan by Pakistan Suzuki, Honda Atlas Motors and Toyota Indus Motors, while the assembly of motorcycles, trucks, and busses started from 2001 to 2007. Being an infant industry, the assemblers were given incentives and protection in the form of tax exemptions and tariffs on the imports of cars along with barriers of entry for new companies. But the policymakers ignored the prerequisites of the protection such as dynamic externalities, potential to mature, technological innovation and spillover effects.

Auto industry in Pakistan did not undergo any research and innovation, and consequently, remained inefficient. It should have become self-sufficient in a given timeframe and the cost of protection faced by society in terms of high prices should have been compensated by price relief after achieving efficiency to ensure consumer and economic welfare. The protection without sufficient empirical analysis has proved to be futile and latent comparative advantage could not be realized as a result of overwhelming regulations, rather it kept the industry inefficient and restricted the scale of operation. In contrast, motor cycle industry flourished and prices remained stable due to removal of trade barriers and entry of multiple companies.

The automobile companies expand their scale of operation and morph assembly plants into manufacturing plants when the demand of vehicles is high and sale exceeds their specific targets. In case of Pakistan, the high cost of cars, low per capita income and myriad taxes have restricted the affordability of citizens and demand from growing. Therefore, auto companies find it more profitable to continue assembly business, governments are complacent on the revenues generated from tariffs and taxes, but consumers are at the receiving end of welfare losses.

### **Motor Vehicle Ordinance, 1965**

The West Pakistan Motor Vehicles Ordinance, 1965, regulates the motor vehicle industry in Pakistan.

**Section 33: Alteration in motor vehicle.** This section requires the owner of a motor vehicle to report to the registering authority any alteration to the vehicle that changes the information on the registration certificate.

**Section 45: Power of Government to control road transport.** This section gives the government the power to regulate the motor transport industry. This includes setting maximum and minimum fares, prohibiting the transport of goods on certain routes, and establishing a Road Transport Corporation.

**Section 105: Sale of vehicle in or alteration of vehicle to a condition contravening this Ordinance.** This section makes it illegal to sell, offer to sell, deliver, or alter a motor vehicle in a way that violates Chapter IV or VI of the Ordinance or any rules stemming from those chapters. This includes the condition of the vehicle at the time of sale and any alterations that would make its use in a public place unlawful.

### **Pakistan Standards and Quality Control Authority (PSQCA)**

The main functions of Pakistan Standards and Quality Control Authority (PSQCA) is to formulate National Standards, Conformity Assessment, Testing of products, Metrology etc. PSQCA advises the Government on standardization policies, programs and activities to promote industrial efficiency and development, as well as consumer protection.



Automobiles Division works under the Directorate of Standards in Pakistan Standards and Quality Control Authority (PSQCA). The main function of Automobiles Division is to foster and promote Standardization in the field of Automobiles (including Road Vehicles, Agricultural Tractors and Farm Machinery) in the country and to facilitate promotion of trade by assisting in the international cooperation through standardization. Automobiles Division is mandated to develop Pakistan Standards and to serve as a platform for assistance to the Government in the field of Automobiles

### **Pakistan Environmental Protection Act 1997**

Regulation of Motor Vehicle under section 15 of Pakistan Environmental Protection Act 1997 is mandated which states that operation of a motor vehicle from which gaseous emission or noise exceeds the NEQS or other standards established by Pak-EPA, has been prohibited. To ensure compliance with the NEQS, the Pak-EPA has been empowered to direct that pollution control devices be installed in motor vehicles or fuels specified by Pak-EPA be used in them or specified maintenance or testing be carried out on them.

The Pakistan Environmental Protection Agency (Pak-EPA) was established under Section 6 (d) of the Pakistan Environmental Protection Ordinance, 1983. The Agency started with meager staff and resources. However, number of action were taken which included notification of NEQS in 1993 for municipal and liquid industrial effluents and industrial gaseous emissions, motor vehicle exhaust, and noise. The functions and responsibilities of the Agency enhanced and it was strengthened technically and logistically to meet the environmental challenges. Pak-EPA also provides technical support to the Ministry of Environment.

### **Introduction of Deletion Program**

In 1985, Indigenization or Deletion Program was introduced in Pakistan under which an attempt was made to shift away from imported inputs for the automobile industry. This plan had to be completed by 2006 to remain compliant with World Trade Organization's (WTO) Agreement on Trade-Related Investment Measures (TRIMs) which disallowed countries to place local content requirements on the domestic manufacturing sector. Though the local automakers were heavily protected as part of the Deletion program; it was unable to achieve the required indigenization that had been envisaged.

## **Formation of Engineering Development Board**

An 'Engineering Development Board (EDB)' was formed by the Government in 1995 with the objective to provide policy direction and formulate long-term policies for the engineering sector. The Board acted as a bridge between the Government and entrepreneurs/investors by adopting an integrated approach to achieve set goals for the overall development of all the subsectors of the engineering industry.

The Board principally agreed to remove all the TRIMs in the industry to make it more competitive and recommended a plan to phase out the deletion program by the year 2000. However, due to slow implementation, only 86 products were phased out from the purview of deletion policy between June 30, 2002 and December 31, 2003. Since then, there is no deletion program for the engineering industry.

The Board is practically non-performing owing to various reasons ranging from capacity issues to staff shortage and lack of resources and presently it is virtually acting as a policy formulation forum with little implementation mechanism. It was assigned to formulate long-term strategic engineering development plan, formulate and coordinate for all government policies related to engineering sector, promote export, enhance technical training, issue guidelines for utilization of technology and manage deletion/indigenization policy but none of the TORs have been achieved in totality.

## **Automotive Development Policy 2016-21**

The government implemented Automotive Development Policy (ADP) in 2016 with an objective: to facilitate higher volume, more investment and better quality with the latest technology; create a balance between industrial growth and tariffs to ensure sustainability of all stakeholders; ensure consumer welfare and provide policy consistency and predictability for investors. The policy aimed at rationalizing import policy, tariff restructuring, and establishment of Pakistan Automotive Institute, financing from commercial banks and incentivized fleet operations.

The components of auto policy are illustrated in Table below:

Category	Description	Tariff Structure
<b>Greenfield Investment</b>	Installation of new and independent auto assembly and manufacturing facilities by an investor for the production of vehicles of a make not already being assembled/ manufactured in Pakistan.	<ul style="list-style-type: none"> <li>• Duty-free import of plant and machinery for setting up the assembly and/ or manufacturing facility on a one- time basis.</li> <li>• Import of 100 vehicles of the same variant in CBU form at 50% of the prevailing duty for test marketing after the ground breaking of the project</li> <li>• Customs duty of 10% on non-localized parts against 32.5% for new investors and 30% for old investors.</li> <li>• Customs duty of 25% on localized parts against 50% for new investors and 45% for old investors.</li> <li>• In the CBU category, customs duty on cars up to 1,800cc engine capacity reduced by 10% for 2-years for old investors and 7-years for new investors.</li> </ul>
<b>Brownfield Investment</b>	Revival of existing assembly or manufacturing plants closed or not operational before July 2013 through investment by owners or new investors or joint ventures.	<ul style="list-style-type: none"> <li>• Import of non-localized parts at 10% rate of customs duty and localized parts at 25% duty for a period of 3-years for the manufacturing of Cars and LCVs.</li> <li>• Import of all parts (both localized and non-localized) at prevailing customs duty applicable to non-localized parts for manufacturing of trucks, buses and prime-movers for a period of 3-years.</li> </ul>

As a result of the initiatives taken in 2016-21 policy, more than 12 automakers announced to collaborate with different companies in Pakistan; however, some projects like Kia-Lucky, Faw Al-Haj Motors, Nissan Gandhara, Hyundai Nishat motors, Changan-Master, United and Regal materialized; whereas, rest of the investments were either completely pulled off or put on hold like Renault, Volkswagen, Fiat, Zotye and Chery. The installed capacity of cars/SUVs has increased from 275,000 units per annum to 418,500 units.

The efficacy of policy can be assessed from the outcome: although few companies have entered the auto industry in Pakistan, yet the scale of operation remains confined to assembly, there was no significant increase in sales, prices of vehicles remain high and out of the reach of majority, transfer of technology did not happen and local manufacturing of vehicles is not an objective of auto companies in near future. The main components of vehicles such as engine, transmission, gearbox, axles, ignition system, clutch system, braking system and motors are still imported by the auto companies.

Under the ADP 2016-21, the Board of Investment (BOI) has been designated as the 'single point of contact for the investors with the government. Any new investor shall be required to submit a detailed business plan and relevant documents for the manufacturing of vehicles to the Board of Investment. BOI would get the Business Plan assessed by the Engineering Development Board (EDB).

### **Auto Industrial Development and Export Policy 2021-26**

Auto Industrial Development and Export Policy AIDEP (2021-26) was continuation of earlier Auto Development Policy ADP (2016-21) to further strengthen the auto sector and provide significant support to economy of Pakistan by ensuring import substitution, export enhancement, job creation for local workforce and implementation of safety regulations. Under the AIDEP 2021-26, export targets for the auto industry were fixed as a percentage of their annual imports from 0% in the 1<sup>st</sup> year, 2% in 2<sup>nd</sup> year, 4% in 3<sup>rd</sup> year, 7% in 4<sup>th</sup> year, and reaching to 10% in the 5<sup>th</sup> year.

The AIDEP 2021-26 continued most of the incentives given to the automobile industry in ADP 2016-21 however special incentives have been given to electric and hybrid vehicles. Only 1% custom duty was levied on EV specific parts including battery, motor, converter, charger etc till the end of policy period i.e. 30 June, 2026. Similarly, customs duty on import of electric buses, trucks and prime movers in completely built condition is also fixed at 1%.

However, review of the relevant documents discloses that most of the 4 wheeler OEMs did not meet their 2% export targets for FY 2022-23 and their manufacturing licenses & annual quotas for import of CKD kits were not renewed after 30<sup>th</sup> Sept 2023. On intervention of SIFC, a further three months import authorization was issued to all imports-cum assemblers till 31<sup>st</sup> Dec 2023 on the condition that they will submit their export plans by that date. Thereafter, OEMs have obtained interim stay orders from Courts wherein interim relief was granted with direction to continue providing them import authorization including uploading of the material quota.

**Court Cases pertain to SRO 656 (Mandatory Export) and SRO 693 (Localization)**

S. No	Company	Case / CP No	Court	Status
1	Lucky Motors (Main case)	5047/2023	Sindh High Court	Comments submitted to SHC
2	Hyundai Nishat	79/2024	Sindh High Court	Comments submitted to SHC
3	Regal Automobiles	132/2024	Sindh High Court	Comments submitted to MOIP
4	Foton JW Auto	177/2024	Sindh High Court	Comments submitted to SHC
5	Master Changan	318/2024	Sindh High Court	Comments submitted to Law Division
6	Master Motor	381/2024	Sindh High Court	Comments submitted to Law Division
7	Sazgar Engineering	80/2024	Sindh High Court	Comments submitted to Law Division
8	Indus Motors	238/2024	Sindh High Court	Comments submitted in the SHC
9	Pak Suzuki			
10	Hino Pak			
11	Gandhara Automobiles			
12	Gandhara Industries			
13	Gandhara DF			
14	Al Haj FAW	669/2024	Sindh High	Comments submitted in the

			Court	SHC
15	Al Haj Automotive	670/2024	Sindh High Court	Comments submitted in the SHC
16	Automobile Corporation Pak	659/2024	Sindh High Court	Comments submitted to Counsel
17	Honda Atlas Car (SRO 693)	6085/2023	Sindh High Court	Comments submitted in the SHC
18	Indus Motors (SRO 693)	5737/2023	Sindh High Court	Comments submitted to SHC
19	Honda Atlas Car (SRO 693)	571/2024	Sindh High Court	Comments under preparation
20	Honda Atlas Car (SRO 693)	1946/2024	Sindh High Court	Comments submitted to Counsel
21	MG JW Automobile Pakistan	874/2024	Sindh High Court	Comments submitted in the SHC
22	Honda Atlas Car	68730/23	Lahore High Court	Comments submitted to LHC
23	Al Ghazi Tractors	4795/2024	Lahore High Court	submitted in the LHC
24	United Motors Pvt Ltd	1103/2024	Sindh High Court	Copies of petition are awaited
25	Dysin automobiles ltd	990 / 2024	Sindh High Court	Copies of petition are awaited
26	Orient Tractors	21397/24	Lahore High Court	Comments under preparation

The AIDEP 2021-26, while sharing a common vision with ADP 2016-21, fail to adequately address critical issues facing the auto industry such as high vehicle costs, inefficient manufacturing practices, limited technological innovation and a lack of focus on component localization. Tax cuts and higher tariffs on imported parts are unlikely to incentivize local vehicle manufacturing. Since almost all companies are in court at the moment so the policy and its intended goals are shelved at the moment.

## **Tax Structure**

Taxation constitutes almost 40 percent of the total price of locally-manufactured cars which is also the real cause behind the high prices of cars in Pakistan. The value includes at least seven taxes and levies, viz. customs duty, additional customs duty (based on engine size), income tax, general sales tax, federal excise duty, withholding tax, and registration tax. Additionally, there are import duties and taxes on raw materials. There is withholding tax in the auto sector; some are adjustable and some non-adjustable. In addition to 18% Sales Tax, Federal Excise Duty (FED) is also imposed on the finished products. This multiple level taxation needs to be rationalized.

## **COMPARATIVE ANALYSIS WITH GLOBAL BEST PRACTICES**

There are many success stories in the world where auto industry has developed and now holds a major share in their respective gross domestic products (GDP). We have analyzed the automobile industry of Thailand and Malaysia to see their experience of growth. The analysis will help to comprehend the policies adopted by these countries to promote domestic manufacturing of vehicles instead of confining to the assembly.

### **Automobile Industry of Thailand**

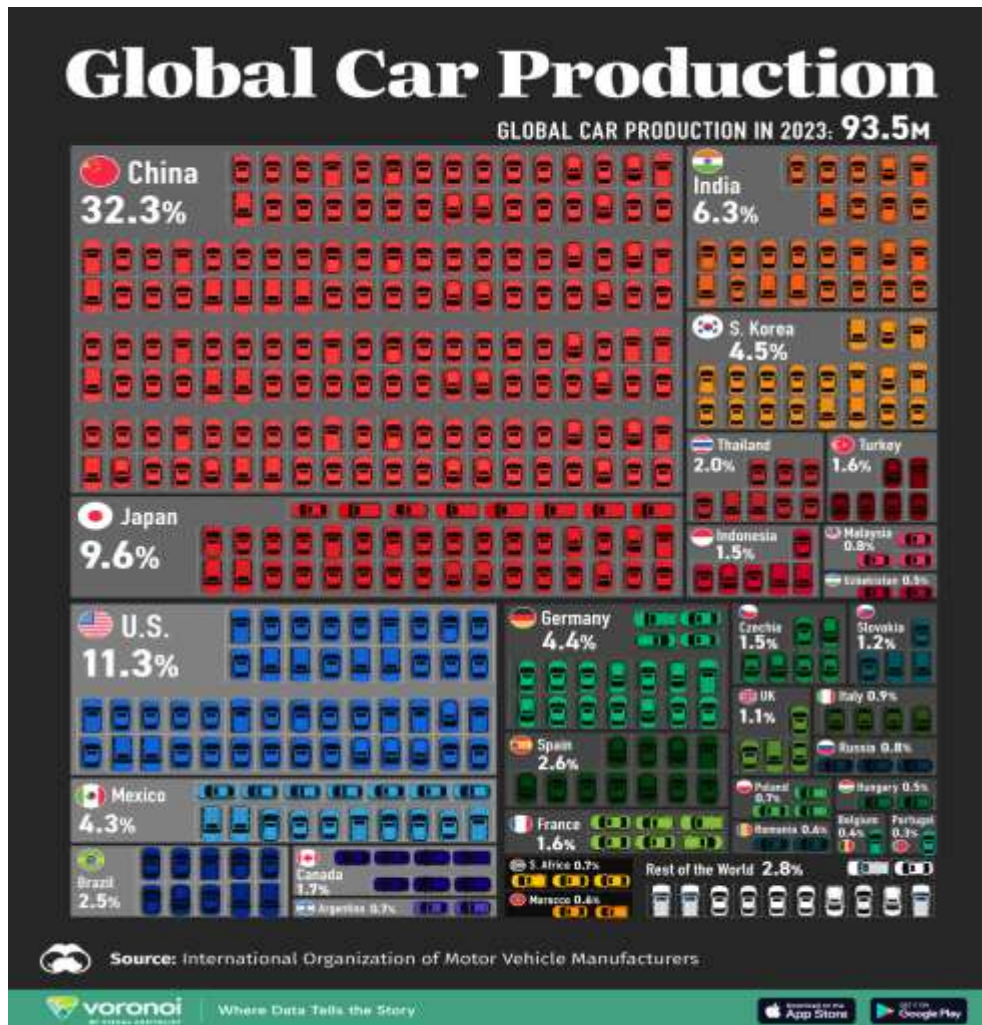
The Thai automotive industry exemplifies a successful transition from import substitution to global integration. Initially focused on domestic production through protective tariffs, it has evolved into a major player, ranking third in Southeast Asia and 12th globally, with annual production capacity exceeding 2 million vehicles. This growth, from a modest 160,280 units in 1989 to over 2 million reflects the industry's remarkable transformation. The annual auto industry exports of Thailand stood at \$21.4 billion in 2020 compared to \$1.2 billion in 1999.

A key factor in Thailand's success has been the strategic implementation of Local Content Requirements (LCRs). By mandating the use of domestically produced parts in some percentage of the total value of the vehicle, the government fostered the development of a robust local component manufacturing base. This proactive approach, unlike many other developing countries that solely relied on import substitution, has proven highly effective in driving industrial growth and enhancing competitiveness.

The gradual increase in the tariffs along with the increase in share of local manufactured parts in the assembly of vehicles enabled the domestic manufacturing of vehicles. From 1960 to 1998, the government of Thailand opted import substitution policies along with alluring investment in the

manufacturing of parts and LCR, and was successful in transforming assembly operation to manufacturing and enhancing the competitiveness of the local manufacturers

Thailand's commitment to global integration is evident in its early adoption of the WTO's Trade-Related Investment Measures (TRIMS) agreement. It was the first developing-country WTO member to do so. This proactive step, taken in 1998, marked a significant shift away from protectionism and towards a more open and competitive market. The LCR was also abolished in January 2000.



### Chronology of Automobile Industrial Development Policy of Thailand:

1960s:

- Tariffs on CBUs (Cars 60% - Vans 40% - Pickup Trucks 20%).



- Tariffs on CKD kits (Cars 30% - Vans 20% - Pickup Trucks 10%)

**1974:**

- Implementation of local content requirement (LCR)
- Assembled vehicles must use locally produced parts to at least 25% of the total value of the vehicle.

**1978:**

- Ban on imports of CBUs and duty of 80% on imports of CKD kits.
- Later Tariffs of 150% on imports of CBUs.

**1982:**

- LCR requirement for all vehicles set at 45%

**1983:**

- Intermediate inputs imported by firms exporting more than 30% of production were exempted from import duties

**1985:**

- LCR for passenger cars increased to 54%.
- List for compulsory and non-compulsory parts introduced

**1991:**

- Announcement of National Car Policy and start of local production of the diesel engine

**1994:**

- Domestic auto parts suppliers of assemblers were exempted from all taxes to promote backward linkages of auto industry.
- LCR requirement of 70%

**1997:**

- Abolished local ownership requirement on foreign-invested projects and ban on new assembly plants

## **Automobile Industry of Malaysia**

The Malaysian automotive industry serves as a model for successful industrial transformation that has evolved from basic vehicle assembly to a significant manufacturing and export hub. Today, Malaysia boasts the third-largest automotive industry in Southeast Asia and the 23rd globally, producing over 500,000 vehicles annually with a market value exceeding \$20 billion. This thriving sector comprises 27 vehicle producers and over 640 component manufacturers.

The automotive industry was established in 1963 with high tariff protection and was similar to Thailand's in terms of tariff protections and import substitution policies till 1970s. A key factor in Malaysia's success has been the strategic role of state-owned companies. Their involvement has driven the localization of parts manufacturing and fostered the growth of allied industries, contributing significantly to the industry's overall development. Despite continued protectionist measures, this focus on domestic production has fueled substantial industry growth.

### **Chronology of Automobile Industrial Development Policy in Malaysia**

#### **1966:**

- Tariff on CBUs (30% to 80% depending upon engine capacity)
- Tariffs on CKD kits and parts (20% to 30%)

#### **1972:**

- Implementation of localization Policy
- Vehicle must have 10 percent of the locally produced content

#### **1979:**

- Implementation of Deletion Program
- Ban on the import of 200 parts that were produced locally

#### **1982:**

- Localization of parts was increased from 10 percent to 35 percent.

#### **1983:**

- Announcement of National Car company (Proton)
- Joint venture signed between Mitsubishi and Industries Corporation of Malaysia
- Protection of National Car
- Tariffs on CBUs (80% to 150% depending upon engine capacity)
- Tariffs on CKD kits and parts (40% to 60%)

#### **1984:**

- Exports of Proton
- Agreement signed with car dealer in U.K. for the exports

#### **1991:**

- Announcement of Second National Car Company (Perodua)
- Production started in 1994 with same level of protection as Proton

#### **1995-2005:**

- Protection
- Tariffs on CBUs (140% to 300%)

- Tariffs on CKD kits and parts (40% to 80%)

## Actionable Policy Insights for Pakistan from Thailand and Malaysia

In 1960s, both Thailand and Malaysia had similar kind of automobile industry as of Pakistan which was protected by tariff. They were just assembling the auto parts with little local input and were ultimately dependent on imports. However, both countries introduced local content requirement (LCR) policy in early 1970s and initially 10% components were required to be local. This ratio was gradually increased that allowed local manufacturing to grow and decreasing reliance on imports. They also taxed the import of CBUs heavily but all these steps were very systematic to avoid any disruption of supply chain.

Pakistan's Automobile Industry can have certain insights from the growth of the automobile industry in Thailand and Malaysia based on their historical growth.

- The policy and transition needs to be systematic and sustainable. No long-term change can be brought abruptly.
- Prolonged protectionism discourages operational efficiency and kills market competitiveness.
- Local Content Requirements (LCR) should be enhanced gradually but it must be in measurable terms i.e. percentage.
- Taxation on CBUs and CKD kits should be increased in direct proportion to the LCR. This will encourage the assemblers to invest in R&D and innovation in collaboration with local industry.
- Enhancing the capacity of local industry is a prerequisite to attain any kind of indigenization.
- Private sector should be part of the consultative and decision-making process.

It is only with the adoption of these time tested measures, Pakistan can attain the goal of indigenization in automobile and transportation industry.

## *Analysis*

**SWOT Analysis:** Engineering Development Board (EDB) is the organization responsible for development of automobile industry in Pakistan. In order to see the role of this organization in promoting industrial growth and economic development in the country, its SWOT/EETH analysis is being undertaken. The following are the strengths, weaknesses, opportunities and threats for Engineering Development Board (EDB).



**EETH Analysis:** The following are the steps to be taken by Engineering Development Board (EDB) for enhancement of strengths, elimination of weaknesses, taking advantage of opportunities and to hedge against threats.

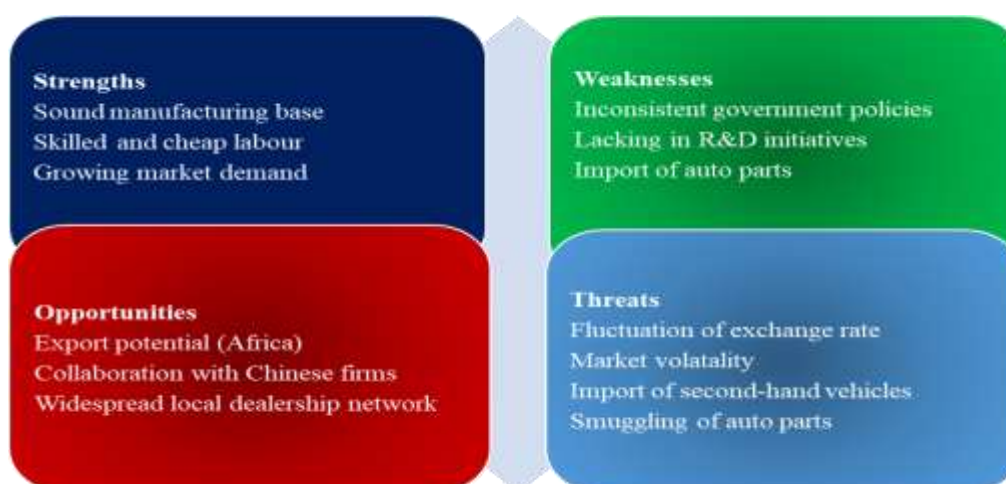


**Stakeholders Analysis:** The following are the stake holders to the issue who have different interests, power related to issue and they can play a vital role towards an amicable resolution:

- i. Ministry of Industries and Production
- ii. Engineering Development Board
- iii. Board of Investment, FBR
- iv. Pakistan Automotive Manufacturers Association
- v. Pakistan Association of Automotive Parts and Accessories Manufacturers
- vi. Dealers and Distributors
- vii. Regulatory Bodies
- viii. Consumers

S. No	Stakeholder	Interest	Influence	Expectation
1	Ministry of Industries and Production	Industrial Growth	High	Compliance of policies
2	Engineering Development Board	Industrial Growth, employment	High	Contribution to industrial growth
3	Board of Investment, FBR	Investment, taxes	High	Foreign exchange revenue generation
4	Pakistan Automotive Manufacturers Association	Profitability, market share	High	Quality products
5	Pakistan Association of Automotive Parts and Accessories Manufacturers	Business growth, technical support	Medium	Quality products
6	Dealers and Distributors	Sales growth	Medium	Timely delivery
7	Regulatory Bodies	Safety and environment standards	High	Compliance with regulations
8	Consumers	Quality products	Low	Fair pricing

**SWOT Analysis:** SWOT analysis of Pakistan's Automobile Industry was undertaken to analyze its preparedness to meet the future challenges and align with available opportunities within the country as well as in the global auto market. The following are the strengths, weaknesses, opportunities and threats of Pakistan Automobile Industry.



## OXFORD INDEX OF PUBLIC ADMINISTRATION (OIPA)

Pakistan is ranked at 90 with 0.41 index score in the Blavatnik School of Government's Oxford Index of Public Administration 2024 (OIPA). Country's performance in data availability is even more deplorable with the lowest ranking in category D. We analyzed Pakistan's automobile and transportation industry against different domains and their themes to evaluate public administration, governance and service delivery:

### Strategy and Leadership

The key areas of public Strategies and Leadership/Administration are strategic capacity, cross-government collaboration, openness, communication, integrity, and innovation. Pakistan ranks 104 out of 120 in the domain of Strategies and Leadership.

**Strategic Capacity.** There have been frequent changes in Auto policies, tariffs and taxes etc.

**Cross Government collaborations.** The main stakeholders i.e. Ministry of Industries and Productions, Ministry of Commerce, Ministry of Science and Technology, Engineering Development Board, Board of Investment, Federal Board of Revenue and others have not coordinated linkages, resulting in poor implementation.

**Openness and Communication.** Policy formulation involves limited involvement of stakeholders both from Government and private sector. Policy is not circulated among stakeholders for input. Cottage industry input in manufacturing of spare parts is not taken. The result is irrational policies contrary to the ground realities.

**Integrity.** There is widespread corruption in regulatory authorities and malpractices which not only hinder policy implementation but licensing regime.

**Innovation.** No steps for innovation has been taken by Government sector and as such environment is not conducive for innovation. The country remains dependent on Completely Knocked Down Kits (CKD Kits) and does not encourage indigenous production.

## Public Policy domain

The key areas of Public Policy Domain/Governance are policy making, financial management, regulation, crisis and risk management and use of data. Pakistan ranks comparatively better at 79 out of 120 in the Public Policy Domain.

**Policy Making.** Policy making in Pakistan's auto sector has been inconsistent with frequent shifts in automobile policies, especially regarding import duties, localization requirements, and incentives for electric vehicles (EVs). The implementation of policies has also been weak.

**Financial Management.** The government imposes high tariffs on imported vehicles and parts to protect local manufacturers, generating significant revenue but this results in increased vehicle costs for consumers. Public-private partnerships for R&D and infrastructure development are scarce.

**Regulation.** The regulatory framework is corrupt, inefficient and itself an obstacle in the auto industries growth. Its licensing regime is the biggest obstacle.

**Crisis and Risk Management.** The sector faces multiple risks, including supply chain disruptions due to exchange rate volatility, global trade issues, and local political instability. Crisis management strategies are reactionary rather than proactive, with limited capacity to anticipate and mitigate risks. A lack of coordination between the public and private sectors in addressing systemic risks further exacerbates vulnerabilities. Insufficient support for SMEs in the supply chain makes the sector less resilient to economic shocks.

**Use of Data.** There is limited data collection in the auto industry. The use of Technology is minimal. The absence of centralized data of all stakeholders, auto setups and spares manufacturing facilities make it hard to take informed and evidence based decisions in policy making process and monitoring overall performance of the sector.

## National Delivery

The key areas of National Delivery/Service Delivery are system oversight, digital services, tax administration, border services and social security. Pakistan ranks at 96 out of 120 in the domain of National Delivery.

**System Oversight.** Regulatory bodies lack the technical capacity and autonomy to effectively monitor and implement sectoral policies. Corruption and political interference further weaken system oversight resulting in limited accountability for manufacturers.



**Digital Services.** Digitization in both private sector and public sector is very rare. There is some progress in registration by provinces but there is a lack of central data base to integrate stakeholders in a single system.

**Tax Administration.** The Government collects significant revenue from tax collection on auto parts, CKD kits, Completely Built Units (CBUs), sales taxes, import duties and vehicle registration fee. However, tax compliance in the sector is challenging due to under-invoicing, tax evasion and a weak audit mechanism.

**Border Services.** Pakistan's auto industry relies heavily on imported CKD kits, spare parts and raw materials, while border services are inefficient and non-transparent which results in delays of consignments increasing costs and disruption of supply chains. This is mainly due to the absence of advanced customs technologies like automated clearance systems at ports and borders.

**Social Security.** The Majority of workforce in the auto sector is concentrated in assembly plants, dealership networks and parts suppliers. There are very limited formal labor contracts thus hindering social security of the workforce. Furthermore, little opportunity for skills upscaling of workers is available.

## **People and Processes domain**

The key areas of People and Processes Domain are employees' engagement, diversity and inclusion, HR management, procurement and technology and workplaces. Pakistan ranks at 88 out of 120 in the domain of People and Processes.

**Employees Engagement.** A significant number of employees are engaged in auto parts manufacturing, distribution and service networks, however, little weightage is given to professional degrees / programs. Moreover, worker unions are weak limiting collective bargaining and opportunities for employees to voice concerns. This results in low morale and productivity especially in labor intensive segments like auto parts manufacturing.

**Diversity and Inclusion.** The auto sector is dominated by male with little opportunities for women and other underprivileged groups in both managerial and technical roles. The marginalized groups or persons with different abilities are not prioritized for inclusion.

**HR Management.** While large multinational companies have global HR standards, local firms do not have formal HR policies. Workforce formalization is very limited with majority of workers without contracts.

Skill development initiatives are insufficient, leaving workers ill-prepared for technological advancements such as those required for electric vehicle (EV) production.

**Procurement.** Procurement practices in the auto sector are inefficient and relies heavily on imported parts and CKD kits due to low localization. Due to corruption and lack of transparency, the procurement process often leads to inflated costs which are passed on to the consumer.

**Technology and Workplaces.** While multinational companies have adopted the modern technologies, the local manufacturer still rely on the old and outdated methods and machinery. Majority of the auto parts industries do not have international standard hygiene and safety standards. The lack of modern technologies hamper innovation.

## **Gap Analysis of Pakistan's Service Delivery in Automobile Industry**

Based upon the Blavatnik School of Government's Oxford Index of Public Administration (OIPA) framework, a GAP analysis of Pakistan's service delivery performance related to the automobile and transportation industry, in comparison to Thailand and Malaysia, was conducted and following gaps transpired that require policy interventions:

**Local Content Development:** Pakistan's auto industry depends heavily on imported CKD kits and lacks a strong local component manufacturing base dissimilar to Thailand and Malaysia. This dependence on imports makes the industry vulnerable to external shocks and impedes the growth of a strong domestic supply chain.

**Strategic Policy Implementation:** Pakistan's auto policies have been inconsistent and lack the strategic approach manifested in Thailand and Malaysia. Frequent changes in policies, especially concerning import duties and localization requirements create uncertainty for investors and thwart long-term planning.

**Government Support and Intervention:** Thailand and Malaysia have demonstrated a more proactive and strategic role of government in supporting the auto industry. Pakistan's government interventions have been less effective, and issues like corruption and political interference further impede progress.

**Focus on Innovation:** While Thailand and Malaysia have made progress in nurturing innovation and technological advancement in their auto industries, Pakistan lags behind. The absence of a conducive environment for modernization keeps the country dependent on CKD kits and limits the

potential for developing local production capabilities.

Pakistan can learn from

the Thailand and Malaysia model and with these modest policy interventions, it can boast its automobile industry and curtail import bill besides providing economically efficient vehicles for the public.

## Gap Analysis/Challenges

As the GAP analysis transpire, the automobile industry faces major challenges at different levels including at policy level, at Engineering Development Board level and some are directly related to the industry. Some of the key challenges faced by automobile sector, hampering its growth and contribution to the national economy are as narrated below:

### Policy Level:

- i. There is no integration of different government departments dealing automobile sector. Furthermore, there is very limited data collection in auto sector and no central database is available to integrate the auto manufacturers, auto parts manufacturers, their associations and other allied industry. This results in serious gaps between different stakeholders and in policy formulation.
- ii. Prolonged protection has diminished incentives to improve and contributed to inefficiency, economic losses and unproductive utilization of resources.
- iii. Trade barriers have restricted the transfer of technology and resulted in a decline in productivity.
- iv. Lack of focus on component localization have impaired the local industry.
- v. Systematic transition of the policy from CBUs, SKDs, and CKDs to complete indigenization has not been done so far.
- vi. High tariffs and taxes have soared the prices resulting in the inability of the majority to afford vehicles domestically and declined competitiveness internationally.

### EDB Level:

- vii. Long-term auto-specific Industrial Policy has not been devised.
- viii. There are no defined processes for installation and operationalization of an industry. Similarly, no timelines are prescribed with the processes which results in redundant bureaucratic delays.
- ix. There is minimum representation of the automobile industry in the EDB which results in policies that are not implementable.

- x. Study on reasons of stagnancy in car production and success stories of other auto making countries needs to be undertaken.

**Industry Level:**

- xi. Uncertainty emanating from short-term policies has mired foreign investment in the country and portends the existing automobile industry.
- xii. Dependence on limited products and markets has stagnated the exports of the country. Increasing volumes to rationalize prices of vehicles needs to be done.
- xiii. Absence of mechanism for localization of components in the auto policies has restricted the backward linkages of auto industry.
- xiv. The automotive industry has not aligned with auto part manufacturing sector which has resulted in lack of R&D and innovation in the later.
- xv. Integration of formal and informal auto and auto part manufacturing sector has not been done. Majority of the auto parts manufacturers are informal and unorganized. There are 2,200 auto parts manufacturing units, out of which 450 are organized and in tier 1, 425 in Tier 2 and 1325 are unorganized and after-market suppliers.
- xvi. Inept engineering practices are being adopted by majority of the component manufacturers especially in the unorganized and informal auto sector, with a significant portion relying on machinery from the 1980s. Similarly, most of the skilled labor is not trained on new and sophisticated manufacturing machinery.
- xvii. Market volatility and unrestrained imports and smuggling are also a major challenge for the industry.
- xviii. Disclosure of value and share of imported and local materials used in auto assembly in not being done by any of the company.

## *Conclusion*

The automobile and transportation industry is an important sector of Pakistan's economy that is contributing considerably to GDP, generating employment and fetching foreign exchange for the country. The industry has seen a remarkable growth over the stretch of history and at the moment there are 124 different automobile assemblers and manufacturers in Pakistan, with 34 dealing in 4-wheelers and 90 in 2/3-wheelers, but the main focus of the industry has been on maintaining the assembly line instead of building proper manufacturing setups.

The growth and development of the automobile industry is hindered by inadequate policy frameworks, relevant laws, tattered practices, insufficient investment in infrastructure, limited adoption of technology and innovation, bureaucratic delays and corruption and lack of skilled workforce coupled with inadequate training programs. Besides, there is no integration between different government departments, industry and other stakeholders.

The way forward however lies in integration of the policy makers, industry stakeholders, and other relevant parties to develop a comprehensive policy framework that promotes industry's growth and development. We also need to encourage the adoption of technology and innovation including electric vehicles along with streamlining the regulatory processes to reduce unnecessary bureaucratic delays. Development of special training programs and availability of skilled and economical workforce is also necessary.

By addressing these challenges and implementing effective and inclusive policies and improved practices, Pakistan's automobile and transportation industry can achieve sustainable growth and development whereby contributing to country's economic prosperity and improving the quality of life for its citizens.

## *Recommendations*

Being a very complex and significant issue, it needs a very integrated and multi-faceted action plan to tackle the issue and revive the automobile industry in Pakistan. The following actions are proposed at different levels and involving various stakeholders of the issue.

**Policy Level:** There are about a dozen ministries that are somehow related to the automobile policy that include Ministry of Industries and Production, Ministry of Commerce, Ministry of Science and Technology, Ministry of Climate Change, Federal Board of Revenue, Board of Investment and many others but there is hardly any coordination or integration among these different stakeholders.

Engineering Development Board, to an extent, was entrusted with this role but it also failed in this role. It is therefore very crucial to make coordination among these stakeholders.

Systematic transition of the policy needs to be made on Thailand and Malaysia model with gradual shifting from CBUs, SKDs, and CKDs to complete indigenization. Although there is some progress but it's not uniform.

Manufacturer/Assembler	Product	%age Deletion Achieved
M/s Pak Suzuki Motor Company Limited, Karachi	Suzuki Mehran Car, 800cc	73%
	Suzuki Cultus Car, 1000cc	69%
	Suzuki Pickup, 800cc	70%
	Suzuki Bolan Van, 800cc	68%
	Suzuki Swift Car	38%
	Suzuki Cargo Van	68%
	Suzuki Wagon	32%

The systematic approach will ensure transition from CBUs and assembling to local manufacturing but without the supply chain disruption. The current policy is just compilation of ideas as it has a list of wishes but no means defined to attain that.

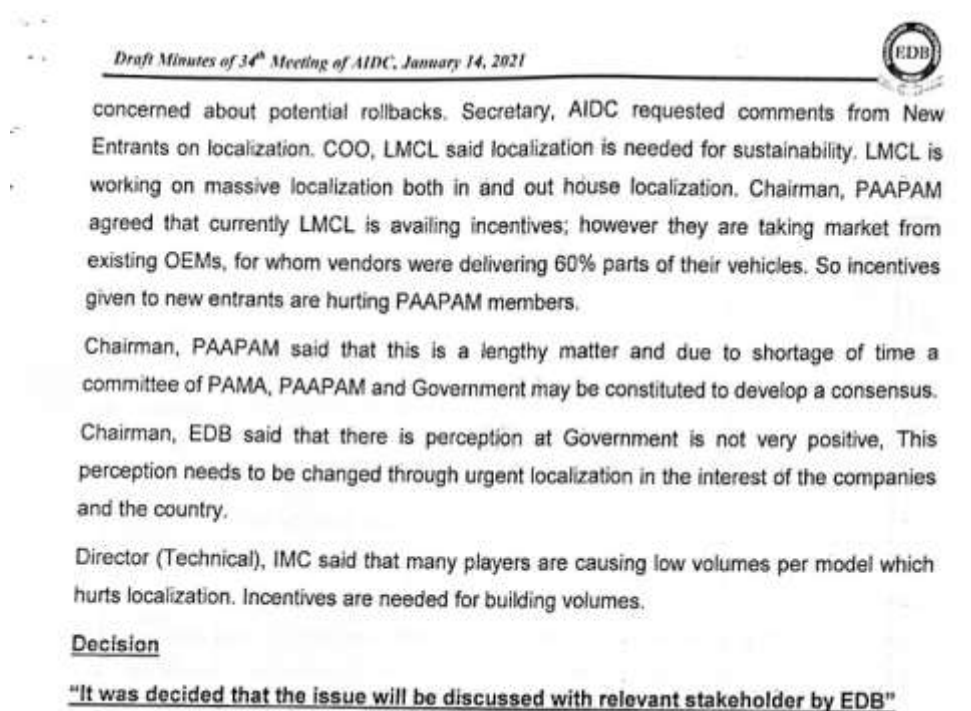
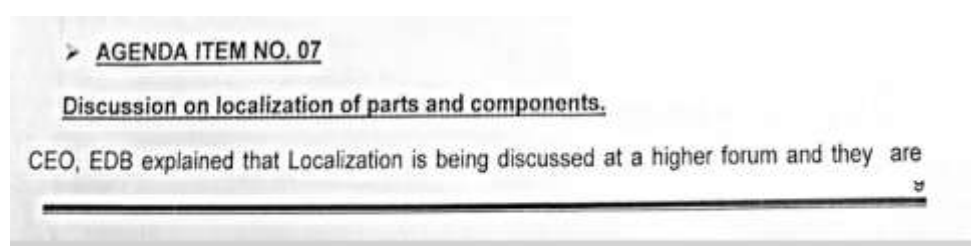
A comprehensive database should be developed to integrate the auto manufacturers, auto parts manufacturers, their associations and other allied industry. This would balance the demand and supply and will boost the local industry besides lessening the cost of doing business.

A national electric vehicle (EV) policy should be developed to encourage the adoption of EVs, giving incentives for manufacturers, importers, and consumers. As a pilot project, PPP may be undertaken to introduce and operationalize EV infrastructure in 2, 3 major cities. Government may also extend easy credit to private sector and individuals on low markup for adoption of EV.

The Government must provide tax incentives and grants for investment in modern machinery and processes to the small and medium size auto parts manufacturing setups and encourage partnerships with international technology providers for technology transfer. The three key players of automobile industry, Suzuki, Toyota and Honda can also bound to invest in R&D and local partnerships.

6. Taxes constitute about 40% of locally manufactured/assembled vehicles price and if government reduces these taxes considerably, it will decrease the prices drastically encouraging new buyers and that in return will result in additional manufacturing. Increased volumes will further rationalize prices of vehicles and the whole production, affordability and consumption cycle will be enlarged.

### Engineering Development Board:



These are the minutes of the 34th Meeting of the Auto Industry Development Committee of EDB held on 14<sup>th</sup> January, 2021 held in the committee room of BOI. It shows the interest and commitment of EDB on this important issue of localization of parts and components, a major step for indigenization.

7. The EDB should develop a comprehensive automotive policy, establish a clear vision, mission, and objectives for the industry's development, including targets for localization, exports, and employment generation. But these targets must be measureable KPIs so as to track the progress achieved and further interventions required.

8. The regulatory processes need to be streamlined so as to reduce bureaucratic delays and simplify procedures for obtaining licenses, permits, and approvals. Presently too much discretion is vested in the EDB rendering it a crooked and indolent entity.

9. Public-private partnerships need to be encouraged for collaboration between government, industry, and academia to develop new technologies, products, and services. The EDB should promote research and development (R&D) to boost industry-academia collaboration to diversify the products, and services.

### **Industry Level:**

10. Participation of industry should be ensured in policy making and all major players including the auto parts manufacturers and informal industry should also be made part of the deliberations and process being major stakeholders.

11. Karachi has been the major hub of automotive industry. However, with the passage of time, the industry also laid its foothold in Lahore. Currently, Lahore auto parts cluster is the second largest hub for auto parts manufacturing after Karachi and caters to almost fifty percent of auto parts demands of assemblers and after-markets.

Karachi: Hub Chowki, Port Qasim, Landhi, Korangi, Industrial Area

Lahore: Badami Bagh, McLeod Road, Bilal Ganj, Kot Lakhpat, Thokar Niaz

Baig



**Major Products - Metal Auto Parts**

1	Adapter Plate	41	Engine Valve Guides	81	Pitman Arms
2	Alex /Ball	42	Exhaust Manifolds	82	Pulley
3	Aluminium Radiators	43	Exhaust Muffler	83	Race End
4	Armrest	44	Fenders	84	Radiator Cores
5	Ash Tray	45	Floor Member	85	Rocker Levers
6	Automobile Horns	46	Fly Wheels	86	Rod Connecting
7	Axle Arm	47	Front & Middle Cowl	87	Rod Shifter
8	Backstay	48	Front & Rear Hub	88	Screw Jack Assy
9	Ball Joints	49	Front Fork	89	Service Valves Meter Body
10	Battery Retainer	50	Front Frames	90	Shackle Plates
11	Bearing Cup	51	Fuel Filters	91	Shaft Rear Axle
12	Bolts	52	Fuel Gauges	92	Shafts
13	Bracket Tail Light Case	53	Fuel Tank Assy	93	Shock Absorbers & Strut
14	Bracket Transmissions	54	Fuel Tank	94	Side gate panels
15	Brake Cam Lever	55	Fuel Tanks	95	Splined Shaft and Helical
16	Brake Drums	56	Gaskets	96	split pins
17	Brake Shoe	57	Gear Shifter Drum	97	Springs
18	Cam Chain	58	Gears	98	Steel Wire Springs
19	Cam Shafts	59	Hanger Spare	99	Steering Box
20	Carburetor	60	Helping Rod Bush	100	Steering Gear Box for Tractors
21	Cargo Bodies	61	Hub Crank	101	Steering Knuckle
22	Centrifugally Cast Cylinder Liner	62	Hub Idler Gear	102	Steering Rocker Shafts
23	Chain Case	63	HVAC Parts	103	Stem Nuts
24	Clevis Hydraulic	64	Hydraulic Lift Arms	104	Step Bar
25	Clutch facing	65	Kick Spindle	105	Straight Bevel Gear
26	Clutch Pedals	66	Leaf Springs Assy	106	Tappet Covers
27	Clutch/ Brake Pedals	67	Lever Parking Brakes	107	Thrust Washers

28	CNG Kits	68	Limiter Pipe	108	Tie Rod Ends
29	Crankcase Covers	69	LPG Regulators	109	Timing Gears
30	Cross Members	70	Member Fronts	110	Tool Kit
31	Crown Wheel & Pinion	71	Motor Cycle Handles	111	Tractor Wheels
32	Cylinder Body	72	Motor Cycle Rims	112	Transmission Kits
33	Disc Front Brake	73	Muffler	113	Tube Assy Exhaust
34	Dish Drums	74	Nipple & Spoke	114	Turn Signal Assy
35	Door Hinges	75	Oil Filters	115	U-Bolts
36	Drum Rear Brake	76	Oil Pump	116	Washer Assy
37	Engine Bearings	77	Oil Pump Gear	117	Wheel Chain
38	Engine Blocks	78	Oil Sump	118	Wheel Hub
39	Engine Bushes	79	Pillar	119	Wheel Rims
40	Engine Mounts	80	Pistons	120	Yoke Assy

### Major Products - Rubber/Plastic Auto Parts

1	Axle Boot	24	Head Light Case
2	Bumpers	25	High Pressure Fuel Injection Pipes
3	Oil Seals	26	Indicator Case
4	Starting Ring Gears	27	Insert & Sleeves
5	Air Filter	28	Mirror case
6	Battery Covers	29	Mounting Exhaust Pipe
7	bonnet seals	30	Mudguard
8	Brake & Fuel Pipes	31	O Bush
9	Brake Linings	32	O-Rings
10	Dash Board Insulators	33	Penal Cowl Top
11	Door Stopper	34	Radiant Hose
12	Door Trim	35	Roof Lining
13	Fan Shrouds	36	Rubber Hoses
14	Flaps for passenger cars	37	Shock Boot
15	Flexible Coupling	38	Speedometer Case
16	Floor Carpets	39	Spring Shackle Bush
17	Floor Mat	40	Strut Bar Bush
18	Footrest	41	Strut Bar Rubber
19	Fuel Injection Pipes	42	Suspension Bush
20	Fuel Sending End Units	43	Tool Box

21	Grill Assy	44	Tyres & Tubes
22	Grip Assist	45	Weather Strips
23	Handle Grip	46	Wheel Cap

### Major Products - Electronic/Electrical Parts

1	ACG (Magneto )	19	Heater Blowers Wiring Harness
2	Adaptor	20	Ignition Coil
3	Android based car security	21	Instrument Panel
4	Anti - Theft System	22	Key Sets (Locks)
5	Auto Wire	23	Lamps
6	Automotive Batteries	24	LEDs
7	Automotive Radios	25	Light switch
8	Automotive Speedometers	26	MIB
9	Bluetooth car door locking	27	Plug Cap
10	Cable & Channels	28	Potentiometer
11	Capacitor Discharge Ignition (CDI)	29	Regulator Rectifier
12	Car Audio System	30	RFID based car alarm system
13	Control Cable	31	Side Turn Lights
14	Control Wirers	32	Starter Motor & Alternators
15	GPS Self-Monitoring System	33	Switch Assembly Winker
16	Head Light Holders	34	Tachometers
17	Head Lights	35	Winker Flasher
18	Heat Light Assembly	36	Wire Harness

Integration of formal and informal auto and auto part manufacturing sector should be done as almost every metal, rubber and electrical part of the vehicle is being manufactured but since there is no standardization and integration of these with main industry, a lot of exploitation is being done by major assemblers. 1,325 out of 2,200 auto parts manufacturers are informal and unorganized and are just catering for merely after-market suppliers.

12. New technology needs to be introduced in manufacturing and assembling sector as even our major manufacturers are still relying on decades old technologies resulting in cost in-efficient products.

Inept engineering practices being adopted by unorganized and informal auto sector, are not only compromising the quality of products but also are not cost effective. It is due to this very fact, our auto as well as auto spares industry is unable to compete internationally.

13. The Government should invest in training programs and technical education to enhance workers' skills and familiarity with modern systems like CAD/CAM. Furthermore, On Job trainings to existing skilled labor on new and emerging technologies is also very necessary.

14. Pakistan's automobile industry has imported CKD kits worth US\$ 4309 million during the last 4 years which is in addition to an amount of the equal tune spent on import of CBUs though no explicit data was available for it.

Fiscal Year	Import Bill (USD Million)
2020-2021	1,110.0
2021-2022	1,670.0
2022-2023	750.0
2023-2024	779.0
<b>Total :</b>	<b>4,309.0</b>

These thriving CKD imports by the local assemblers were due to the low localization of parts in locally assembled vehicles, especially being rolled out by the new entrants under incentive packages offered under the AIDEP 2026-2021. Besides, the new models of old players also carry low volumes of locally made parts, thus nullifying assemblers' tall claims of achieving the highest-ever localization. It is therefore proposed to impose an immediate ban on import of those items that are being produced locally, on the Malaysian model. This would also compel the assemblers to collaborate with local industry to work on the quality of the manufactured auto parts.

### **Out of Box Recommendations:**

15. Pakistan Steel Mills Corporation (PSMC), which was envisioned as a cornerstone of Pakistan's industrial development, spreads over a vast area of approximately 18,660 acres (75.5 square kilometers) with an original design capacity of producing 1.1 million tons of steel per annum. Presently, the PSMC is almost 'inoperative' but it has the potential to play a crucial role in the development of Pakistan's industrial sector, particularly the automotive industry.

It has the capacity to produce a range of steel products including billets, slabs, hot rolled coils, cold rolled coils, galvanized sheets, and other steel products. PSMC can be made operational through a public private partnership alongside alignment of some interested auto manufacturer(s) to use its production in auto parts and machinery manufacturing. This would provide a complete solution to the industry under one roof while at the same time operationalizing a sick industrial unit and converting it into a Special Industrial Zone.

It would have significant positive impacts on the domestic steel market, reducing reliance on imports and supporting the growth of downstream industries. Local Steel industry also needs to be incentivized in terms of tax exemptions and subsidies to encourage establishment of new steel plants to produce auto grade steel. Similarly, there are large reserves of aluminum in the country. Investors may be incentivized to establish industry to produce aluminum sheets locally.

16. All out efforts shall be made to introduce and develop National Brands of “Make in Pakistan” and “Made in Pakistan”.

17. The CNC machines at PITAC, PCSIR, NTB and others may be made accessible to OEPs (Original Equipment Producers) so that they have access to modern and sophisticated technology which is lying poorly utilized.

18. Auto Industry Development Committee which is the main body chaired by Minister Industries and Production has no representation from OEPs (Original Equipment Producers) especially the unorganized/informal more than 1300 units which are the most underprivileged. Their representatives from all clusters (3 from each, total not less than 20) be made in the committee to protect their rights and integrate them in policy making and execution thereby enabling this community to reap the benefits of the policy.

19. Special Economic Zones may be established for Auto Sector preferably in the vicinity of existing clusters and be provided special incentives and complete ecosystem of auto industry.

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## Critical Evaluation of Labour related Policies, Regulations, Practices and Welfare Activities in the context of Industrial Development and Social Protection in Pakistan

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### Abstract:

This policy paper critically examines labour-related policies, regulations, practices, and welfare activities in Pakistan, focusing on their impact on industrial development and social protection. While Pakistan's legal framework provides a foundation for safeguarding labour rights, enforcement challenges, inclusivity, and alignment with international standards remain significant. The devolution of labour matters under the 18th Amendment has fragmented provincial laws, exacerbating disparities in governance, enforcement, and coverage. Key issues include institutional weaknesses, limited social protection for informal sector workers, gender disparities, and the prevalence of bonded and child labour. The paper utilizes the Blavatnik School of Government's Oxford Index of Public Administration Framework to identify gaps and draws comparative insights from global approaches, including Malaysia, India, Brazil, and the UK. It suggests actionable solutions, such as a unified national labour policy, law alignment, and strengthening institutional capacity to address systemic deficiencies and promote equitable industrial growth.

**Key words:** Labour policies, Industrial development, Social protection, Governance and enforcement, International Labour Organization (ILO) standards

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## *Introduction*

Labour rights and industrial development are pivotal for the socio-economic progress of nations, serving as key indicators of equity and justice in society. Pakistan's Constitution provides a robust legal framework to safeguard labour rights, enshrined in Articles 11, 17, 18, 25, 37(c), 37(e), 38(b), 38(c), and 38(d). These provisions prohibit forced labour and child labour, guarantee freedom of association, promote gender equality, and ensure just and humane working conditions (Pakistan, 1973). However, despite these protections, challenges persist in implementing effective labour-related policies, regulations, and welfare programs.

Pakistan's legislative framework encompasses several critical statutes designed to protect workers' rights. The Industrial Relations Act, 2012, governs the formation of trade unions and outlines collective bargaining processes, ensuring workers can negotiate terms of employment collectively. The Minimum Wages Ordinance, 1961, establishes minimum wage standards to ensure fair compensation for workers; as of 2024, the proposed minimum wage is PKR 37,000 per month (Punjab, 2024). The Payment of Wages Act, 1936, ensures timely and full payment of wages to employees, preventing unauthorized deductions. The Factories Act, 1934, prescribes health and safety standards in workplaces, regulating working hours, sanitation, and safety measures to protect workers. The Employees' Old-Age Benefits Act, 1976, provides pensions and other benefits to retired workers, ensuring post-retirement financial security. The West Pakistan Maternity Benefit Ordinance, 1958, grants maternity leave and benefits to female workers, promoting gender equality in the workplace. Additionally, the Bonded Labour System (Abolition) Act, 1992, explicitly outlaws bonded labour, aligning with constitutional mandates against forced labour.

Following the 18th Constitutional Amendment, labour matters were devolved to the provinces, leading to province-specific policies. The cited constitutional amendment, caused devolution of subjects to the provinces, including entry No.26 of the Concurrent List, which related to the welfare of labour, condition of labour, provident fund, employer liability, works men compensation and health insurance including old age pensions.

Pakistan has ratified 36 International Labour Organization (ILO) conventions, including eight fundamental conventions. Notable among these are Convention No. 87 (Freedom of Association and Protection of the Right to Organize), which protects workers' rights to form and join trade unions, and Convention No. 98 (Right to Organize and Collective Bargaining), which ensures the right to collective bargaining. Convention No. 29 (Forced Labour Convention) and Convention No. 105 (Abolition of



Forced Labour) commit to eliminating all forms of forced labour.

Additionally, Convention No. 138 (Minimum Age Convention) and Convention No. 182 (Worst Forms of Child Labour Convention) aim to eradicate child labour, particularly in hazardous conditions. Out of 36 conventions only 30 of these conventions are actively implemented in Pakistan, whereas the remaining 6 have been abrogated. Additionally, there are still 154 conventions that Pakistan has not yet ratified, highlighting a significant gap in the country's labour standards and commitments to international guidelines (Organization, n.d.).

The labour ecosystem in Pakistan encompasses a diverse range of stakeholders. The Federal and Provincial Governments hold the responsibility of legislating and enforcing labour laws, conducting inspections, and ensuring compliance with established regulations. Labour unions play a crucial role in advocating for workers' rights, participating in collective bargaining, and striving to enhance working conditions. The Employers' Federation of Pakistan represents the interests of employers, promoting equitable labour practices and compliance with legal standards. International organizations, such as the International Labour Organization (ILO), offer guidance, establish international labour standards, and assist in policy formulation. Additionally, institutions like the Employees' Old-Age Benefits Institution (EOBI) manage pensions and old-age benefits for eligible workers, while Provincial Workers Welfare Boards (PWWBs) and Employees Social Security Institution (ESSI) implement welfare initiatives that encompass housing, education, and healthcare for the workforce.

Despite comprehensive legal frameworks, several challenges persist. Approximately **72%** of the labour force is employed in the informal sector, lacking formal social protections (Pakistan Lawyer, 2024). An estimated **3.3 million** children are engaged in labour (UNICEF, n.d.). Female labour force participation remains low, with only **21.5%** participation, highlighting significant gender disparities (Lawyer, 2024). Weak enforcement mechanisms lead to violations of labour laws, with many workers not receiving minimum wages or working under unsafe conditions (SideKick, 2024).

### ***Problem Statement***

It is a fact that labour rights and welfare mechanisms are critical to achieving sustainable industrial development and ensuring social protection for workers in Pakistan. Despite the presence of labour-related policies, regulations, welfare institutions (Worker's Welfare Fund and Boards) and labour laws under provincial jurisdiction, gaps in implementation, enforcement, and inclusivity persist. However, the implementation of labour-related policies and welfare programs in Pakistan faces numerous challenges. Therefore, there is a pressing need to critically evaluate the effectiveness of existing laws, policies, regulations, practices, and welfare

initiatives.

This study seeks to address the underlying issues limiting their impact, identify gaps in governance and service delivery, and propose actionable solutions to enhance the welfare and protection of the labour force while fostering equitable industrial development.

### *Scope*

This study critically evaluates Pakistan's labour-related laws, policies, regulations, practices, and welfare activities, identifying systemic gaps and deviation from International Labour Standards, with focus on the role of Workers Welfare Fund at Federal level and Workers Welfare Boards at provincial level. This study aims to identify the issues related to legal framework and implementation with a view to propose amendment of laws / policies / regulations and actionable reforms in consonance with International Labour Standards, to ensure social protection, and uphold economic justice for its workforce.

### *Research Methodology*

This study employs a comprehensive and multi-faceted research methodology to critically evaluate labour-related policies, regulations, practices, and welfare activities in the context of industrial development and social protection in Pakistan. The approach integrates secondary data collection and a suite of analytical tools to provide a robust assessment.

The secondary data (qualitative method) has been obtained from the following sources:

- i. Official websites of relevant government departments and agencies.
- ii. Published reports from national and international organizations.
- iii. News articles and credible online publications.
- iv. Websites of international organizations such as the International Labour Organization (ILO), Human Rights Watch, and United Nations.

The study applies the following analytical tools to comprehensively assess the subject matter:

- i. Situational Analysis
- ii. Legal Analysis
- iii. Stakeholder and Institutional Analysis
- iv. SWOT-EETH Analysis
- v. GAP Analysis

The research incorporates the **Oxford Index of Public Administration Framework** developed by the Blavatnik School of Government. This framework is utilized to assess the governance, public administration, and service delivery mechanisms of the Workers' Welfare Fund (WWF) and Workers Welfare Boards. It provides a structured lens to evaluate institutional effectiveness, accountability, transparency, and responsiveness to stakeholders' needs.

## *Analysis*

### *Situational Analysis*

Labour welfare in Pakistan operates within a dual framework comprising federal and provincial systems. The Workers Welfare Fund (WWF) at the federal level and various provincial Workers Welfare Boards are tasked with ensuring social protection for labours. Despite legal frameworks and Pakistan's commitment to international labour standards, significant gaps in enforcement, coverage, and inclusivity persist. This situational analysis examines the capacity, preparedness, and performance of these institutions, integrating real-life practices, international conventions, and statistical insights.

In order to incorporate stance of the key stakeholders in this study, efforts were made to establish contact with few randomly selected employers/industrialists. It was noted with concern that the reluctance displayed by the employers/industrialists in sharing factual stance could have some underlying reasons, which may also include the industrialists being hand-in-glove with the Government institutions to violate the laws, rules and regulations. As far as the labours are concerned, their side of the story has been narrated in clear words by multiple private organizations and has been duly incorporated in this study at later stages of the Situational Analysis.

To gain insight into the current situation, a visit was made to the Khyber Pakhtunkhwa Employees Social Security Institute. Although the limited availability of documented and verifiable data prevented its complete incorporation into this study, an astonishing fact emerged during the visit. While looking for winks and twitches, it turned out that the very department responsible for ensuring social security for the public is paying its own Security Personnel a meager monthly salary of PKR 21,000 per person.

### *Informal vs. Formal Labour*

Pakistan's labour market is predominantly informal, creating challenges in extending comprehensive social protections.

The **Informal Sector** constitutes 72.5% of non-agricultural jobs, with rural areas exhibiting higher informal employment (76.2%) compared to urban areas (68.5%). Women disproportionately occupy informal roles, particularly in home-based and low-wage jobs, reflecting systemic gender inequities. Whereas, the **formal Sector** represents only 27.5% of the workforce. Workers in this sector benefit from limited social protections, such as pensions (8%) and medical support (9%), though these benefits remain inaccessible to most labours (Statistics, 2022).

### *Sectoral Employment Distribution*

With regards to the **Sectoral Employment Distribution**, **Agriculture** employs 38% of the labour force, predominantly informal. Women constitute a significant proportion (67.9%) of rural agricultural workers but lack formal protections due to agriculture's exclusion from labour laws. **Industry and Services** sectors employ 62% of the workforce and are critical to economic growth. However, informal employment dominates, limiting the reach of labour protections (Statistics, 2022).

### *Labour Unions*

Article 17 of the **Constitution of Pakistan** enshrines the right to association as a fundamental freedom; however, this right remains largely ineffective in practice. Current statistics indicate that a meager 1-3% of the labour force is unionized, a figure based on recent ILO mappings that document around 1.4 million workers participating in 7,096 unions. The road to successful unionization faces numerous obstacles, particularly in industrial sectors that have been exempt from the Industrial Relations Act since 1969. Legal and bureaucratic complexities hinder the formation of unions, especially when employers actively resist such movements, often establishing 'pocket unions' aimed at undermining authentic representation (Fund, n.d.).

The situation is further complicated by legal exclusions; as certain industrial sectors remain outside the purview of laws that facilitate unionization. The intricate legal requirements present significant barriers for establishing unions, even within sectors that could otherwise benefit from collective representation. Furthermore, employers' practices often involve the active suppression of legitimate unionization efforts, as many industrialists comply only superficially with the demands of global buyers, failing to genuinely promote the rights of workers. Union structures themselves face significant weaknesses; they tend to be concentrated in limited industrial pockets and within public sectors, while the burgeoning service sector is largely neglected. Contractual employees frequently find themselves excluded from union activities, and unions have struggled to modernize and adapt to contemporary workplace dynamics. Additionally, the representation of

women and young workers within unions remains inadequate, with a noticeable absence of female leadership (Fund, n.d.).

The struggle for labour rights in Pakistan is also deeply intertwined with political dynamics, where a considerable imbalance of power exists. Corporations often wield significant influence, prioritizing profit over the welfare of workers. The weak enforcement mechanisms of the state further aggravate the vulnerability of workers, allowing exploitation to thrive. Despite an uptick in female participation in the labour market, women face considerable barriers to union membership and leadership positions. The trade union leadership landscape is largely dominated by individuals rooted in the 1970s, with a concerning lack of initiatives aimed at engaging and nurturing the next generation of leaders. The ramifications of low unionization rates are profound: they result in significantly weakened bargaining power for workers, absence of adequate representation in policymaking processes, and fragmentation among the limited number of existing unions, which are often split along political, ethnic, and religious lines. This convergence of factors undermines the collective strength needed to advocate for better labour conditions and rights in Pakistan (Stiftung, 2022).

### *Violations*

Human Rights Watch research indicates rampant labour violations, such as forced overtime, denial of maternity leave, unjust terminations, and below-minimum wages. Women and children, particularly in smaller factories, are especially vulnerable. Many women work as home-based labours under exploitative conditions with little pay and no job security. The research also states that the garment industry in Pakistan employs millions of workers but is marked by significant labour abuses, including exploitation, poor working conditions, and violations of labour laws. Notable incidents like the 2017 Khaadi protests and the 2012 Ali Enterprises factory fire have highlighted these issues. The Khaadi protests began when 32 workers were fired for asserting their legal rights, citing unsanitary conditions, excessive hours, and inadequate wages. Meanwhile, the factory fire, which killed at least 255 workers, revealed serious safety compliance failures (Watch, n.d.).

Pakistan has made progress in labour rights by ratifying several International Labour Organization (ILO) Conventions, including all eight fundamental conventions aimed at protecting workers' rights. Notably, the Forced Labour Conventions (No. 29 and 105) work to eradicate forced labour, emphasizing freedom and dignity for all. The country also recognizes the importance of Freedom of Association and Collective Bargaining through Conventions No. 87 and 98, enabling workers to form unions and negotiate for better conditions. Additionally, Pakistan is committed to Equal Remuneration (Convention No. 100) and combating workplace discrimination (Convention No. 111).

The ratification of the Minimum Age Convention (No. 138) and the Worst Forms of Child Labour Convention (No. 182) highlights its resolve to protect children from labour exploitation (Organization, n.d.). Despite these achievements, the persistence of above referred instances of labour abuse coupled with bonded labour undermines the principles of the cited conventions. It is of pertinence to note that ratification of ILO Conventions seems to be only compliant on paper with minimum real-life impact. The prevalence of bonded labour can be ascertained from the fact that an estimated over three million individuals are trapped in conditions akin to slavery. According to the Global Slavery Index, Pakistan ranks among the top six countries notorious for such labour bondage. Informal workers face limitations in accessing trade union rights, hindering their ability to advocate for improved working conditions and fair wages, which contributes to ongoing exploitation (Center, 2020).

### ***International Labour Organization's Decent Work Country Program (Pakistan)***

The **Decent Work Country Programme (DWCP)** for Pakistan (2023–2027), developed by the International Labour Organization (ILO), is a strategic framework aimed at addressing the country's labour market challenges and promoting sustainable development. It has been designed in collaboration with tripartite partners, including the Ministry of Overseas Pakistanis and Human Resource Development, employer and worker organizations, and provincial stakeholders. The program's overarching goal is to enhance access to decent and productive work for all men and women in Pakistan while addressing systemic issues in the labour market.

The DWCP focuses on four key priorities to achieve its goals. First, it seeks to integrate decent work into Pakistan's economic recovery and development policies. This includes formulating job-rich, equitable, and environmentally sustainable economic strategies that are gender- and disability-responsive. Second, the program emphasizes the importance of developing universal social protection frameworks, aligning with international labour standards to extend coverage to vulnerable populations. Third, it aims to strengthen labour standards and rights by fostering harmonious industrial relations and addressing issues such as non-payment of wages, excessive working hours, and workplace discrimination. The DWCP prioritizes ensuring safe and inclusive workplaces by improving occupational safety and health (OSH) measures and promoting environments free from violence and harassment.

The DWCP responds to significant challenges in Pakistan's labour market. Over 72% of the workforce operates in the informal economy, characterized by poor working conditions and limited access to social protections. Social protection coverage remains alarmingly low, with only 9.2% of the population covered.

Gender inequality is another pressing issue, with women's labour force participation at just 21.4% compared to 67.9% for men, and a substantial gender pay gap. Child labour affects 8.23% of children aged 10–14, while more than 3 million people are trapped in forced labour.

Furthermore, occupational safety remains a critical concern, as 2.7% of worker's experience accidents annually, and nearly one-third of youth are disengaged from education, employment, or training.

By 2027, the DWCP envisions several transformative outcomes. These include inclusive economic growth driven by broad-based and green policies, expanded social protection coverage through strengthened frameworks, enhanced access to fundamental labour rights, and safer workplaces characterized by improved OSH measures and harassment-free environments. Gender equality and inclusivity remain central to these efforts, ensuring that no one is left behind.

Aligned with Pakistan Vision 2025, the United Nations Sustainable Development Cooperation Framework (2023–2027), and the Sustainable Development Goals (SDGs), the DWCP contributes to both national and global frameworks. It also reflects ILO's global commitments, including the Centenary Declaration and the Global Call for a Human - Centered Recovery from COVID-19. The programme's cross-cutting themes include gender equality, social dialogue, and tripartism, emphasizing collaborative efforts to achieve sustainable socio-economic development.

### ***Capacity, Preparedness and Performance of Workers' Welfare Fund Boards***

The above cited circumstances demand a thorough evaluation of the Workers' Welfare Fund and the provincial Workers' Welfare Boards to assess their capacity, preparedness, and effectiveness in upholding and protecting workers' rights in Pakistan. Labour welfare in Pakistan operates within a dual framework comprising federal and provincial systems. The Workers Welfare Fund (WWF) at the federal level and various Provincial Workers Welfare Fund Boards (PWWBs) are tasked with ensuring social protection for labours.

The WWF was established under the Workers Welfare Fund Ordinance, 1971, to provide housing, education, and welfare services for industrial workers. It operates under a tripartite Governing Body representing federal and provincial governments, employers, and workers. Financial resources are derived from employer contributions and investment income (WWF, n.d.). While the financial resources of WWF have grown significantly from Rs. 14 billion in 2021-2022 to Rs. 50 billion in 2022-2023, the WWF's ability to address the needs of informal workers, who constitute 72.5% of the labour market, remains severely limited.

The existing legal framework restricts benefits to formal sector workers, leaving a vast majority of labourers without access to critical social protections.

The WWF has made strides in addressing backlogs related to marriage and death grants, scholarships, and financial aid. New welfare initiatives, such as the provision of ambulances and community centres, indicate some level of innovation and responsiveness (Department, 2023). However, these measures primarily benefit formal sector workers.

The lack of outreach programs to informal labour, particularly women and rural workers, highlights a significant shortfall in performance. Furthermore, the fund's governance structure, while inclusive on paper, lacks mechanisms to ensure accountability and transparency in its operations.

Provincial Workers Welfare Boards (PWWBs) are mandated to implement welfare measures such as housing, education, and training for workers and their families. These boards operate under provincial governments but face significant resource and capacity constraints. For instance, the Khyber Pakhtunkhwa Workers Welfare Board has invested in housing projects, such as the inauguration of 2,056 residential flats in 2021 (KP, n.d.). However, the ability of PWWBs to cater to the informal sector, including agricultural and home-based workers, remains minimum. The performance of PWWBs varies widely across provinces. In Punjab and Sindh, the boards have initiated housing and educational projects, but implementation gaps persist due to bureaucratic inefficiencies and inadequate funding. Rural areas, where informal employment is dominant (76.2%), receive limited attention, and the boards' focus remain skewed toward industrial pockets. Furthermore, the exclusion of contractual and home-based workers undermines the inclusivity of provincial welfare programs.

### ***Micro Level Analysis***

While macro-level analysis of labour-related laws, rules and policies are undeniably significant, it is at the micro level that the true impact of their failures becomes most evident. Individual occurrences or accidents, often lost to the public's memory, paint a vivid picture of the consequences of inadequate laws, policies, and governance. These incidents, though fleeting in public discourse, leave a permanent mark on the lives of those directly affected, while Pakistan as a whole bears the loss in terms of human capital and workforce through casualties and injuries, often leaving victims paralyzed for life. Such events not only devastate individuals and families but also hinder the country's socioeconomic progress. Therefore, it is imperative to conduct a micro-level analysis encompassing major industrial sectors and provinces to present a clear and comprehensive picture of the systemic gaps and their widespread implications.



Tabulated below are the micro-level analysis of the accidents across various industries in Pakistan, which present a gloomy state of affairs of the country's governance failure in the realm of labour related laws, rules, policies and practices:

City & Industry	Year	Brief of Incident	Detailed Violation of Labour Laws	Casualties	Reference
Lahore (Sundar Industrial Estate)	2015	Factory collapsed, trapping workers inside.	Poor construction quality and absence of labour safety inspections. <b>Failure to enforce the Factories Act, 1934.</b>	45	(BBC, 2015)
Quetta (Coal Mine Collapse)	2023	Methane gas explosion caused mine collapse.	Absence of proper ventilation, lack of monitoring equipment. <b>Failure to enforce the Mines Act, 1923.</b>	11	(AlJazeera, 2023)
Karachi (Ali Enterprises Factory)	2012	A devastating fire broke out in the garment factory due to inadequate safety measures, including locked exit doors and barred windows, trapping workers inside.	<b>Failure to enforce the Factories Act, 1934.</b>	258	(Watch, 2019)
Sialkot (Sportswear Factory)	2016	Child labourers found working in hazardous conditions, violating child labour laws.	Failure to prohibiting child labour in hazardous occupations. <b>Failure to enforce Employment of Children Act, 1991.</b>	Several child workers rescued	(Dawn, 2016)

**Brick Maker's Case Scenario:** The brickmaking industry in Pakistan serves as a grim testament to the pervasiveness of bonded labour and the exploitation of marginalized communities. Employing over 3 million individuals, including men, women, and children, the sector remains steeped in systemic human rights abuses despite legislative efforts to combat bonded labour. Workers are often trapped in debt bondage, a form of modern-day slavery, where they are forced to work under exploitative conditions to repay loans taken from kiln owners. This practice is facilitated by the absence of formal contracts and the lack of effective enforcement of labour laws.

Families working in brick kilns live in deplorable conditions, residing in makeshift huts devoid of basic amenities such as clean water, sanitation, and healthcare. The hazardous working environment, characterized by toxic air and unsafe practices, poses severe health risks, contributing to high mortality rates among children and low life expectancy among adults. Poverty, illiteracy, and socio-economic vulnerability perpetuate cycles of generational bondage, often exacerbated by discriminatory practices against religious minorities, such as Christians and Dalits, who form a disproportionate segment of the kiln workforce.

The testimony of Sara (name changed for identity protection) underscores the extreme physical, psychological, and sexual abuse endured by workers, particularly women. Following the death of her husband, Sara faced relentless exploitation, including verbal and physical abuse, sexual violence, and threats to her life and her children's safety. Her story highlights the inability of existing mechanisms to provide justice or protection for the victims of such systemic exploitation.

Despite the existence of legislation, including the Bonded Labour System (Abolition) Act 1992, Factories Act 1934, and the Industrial Relations Act, the enforcement of these laws remains weak. International obligations under various International Labour Organization (ILO) conventions, such as the Forced Labour Convention (No. 29) and the Abolition of Forced Labour Convention (No. 105), have yet to translate into substantive change at the grassroots level. Activists like Syeda Ghulam Fatima and faith-based organizations are at the forefront of combating these injustices, but their efforts are often met with violent resistance (Wilberforce, 2024).

The above cited scenario identifies following issues:

- i. **Bonded Labour and Debt Bondage** - Over 90% of brick kiln workers are trapped in debt bondage, violating the Bonded Labour System (Abolition) Act 1992 and ILO conventions. Workers are forced to labour under exploitative terms without clear contracts, perpetuating a cycle of poverty and slavery.
- ii. **Inadequate Enforcement of Labour Laws** - Laws such as the Factories Act 1934 and the Industrial Relations Act, which outline safety, welfare, and labour rights, are poorly enforced due to corruption, lack of capacity, and cultural acceptance of bonded labour.
- iii. **Discrimination and Vulnerability of Marginalized Groups** - Religious minorities and lower-caste groups are disproportionately affected. Discriminatory practices and lack of protections exacerbate their vulnerability to exploitation and abuse.
- iv. **Gender-Based Violence and Exploitation** - Women in brick kilns face widespread sexual harassment, violence, and exploitation. Cases of rape and abuse, as highlighted in Sara's testimony, remain underreported due to fear of retaliation and social stigma.

- v. **Generational Slavery** – Debts are inherited, trapping families in intergenerational cycles of bondage. This practice violates the principles of human dignity and equality enshrined in the Constitution of Pakistan and international human rights standards.
- vi. **Lack of Access to Basic Services** – Brick kiln workers lack access to essential services such as healthcare, education, clean water, and sanitation, further entrenching their socio-economic deprivation.
- vii. **Non-Compliance with International Commitments** – Pakistan’s ratification of ILO conventions on forced labour and child labour has not resulted in meaningful reforms or compliance at the national level. The gap between international commitments and domestic practices undermines global labour standards.
- viii. **Corruption and Impunity** – Corruption within law enforcement and the judiciary prevents victims from seeking justice. Perpetrators often act with impunity, knowing that legal mechanisms are ineffective.
- ix. **Lack of Awareness and Advocacy** – Workers are often unaware of their rights under existing laws, and there is insufficient advocacy to address the root causes of bonded labour and promote alternative livelihoods.
- x. **Health Hazards and Unsafe Working Conditions** – Workers are exposed to toxic environments and unsafe practices, leading to long-term health issues and premature deaths. This contravenes provisions under the Factories Act 1934 concerning occupational safety and health.

**Labour Rights Violation in the Textile Industry of Pakistan** – A report of titled “No Contracts, No Rights: How the Fashion Industry Avoids Paying Minimum Wages in Pakistan” by European Center for Constitutional and Human Rights (Rights, n.d.) is of relevance with regards to the micro level analysis on the subject issue. In-depth study of the cited report revealed the following findings:

- i. **Lack of Written Contracts and Employment Security** - The study reveals that 97% of surveyed garment workers in Sindh province lacked written employment contracts. This absence of formal agreements results in precarious employment conditions, leaving workers vulnerable to arbitrary termination, exploitation, and non-payment of dues.
- ii. **Non-Payment of Minimum and Living Wages** – Approximately 28% of workers interviewed did not receive the legal minimum wage of PKR 25,000 per month, with 49% of those who were nominally paid the minimum wage reporting unpaid overtime. Additionally, many workers performing skilled labour were underpaid as they were not compensated according to their qualifications. This violation of wage laws persists despite Pakistan's regulations and is exacerbated by inflation and economic hardship.

- iii. **Exploitative Contracting Systems** – Factories frequently use third-party contractors, employing nearly 29% of workers. This system absolves factories of legal responsibility for wage compliance, social security contributions, and worker benefits. Workers hired under these arrangements face heightened insecurity, reduced bargaining power, and greater susceptibility to labour rights violations.
- iv. **Absence of Social Security and Benefits** – The majority of workers lack social security coverage (64%) and pension benefits (85%). In many cases, workers were unaware of their entitlements. These gaps in social protection highlight systemic governance deficiencies in enforcing labour welfare policies.
- v. **Governance Issues and Complicity**
  - a. **Ineffective Labour Inspections** – Labour inspection mechanisms in Pakistan are weak and often fail to monitor or penalize factories for non-compliance with labour laws. This ineffectiveness contributes to the widespread exploitation of workers.
  - b. **Suppression of Unionization** – Freedom of association is severely restricted. Factory owners employ tactics such as short-term contracts and intimidation to prevent unionization. Survey data indicates that 94% of workers who faced wage violations had no access to active unions. Union leaders and members often face threats, harassment, and violence, deterring collective action.
  - c. **Inadequate Corporate Accountability** – Despite the German human rights due diligence law (LkSG), which mandates global brands to ensure fair labour practices in their supply chains, no significant efforts have been made by international companies sourcing from Pakistan to address these violations. Brands have not adjusted pricing structures to enable fair wages and often overlook these issues in favor of cost-cutting.
  - d. **Economic and Social Context** – The garment industry, employing 15 million people, represents 38% of Pakistan's manufacturing workforce and contributes significantly to exports. However, inflation, rising fuel costs, and economic instability exacerbate workers' struggles. In 2023, the inflation rate reached 38%, significantly diminishing workers' purchasing power and pushing many into poverties.

### *Legal Analysis*

After the 18th Constitutional Amendment, the concurrent legislative list was abolished and resultantly the subjects enumerated in it were devolved to the provinces including entry No. 26, which was related to the welfare of labour, condition of labour, provident fund, employer liability, and works men compensation, health insurance, including invalidity pension, old age pensions. However, for the continuation of laws, it is provided in Clause-VI of Article-270 AA that all laws relating to any of the above matters enumerated in the said list which was enforced in Pakistan or any part thereof, before the commencement of the 18th amendment shall continue to remain enforced until altered, repealed or amended by the competent authority/forum. The Federal Government constituted the Implementation Commission as required under Clause (9) of Article 270 AA, which was mandated to complete the process of devolution of the matters, mentioned in the concurrent legislative list, to the provinces. The Implementation Commission decided that the matters mentioned in entry No. 26 of the concurrent legislative list may be devolved to the provinces, except the Employee Old Age Benefit Institution (EOBI) and Workers Welfare Fund (WWF) which may remain with the Federal Government.

#### *Factories Act 1934 and Provincial Factories Acts*

The Factories Act, 1934 is the foundational legislation for regulating industrial labour in Pakistan. Enacted during British colonial rule, it governs aspects such as worker safety, working conditions, and welfare. Following Pakistan's independence, the Act continued to operate at the national level. However, with the 18th Amendment to the Constitution in 2010, labour laws were devolved to the provinces, resulting in the enactment of the provincial Factory Acts i.e. Punjab Factories Act (2012), Sindh Factories Act (2015), Khyber Pakhtunkhwa Factories Act (2013) and Balochistan Factories Act (2021)

**Scope and Jurisdiction** – The Factories Act, 1934 initially applied to all industrial establishments in Pakistan, defining a factory as any premises with 10 or more workers. Post-devolution, each province has adapted the Act to address local labour conditions.

**Child Labour and Minimum Age** – Under the Factories Act, 1934, children under 14 years were prohibited from employment in factories. The ILO's Convention No. 138 sets the minimum working age at 15 years, with exceptions for developing countries, allowing 14 years for light work. Sindh Factories Act, 2015 raised the minimum working age to 15, aligning with international standards. However, other provinces (Punjab, KP and Balochistan) retained the 14-year threshold, permissible under ILO flexibility provisions. Thus, Sindh demonstrates full compliance with ILO standards, while other provinces align within permissible limits.

**Night Work for Young Persons** – The Factories Act, 1934 prohibited night work for individuals under 17 years. ILO's Convention No. 90 mandates a higher threshold, prohibiting night work for persons under 18 years. Provincial Acts generally maintain the original age limits from the 1934 Act, creating partial misalignment with ILO requirements. However, Sindh and Punjab have introduced stricter enforcement mechanisms for young workers employed during restricted hours. There remains a gap in full compliance with ILO standards regarding night work for young persons.

**Employment of Women and Night Work** – The Factories Act, 1934 restricted night work for women, barring them from employment during specified hours. ILO's Convention No. 89 prohibits night work for women, except under exceptional circumstances. Sindh and Punjab have introduced flexible regulations to accommodate modern industrial needs, such as allowing women to work night shifts in managerial or technical roles. These changes are designed to support gender inclusivity but deviate from strict adherence to ILO's convention. While progressive, provincial amendments partially conflict with ILO standards.

**Working Hours and Overtime** – The Factories Act, 1934 set working hours at 8 hours per day and 48 hours per week, with overtime capped at 12 additional hours. ILO's Convention No. 1 endorses these limits. Provincial Acts retained these provisions, with some, such as Punjab, enhancing compensation rates for overtime to encourage compliance. The provincial laws align well with ILO standards on working hours and overtime.

**Occupational Safety and Health** – The Factories Act, 1934 provided basic health and safety measures, including provisions for sanitation, drinking water, and ventilation. ILO's Convention No. 155 emphasizes comprehensive measures to ensure worker health and safety. Through Sindh Factories Act, 2015, the province of Sindh introduced detailed provisions for hazardous material handling, emergency preparedness, and accident reporting. Punjab and KP also modernized their safety protocols, ensuring greater compliance with ILO standards. Provincial Acts exhibit significant progress in occupational safety and health, reflecting alignment with ILO standards.

**Freedom of Association and Collective Bargaining** – The Factories Act, 1934 did not extensively address the right to form unions or engage in collective bargaining, relying instead on separate labour laws. ILO's Conventions No. 87 and 98 state the right to freedom of association and collective bargaining. Although, the federal and provincial legal instruments are indirectly aligned, but both laws need reinforcement to fully comply with ILO conventions.

**Environmental and Welfare Provisions** – The Factories Act, 1934 had limited focus on environmental protection and worker welfare facilities such as childcare and canteens. Provincial Acts, particularly in Sindh and Punjab, introduced advanced environmental and welfare requirements, including pollution control mechanisms and maternity leave. Modern provisions in provincial laws reflect growing alignment with international labour and environmental standards.

### *Federal and Provincial Industrial Relations Acts*

**Dispute Resolution Mechanisms** – Conciliators and arbitrators mediate disputes between employers and workers. If conciliation fails, cases are referred to labour courts. The Sindh and Balochistan Acts include specific provisions for expedited proceedings, while the Federal IRA has broader provisions but fewer specific timelines. The Acts provide for the establishment of labour courts to adjudicate disputes and enforce decisions. Appeals are heard by labour appellate tribunals. Punjab's IRA has detailed rules on tribunal formation and stand out as compared to other provincial laws.

**Workers' Participation in Management** – Laws in Khyber Pakhtunkhwa and Balochistan mandate workers' representation in management boards, promoting participatory governance within industrial establishments.

**Provisions for Strikes and Lockouts** – Workers may strike after serving notice and exhausting conciliation procedures and same in the case of lockouts. Strikes in "public utility services" are subject to additional restrictions. The Sindh IRA defines public utility services more comprehensively than other Acts. Actions conducted without following due process are deemed illegal and attract penalties. The Balochistan IRA includes more stringent penalties for illegal strikes and lockouts compared to the Federal law.

**Penalties for Non-Compliance** – Each act specifies penalties for unfair labour practices, such as discrimination against union members or failure to implement agreements. The Punjab IRA's penalty structure is more detailed, including higher fines for repeat violations.

**Gender Inclusivity** – There is a provision in IRA for participation of women in Trade Union yet it is seldom implemented. The Sindh IRA requires trade unions to include women in their executive bodies proportionate to their representation in the workforce. This progressive step is not mirrored in other provincial Acts or the Federal IRA, which could benefit from adopting similar provisions.

**Consonance with ILO** – As far as the consonance with the conventions of International Labour Organization is concerned, Pakistan's IRAs uphold freedom of association (Convention 87 – Freedom of Association), however, the bureaucratic hurdles restrict its implementation in true letter and spirit. Sindh IRA's broader inclusion of sectors such as agriculture and fishing better aligns with ILO standards. The Acts support collective bargaining processes (Convention 98 – Right to Organize and Collective Bargaining) but face challenges in practical enforcement due to difficult registration procedures and resistance from employers / industrialists.

### *Workers' Welfare Fund and Workers' Welfare Boards*

**Scope and Framework** – The Workers' Welfare Fund (WWF), established under the Workers' Welfare Fund Ordinance, 1971, operates as a federal initiative aimed at financing various welfare activities for industrial workers across Pakistan. It encompasses housing projects, scholarships, skill development programs, and financial grants. The WWF is financed through contributions from industrial establishments (2% of annual income above a specified threshold under Section 4(1) of WWF Ordinance, 1971) and leftover of 5% of profits after distribution among eligible workers under the Companies Profit (Workers Participation) Act, 1968. The collections are made by the Federal Board of Revenue and credited to the WWF Trust Account, which is maintained by Accountant General of Pakistan Revenues (AGPR). The administration of the fund involves a Governing Body composed of representatives from the federal and provincial governments, employers, and workers.

After the 18th Constitutional Amendment, labour welfare was devolved to the provinces, leading to the establishment of provincial Workers' Welfare Boards (WWBs) in Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan. These Boards are responsible for implementing the provisions of the WWF Ordinance or their respective provincial law, within their jurisdictions. Each board operates its initiatives, such as housing schemes, educational programs, and financial assistance, tailored to the specific needs of its province. The funding and administration rely on contributions from industrial establishments within the province and coordination with the Federal WWF.

**Governance and Administration** – The WWF's governance involves a centralized approach with the Governing Body overseeing operations at the Federal level. This body ensures uniform policies and guidelines for fund utilization, addressing broader national labour welfare priorities. It also facilitates contributions from industrial establishments operating across multiple provinces.



Provincial Boards operate autonomously under their respective labour departments. While they align with Federal guidelines, the decentralized framework allows provinces to prioritize welfare measures based on localized labour demographics. Governance structures include worker and employer representation, but effectiveness varies due to administrative capacity and resource allocation.

**Resource Allocation and Financial Sustainability** – The WWF is financed through a well-defined structure, including mandatory contributions, government funding, and investment income. Its centralized model allows for more extensive pooling of resources but often results in delayed disbursement of funds to provinces, creating bottlenecks in project implementation.

Provincial Boards rely heavily on Federal fund disbursements and contributions from local industries. However, disparities in industrial development among provinces lead to unequal resource generation. For instance, Punjab, with a robust industrial base, manages more extensive welfare initiatives than less industrialized regions like Balochistan.

**Program Implementation and Reach** – The Federal fund primarily addresses overarching welfare schemes but lacks direct implementation at the grassroots level. This often results in challenges in addressing local nuances and specific worker needs.

Provincial Boards are directly responsible for on-ground implementation, enabling them to address province-specific challenges. However, inefficiencies, limited administrative capacity, and lack of worker awareness hinder the equitable and effective distribution of benefits. Punjab, for instance, demonstrates relatively efficient governance and investment policies, while Sindh and Balochistan face administrative bottlenecks.

**Consonance with ILO Conventions** – Both the WWF and WWBs align with Pakistan's commitments under the 36 International Labour Organization (ILO) conventions, including the eight fundamental conventions. Key areas of alignment include:

- i. Social Security (ILO Convention No. 102) – Both the WWF and WWBs provide housing, education, and financial grants, contributing to minimum social security standards for workers.
- ii. Freedom of Association and Collective Bargaining (ILO Conventions No. 87 and 98) – The governance structures include worker and employer representation, fostering tripartite consultation and decision-making.
- iii. Gender Equality (ILO Conventions No. 100 and 111) – Welfare provisions such as scholarships and marriage grants indirectly promote gender equity, particularly benefiting workers' families.

- iv. Child Labour (ILO Conventions No. 138 and 182) – Education-focused schemes by both the WWF and WWBs contribute to reducing child labour by encouraging school enrollment among workers' children.
- v. Labour Inspection (ILO Convention No. 81) – Despite alignment in principle, weak labour inspection mechanisms remain a gap in ensuring compliance and effective implementation.

### *Mines Act, 1923*

**Federal** – The legislation governing the operations of mines in Pakistan is the Mines Act, originally enacted in 1923 by the British to regulate mining and the welfare of mine workers. It applies to all mineral-extracting operations, including coal, metal and oil. The legislation targets mine workers' safety, health and welfare and provides a comprehensive framework to prevent accidents and occupational diseases

Reports by the Human Rights Commission of Pakistan established that Pakistan coal mines, primarily located in Balochistan and Gilgit-Baltistan, are some of the most dangerous workplaces globally. Mine workers usually do not use the proper gear and enter the mines in their routine wear. This has resulted in hundreds of mine workers losing their lives in accidents that could have been averted if basic safety standards were in place. Pakistan is still not a signatory to the ILO Convention C176 on Safety and Health in Mines. This is reflected in the poor state of health and safety standards in the mines throughout the country (Pakistan H. R., n.d.).

**Provincial** – The Commissionerate of Mines in Khyber Pakhtunkhwa, under the **Khyber Pakhtunkhwa Excise Duty on Minerals (Labour Welfare) Act, 2021**, focuses on improving the welfare of mine labourers through health, education, and financial support. It has established 12 Mines Labour Welfare (MLW) Dispensaries to provide healthcare, particularly for occupational diseases, and offers scholarships for children of labourers, covering general, professional, and special education needs. Financial assistance includes death, disability, and marriage grants, along with stipends for trainees. A key achievement is the development of an online portal, enabling over 28,000 labourers to register and access welfare programs. While the initiative faces challenges such as low excise duty rates, delays in fund transfers, and limited infrastructure, it has significantly improved the quality of life for labourers and their families, fostering a safer and more equitable working environment in the mining sector.

## *Stakeholders and Institutional Analysis*

### *Workers/Employees*

**Role** – Labours form the backbone of industrial development, contributing significantly to Pakistan's economy across sectors such as agriculture, industry, and services. They are the direct beneficiaries of labour policies, welfare programs, and social protection mechanisms while driving industrial productivity. Workers seek fair wages, job security, and decent working conditions, along with access to pensions, healthcare, and housing benefits facilitated by institutions like the Employees Old-Age Benefits Institution (EOBI) and the Workers Welfare Fund (WWF).

**Influence** – Labours have limited influence due to low unionization rates, lack of awareness of labour rights, and inadequate representation in policy-making processes. Informal sector workers, who constitute over 72% of the workforce, are largely excluded from formal protections, further diminishing their collective bargaining power. However, their influence can become moderate when organized through unions or advocacy platforms.

**Impact** – Challenges faced by workers include low wages, unsafe working conditions, and lack of social protections, which perpetuate economic disparities. Vulnerable groups such as women, children, and informal workers are disproportionately affected. Informal employment and minimal bargaining power hinder their ability to assert their rights, limiting overall progress in industrial and social development.

### *Labour Unions*

**Role** – Labour unions advocate for workers' rights, negotiate collective bargaining agreements, and ensure compliance with labour laws. They play an advocacy role by addressing workplace grievances and improving working conditions. Unions also ensure that workers have a voice in policy discussions.

**Influence** – Despite their potential, unions have limited influence due to low unionization (1–3% of the workforce), fragmented structures, and lack of political support. Their influence varies depending on their strength and the sector they represent, with public-sector enterprises and large industries often witnessing stronger union activity. However, political interference, internal divisions, and employer resistance further weaken their position.

**Impact** – The limited reach and influence of labour unions result in a lack of effective representation for workers, contributing to weak enforcement of labour rights. This hinders progress toward equitable industrial relations.

### ***Employers/Industrialists***

**Role** – Employers drive industrial and economic growth by creating jobs and generating revenue. They are responsible for ensuring compliance with labour laws, providing safe working conditions, and contributing to welfare programs such as EOBI and WWF.

**Influence** – Employers wield significant influence, often shaping labour policies through lobbying and representation in tripartite forums. They aim to minimize costs, maintain profitability, and reduce regulatory burdens. Organizations like the Employers' Federation of Pakistan (EFP) enhance their collective lobbying power.

**Impact** – While employers contribute to economic development, their reluctance to fully adhere to labour standards aggravates issues such as low wages, unsafe conditions, and limited benefits for workers. Resistance to unionization and reluctance to formalize employees, particularly in Small and Medium Enterprises (SMEs), further restrict workers' ability to advocate for their rights.

### ***Ministry of Overseas Pakistanis & Human Resource Development (MOPHRD)***

**Role** – The Ministry oversees the WWF at the Federal level and is responsible for formulating and implementing labour policies, including those related to overseas workers. It represents Pakistan in international labour forums like the International Labour Organization (ILO).

**Influence** – As a key policymaker, the Ministry wields significant influence over federal labour welfare initiatives. However, coordination challenges with provincial governments limit its effectiveness, particularly after 18<sup>th</sup> Amendment.

**Impact** – The Ministry's administrative oversight contributes to national labour welfare but often falls short in addressing systemic issues, such as informal sector inclusion and enforcement gaps. Jurisdictional overlaps with provinces create inefficiencies in achieving its objectives.

### ***Workers' Welfare Fund (Federal Level)***

**Role** – The WWF provides housing, education, and financial assistance to industrial workers. It oversees the allocation and disbursement of funds for welfare initiatives, supported by employer contributions.

**Influence** – The WWF has considerable financial resources and a tripartite governance structure, giving it a prominent role in labour welfare. However, its focus on formal sector workers limits its reach and inclusivity.

**Impact** – The fund’s restricted coverage excludes informal sector workers, leaving the majority of the workforce without access to critical welfare programs. Governance issues, such as delays in fund disbursement and limited transparency, reduce its overall effectiveness.

### *Employees Old-Age Benefits Institution (EOBI)*

**Role** – The EOBI administers pensions and social security for registered private-sector employees. It collects contributions from employers and ensures disbursement to retirees or their families, acting as a critical social safety net for workers in formal sectors. The institution also supports post-retirement security through a structured mechanism.

**Influence** – The EOBI holds significant influence due to its role in providing social security. However, low registration of employers and workers, combined with limited awareness among beneficiaries, reduces its operational reach.

Its ability to influence policy is moderate and often hindered by outdated systems and financial inefficiencies.

**Impact** – The institution’s restricted coverage limits its effectiveness in addressing the needs of informal sector workers, who form a significant portion of the workforce. Expanding coverage to include these workers remains a critical challenge. Despite its structured mechanism, the EOBI’s financial and administrative inefficiencies diminish its potential impact on improving social security for workers.

### *Provincial Labour Departments*

**Role** – These departments administer labour laws and oversee the provincial Workers' Welfare Boards. They are responsible for inspections, compliance, and dispute resolution.

**Influence** – Provincial labour department’s play a critical role in implementing labour policies. However, limited resources, weak enforcement mechanisms, and capacity issues reduce their impact.

**Impact** – The inconsistent performance of labour departments across provinces results in uneven implementation of labour laws and welfare initiatives. Informal workers remain largely excluded from their purview, further exacerbating labour challenges.

### *Workers' Welfare Boards (Provincial Level)*

**Role** – Provincial Workers' Welfare Boards implement welfare measures such as housing, education, and training for workers and their families. They address region-specific challenges in line with provincial needs.

**Influence** – The boards operate autonomously but face resource and capacity constraints. Their influence varies across provinces, with industrialized regions like Punjab demonstrating better performance.

**Impact** – While these boards address region-specific challenges, their limited focus on informal workers, particularly in rural areas, undermines inclusivity. Bureaucratic inefficiencies further hinder their ability to deliver effective welfare programs.

### *International Organizations (e.g., ILO)*

**Role** – The ILO and other international organizations provide technical assistance, set labour standards, and monitor compliance with international conventions. They facilitate social dialogue among stakeholders and support capacity-building efforts.

**Influence** – International organizations have significant influence through their ability to shape national policies and provide funding for labour-related projects. Their recommendations often guide reforms and capacity-building efforts.

**Impact** – While these organizations promote alignment with international standards, weak enforcement and lack of local ownership undermine their effectiveness. The ILO's focus on capacity-building has improved labour policies but has yet to address enforcement gaps.

### *Non-Governmental Organizations (NGOs) and Civil Society Organizations (CSOs)*

**Role** – NGOs and CSOs advocate for labour rights, conduct research, and provide support to vulnerable groups such as women, children, and informal workers. They supplement government efforts by raising awareness and providing legal and logistical support to workers.

**Influence** – NGOs influence labour policies through advocacy and awareness campaigns. However, their impact is limited by resource constraints and lack of direct authority.

**Impact** – NGOs and CSOs play a crucial role in highlighting labour rights issues and providing support to marginalized groups. Their efforts complement government initiatives but are insufficient to address systemic challenges on a large scale.

### *Judiciary*

**Role** – The judiciary adjudicates labour disputes, enforces labour laws, and ensures compliance with constitutional provisions. It holds authority in resolving disputes and holding employers accountable.

**Influence** – The judiciary has significant influence in upholding labour rights. However, delays in case resolution and limited access to justice for workers reduce its effectiveness.

**Impact** – Judicial intervention has addressed labor rights violations, but systemic inefficiencies hinder timely and fair dispute resolution. Greater efficiency is needed to enhance its reform impact.

## *SWOT and EETH Analysis*

### *SWOT Analysis*

#### **Strengths**

- a. **Legal Framework and Policy Mandate** – The Workers Welfare Fund (WWF) operates under a robust legal mandate provided by the Workers Welfare Fund Ordinance, 1971, ensuring financial resources for worker welfare through employer contributions.  
Provincial Workers Welfare Boards (WWBs) are empowered under the 18th Amendment to tailor welfare measures according to localized needs, demonstrating flexibility and regional alignment.  
Labour Departments are equipped with the mandate to enforce a range of labour laws, including minimum wage, safety standards, and dispute resolution mechanisms.
- b. **Financial Resources** – The WWF has significant financial capacity, with its fund size increasing from PKR 14 billion in 2021-2022 to PKR 50 billion in 2022-2023, enabling large-scale welfare projects.  
Provincial WWBs leverage federal fund disbursements and employer contributions, providing avenues for financing welfare schemes.
- c. **Tripartite Governance** – WWF and WWBs incorporate representatives from employers, workers, and the government, fostering inclusive decision-making aligned with International Labour Organization (ILO) principles.  
Governance structures ensure dialogue between stakeholders, promoting equitable labour practices.
- d. **Alignment with ILO Conventions** – Programs under WWF and WWBs, such as housing, education, and grants, align with key ILO conventions, including Convention No. 102 (Social Security) and Convention No. 182 (Child Labour).  
Labour Departments enforce compliance with internationally ratified labour standards, ensuring Pakistan's adherence to global commitments.
- e. **Provincial Decentralization** – Post-18th Amendment devolution has enabled provinces to design and implement labour policies that cater to their specific demographic and economic conditions, such as the Sindh Labour Policy, 2018 and the Khyber Pakhtunkhwa Workers Welfare Policy, 2018.

## Weaknesses

- f. **Limited Coverage of Informal Sector** – WWF and WWBs are restricted to formal sector workers, leaving 72.5% of Pakistan's labour force in the informal sector without access to social protections.  
Labour Departments lack mechanisms to regulate informal employment, which dominates rural and semi-urban economies.
- g. **Resource and Capacity Constraints** - Provincial WWBs, especially in less industrialized provinces like Balochistan, face financial and administrative bottlenecks, resulting in uneven implementation of welfare programs.  
Labour Departments are underfunded, with weak inspection frameworks and insufficient human resources to monitor compliance effectively.
- h. **Fragmented Legal and Policy Frameworks** – Provincial disparities in labour laws, such as varying definitions of “workers” and inconsistent standards in the Factories Acts, create challenges in enforcement and compliance.  
Labour Departments and WWBs operate in silos, leading to poor coordination and overlapping jurisdictions between federal and provincial institutions.
- i. **Governance and Transparency Issues** – Delays in disbursements and fund allocations by the WWF hinder timely implementation of welfare schemes.  
A lack of accountability mechanisms in the WWF and WWBs undermines stakeholder confidence and fosters inefficiencies in service delivery.
- j. **Gender and Sectoral Exclusion** – Welfare initiatives rarely address the needs of female workers and home-based labourers, who are disproportionately affected by poor working conditions and low wages.  
Rural and agricultural workers, constituting a significant portion of the workforce, are excluded from the ambit of provincial WWBs.

## Opportunities

- k. **Policy and Legal Reforms** – Aligning provincial labour laws with international standards, such as ILO Convention No. 87 (Freedom of Association) and Convention No. 98 (Collective Bargaining Rights), can strengthen labour protections.  
Introducing amendments to extend WWF and WWBs' coverage to informal workers, including agricultural and home-based labourers, can expand social protections.



- l. **Capacity-Building Initiatives** – Enhancing the administrative capacity of Labour Departments through training and digital tools can improve inspection and enforcement mechanisms. Establishing partnerships with NGOs, CSOs, and international organizations like the ILO can provide technical assistance and funding for labour welfare programs.
- m. **Technological Integration** – Developing digital platforms for real-time monitoring of fund utilization and program delivery can enhance transparency and accountability in WWF and WWBs. Leveraging technology to facilitate registration of informal workers and disbursement of benefits can ensure inclusivity.
- n. **Strengthening Tripartite Engagement** – Expanding the role of tripartite bodies in governance to include representation from informal sector workers can improve policy inclusivity and advocacy for vulnerable groups. Promoting dialogue between provincial and federal institutions can harmonize labour policies and eliminate jurisdictional conflicts.
- o. **Expanding Welfare Coverage** – Implementing tailored welfare schemes for women, such as maternity benefits and childcare support, can address gender disparities in labour protections. Introducing subsidized housing and healthcare for rural workers through provincial WWBs can promote equitable welfare distribution.

### Threats

- p. **Informal Sector Dominance** – The persistence of informal employment undermines the impact of government welfare initiatives, perpetuating labour exploitation and non-compliance with labour laws.
- q. **Employer Resistance** – Employers, particularly in the SME sector, resist formalizing workers due to perceived financial burdens, limiting the scope of WWF and WWBs' programs. Active suppression of unionization efforts by industrialists hampers collective bargaining and weakens labour rights advocacy.
- r. **Bureaucratic Inefficiencies** – Delays in fund disbursement and decision-making at WWF and WWBs compromise their responsiveness to workers' needs, eroding trust among stakeholders. Ineffective grievance redress mechanisms discourage workers from asserting their rights, exacerbating non-compliance with labour laws.

- s. **Economic Instability** – Economic fluctuations and fiscal constraints may impact employer contributions to the WWF, reducing resources available for welfare programs. Rising inflation and unemployment can exacerbate worker vulnerability, increasing the demand for welfare services beyond institutional capacity.
- t. **Weak Enforcement of Labour Laws** – Insufficient inspection mechanisms and low penalties for non-compliance contribute to widespread violations of labour laws, undermining institutional credibility. Political interference in labour governance risks diluting institutional autonomy and effectiveness, particularly at the provincial level.

### *EETH Analysis*

#### **i. Enhancement of Strengths**

- a. **Strengthen Financial Resources** – Develop an efficient mechanism to monitor and optimize fund utilization for WWF and WWBs to ensure timely disbursement and project implementation.
- b. **Leverage Legal Mandate** – Expand tripartite governance structures to further enhance stakeholder engagement and compliance with labour laws.
- c. **Promote ILO Alignment** – Capitalize on the existing alignment with key ILO conventions by developing detailed compliance mechanisms for conventions like social security (Convention No. 102).
- d. **Provincial Adaptation** – Build on provincial autonomy to address region-specific labour welfare challenges, such as housing and education for industrial and rural workers.

#### **ii. Elimination of Weaknesses**

- a. **Expand Informal Sector Coverage** – Amend the Workers Welfare Fund Ordinance, 1971, and related provincial policies to include informal workers in welfare programs like healthcare and pensions.
- b. **Strengthen Coordination** – Create a federal-provincial coordination committee to streamline labour policy implementation and reduce jurisdictional conflicts.
- c. **Capacity-Building** – Invest in digital tools and training programs for labour inspectors to enhance enforcement of labour laws and minimize violations.
- d. **Improve Governance** – Introduce accountability frameworks, such as performance audits and stakeholder feedback mechanisms, to ensure transparency in WWF and WWBs' operations.

- e. **Address Gender Exclusion** – Mandate gender-specific welfare initiatives and representation in decision-making bodies at WWF and WWBs to improve inclusion and equity.
- iii. **Taking Advantage of Opportunities**
- a. **Legal and Policy Reforms** – Align provincial labour laws with international standards to improve Pakistan's global labour compliance standing and attract international funding and partnerships.
  - b. **Enhance Tripartite Engagement** – Broaden the representation of informal sector workers and marginalized groups in tripartite bodies to increase inclusivity.
  - c. **Technology Integration** – Develop digital registration platforms to formalize informal sector workers and facilitate access to welfare benefits.
  - d. **Collabouration with International Organizations** – Leverage partnerships with ILO, World Bank, and UNDP to secure technical and financial support for expanding welfare programs and improving enforcement.
  - e. **Focus on Rural Inclusion** – Develop targeted welfare schemes for rural and agricultural workers, such as mobile health units and vocational training centers, to improve their working conditions and productivity.
- iv. **Hedging Against Threats**
- a. **Mitigate Informal Sector Risks** – Launch awareness campaigns and outreach programs to encourage informal sector registration and compliance with labour laws.
  - b. **Address Employer Resistance** – Provide incentives, such as tax breaks or subsidies, to employers who formalize their workforce and comply with labour standards.
  - c. **Tackle Bureaucratic Inefficiencies** – Introduce a grievance redressal portal to ensure swift resolution of labour complaints and improve institutional responsiveness.
  - d. **Economic Contingency Plans** – Establish reserve funds within WWF to hedge against economic instability and maintain welfare programs during fiscal constraints.
  - e. **Strengthen Inspections** – Implement strict penalties for non-compliance with labour laws, supported by improved inspection mechanisms to deter violations.
  - f. **Safeguard Autonomy** – Advocate for legislative amendments to reduce political interference in labour governance, ensuring institutional independence and efficiency.

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*Blavatnik School of Government's Oxford Index of Public  
Administration*

Blavatnik OIPA Framework in relation to Public Policy, Strategy Leadership, National Delivery, and People and Processes has been applied to conduct a Gap Analysis with Malaysia and India. This will provide a more holistic approach to understanding the gaps in labour policies, regulations, practices, and welfare activities while addressing Industrial Development and Social Protection.

*Malaysia*

Based on OIPA Framework, the Gap Analysis with Malaysia revealed following key insights:

- i. **Public Policy** – Malaysia's labour and welfare policies are more comprehensive, modernized, and enforced effectively nationwide. Pakistan's fragmented and outdated policies result in inconsistent implementation, particularly at the provincial level.
- ii. **Strategy Leadership** – Malaysia benefits from cohesive leadership and tripartite approaches, ensuring that industrial relations and social protection are managed uniformly. In Pakistan, there is a lack of coordinated leadership, hindering policy enforcement and industrial relations management.
- iii. **National Delivery** – Malaysia's centralized delivery mechanisms ensure consistent protection and welfare for all workers. Pakistan's delivery is hampered by outdated systems and gaps in enforcement, especially in rural and informal sectors.
- iv. **People and Processes** – Malaysia's processes are streamlined and efficient, supported by clear regulations and systematic monitoring. In contrast, Pakistan faces inefficiencies in social security administration, industrial dispute resolution, and migrant worker protection due to a lack of infrastructure and resources.

*India*

Based on OIPA Framework, the Gap Analysis with India revealed following key insights:

- i. **Public Policy** – India's Unified labour codes ensure inclusivity and adaptability to modern labour trends. However, Pakistan's fragmented and outdated laws fail to address emerging labour challenges like the gig economy and informal sector workers.
- ii. **Strategy Leadership** – India's centralized and proactive leadership promotes reform and effective governance in labour policies. However, in case of Pakistan, the decentralized and reactive leadership limits the scope of reforms and fails to address regional disparities.

- iii. **National Delivery** – India’s centralized delivery ensures uniformity, accessibility, and consistency across states. On the other hand, in Pakistan, the decentralized systems result in uneven delivery, delays, and inefficiencies in labour policy implementation.
- iv. **People and Processes** – India’s efficient processes with better-defined roles, training, and technology-driven mechanisms ensure higher compliance. Whereas, Pakistan’s outdated processes and limited resource allocation hinder effective policy execution.

### *Comparative Analysis of Global Best Practices*

Best Practice	Name of Practice	Country	Practical Example	Viability for Pakistan
Anti-Discrimination Policies in Hiring	Equal Employment Opportunity (EEO)	Canada	Canada’s Employment Equity Act ensures that employers provide equal opportunities in hiring and promotion, promoting diversity in workplaces.	Pakistan could enforce stricter anti-discrimination laws in hiring processes, creating initiatives for better representation of women, minorities, and persons with disabilities.
Workplace Safety Regulations	Health and Safety Standards	United Kingdom	The UK’s Health and Safety Executive (HSE) sets regulations for workplace safety, conducting inspections, and imposing penalties for violations.	Pakistan can adopt comprehensive workplace safety regulations and introduce regular safety audits, with strong penalties for employers who fail to comply.
Progressive Minimum Wage Policies	Fair Wage Policy	Australia	Australia’s Fair Work Commission periodically reviews and adjusts the minimum wage to reflect the cost of living, economic conditions, and inflation.	Pakistan can introduce a system for periodic wage reviews, ensuring that the minimum wage reflects current living costs and inflation rates.

Best Practice	Name of Practice	Country	Practical Example	Viability for Pakistan
Skill Development and Apprenticeship Programs	Dual Education System (Vocational Training)	Germany	Germany's dual education system combines vocational training with theoretical education, allowing students to gain practical experience while studying.	Pakistan can introduce a dual education system by partnering with industries to provide practical training, offering students hands-on experience while they complete their education.
Formalizing Informal Labour	Labour Formalization Program	Brazil	Brazil implemented the "Simple Nacional" program, which offers incentives to small businesses to formalize their workers, providing them with benefits like social security.	Pakistan can introduce a similar program, offering tax incentives and financial assistance to small businesses for registering informal workers, bringing them into the formal economy.

From the analysis of the tabulated data above, it has been assessed that by formalizing the informal labour, as seen in Brazil, Pakistan could benefit from a more inclusive approach to integrating the informal sector into the formal economy. This integration would allow workers in the informal sector to access social protection, healthcare, and other essential benefits. When combined with best practices from Canada, the UK, Australia, and Germany, this model offers a comprehensive framework for improving labour rights protection, promoting industrial growth, and ensuring equitable development in Pakistan.

### *Gap Analysis*

#### **i. Fragmentation and Inconsistency**

- a. **Provincial Disparities Post-18th Amendment** - The devolution of labour matters has led to fragmented laws across provinces, resulting in inconsistencies. For instance, Sindh raised the minimum working age to 15, aligning with international standards, but other provinces maintain the threshold at 14. As regards, ILO Convention No. 90 (Night Work for Young Persons), provincial laws do not fully comply with the ILO's prohibition of night work for individuals under 18.

- b. **Partial Ratification and Enforcement** – While Pakistan has ratified 36 ILO conventions, only 30 are actively implemented. Critical gaps remain in enforcing ILO Conventions No. 29 and 105 (Forced Labour), No. 182 (Worst Forms of Child Labour), and No. 100 (Equal Remuneration).
- c. **Outdated Laws** – Factories Act, 1934, a colonial-era law, though adapted by provinces, does not address modern labour challenges, such as the gig economy or flexible working conditions. It fails to align with ILO Convention No. 155 regarding Occupational Safety and Health. Furthermore, despite existence of Bonded Labour System (Abolition) Act, 1992, bonded labour persists, undermining Pakistan's compliance with ILO Conventions No. 29 and 105.
- d. **Exclusion of Informal Sector Workers** – Current laws focus on formal workers, excluding 72.5% of Pakistan's workforce in the informal economy. Informal sector workers lack access to pensions, healthcare, and other social protections due to weak regulatory mechanisms and employer resistance. This violates ILO Convention No. 102 (Social Security Minimum Standards), which mandates social protections for all workers.

## ii. Policy Gaps

- a. **Lack of a Unified National Policy** – Pakistan is affected by fragmented provincial policies, meaning thereby that Pakistan lacks a cohesive national labour policy, leading to disparities across provinces.
- b. **Misalignment with ILO Standards** – Policies fail to adequately address collective bargaining rights (ILO Conventions No. 87 and 98) and minimum wage adjustments in line with inflation (ILO Convention No. 131).
- c. **Limited Coverage of Social Protection** – Policies prioritize industrial labour while neglecting rural and informal workers, particularly women and children. This undermines commitments to ILO Conventions No. 100, 111, 138, and 182.
- d. **Gender and Sectoral Disparities** – Despite ratifying ILO Conventions No. 100 (Equal Remuneration) and No. 111 (Discrimination in Employment and Occupation), Pakistan's policies fail to enforce equal pay or address workplace discrimination effectively. Female labour force participation remains low at 21.5%.

### iii. Institutional Gaps

- a. **Governance and Coordination Issues** – While Workers Welfare Fund (WWF) aligns with ILO Convention No. 102 on social security, the WWF excludes informal workers and lacks robust accountability mechanisms. Moreover, delays in fund disbursements undermine its effectiveness.
- b. **Provincial Workers Welfare Boards (PWWBs)** face severe resource and capacity constraints, especially in less industrialized provinces like Balochistan, leading to uneven implementation of welfare initiatives.
- c. **Labour Departments** – Provincial labour departments are underfunded and poorly equipped to enforce labour laws effectively. This violates ILO Convention No. 81 (Labour Inspection), which mandates efficient inspection mechanisms.
- d. **Judiciary** – The judiciary plays a critical role in adjudicating labour disputes but suffers from significant delays, limiting workers' ability to assert rights guaranteed under ILO Conventions No. 87 and 98.

### iv. Practice Gaps

- a. **Weak Enforcement Mechanisms** – Labour inspections are infrequent and inadequate, violating ILO Convention No. 81. Many employers evade compliance with minimum wage laws and workplace safety standards.
- b. **Exclusion of Vulnerable Groups** – Female labour force participation is extremely low (21.5%). There is persistent issue of Child Labour. Despite legal prohibitions and ratification of ILO Conventions No. 138 and 182, 3.3 million children remain engaged in labour, highlighting weak enforcement. In addition to this, there exist Gender Disparities, since limited provisions for maternity leave and workplace accommodations violate ILO Conventions No. 100 and 111.
- c. **Low Unionization Rates** – Union membership is limited to 1-3% of the workforce, and informal workers are often excluded from union activities.
- d. **Workplace Safety Violations** – High-profile incidents, such as the Baldia Factory fire and mine collapses, reveal systemic failures in enforcing workplace safety standards.
- e. **Health Hazards** – Workers in hazardous industries, such as brick kilns and mining, face significant health risks without adequate protections.
- f. **EOBI Coverage** – The Employees Old-Age Benefits Institution (EOBI) covers only formal workers, leaving the majority of the workforce unprotected.



- g. **Underutilized Funds** – While WWF funds have grown significantly (e.g., PKR 50 billion in 2022-23), their impact remains limited due to inefficiencies and delayed disbursement.
- v. **Technological and Process Inefficiencies** – There is minimal use of digital systems to register workers, monitor compliance, or facilitate grievance redressal, which reduces transparency and efficiency.
- vi. **Gaps in Alignment with the OIPA Framework**
  - a. **Public Policy** – Unlike Malaysia and India, Pakistan’s labour policies are fragmented and outdated, failing to address modern challenges like automation and gig economy labour. This misalignment with ILO Conventions No. 102, 87, and 98 results in inconsistent protections.
  - b. **Strategy Leadership** – Weak coordination between federal and provincial leadership undermines governance. Malaysia’s cohesive tripartite approach offers a model for better alignment with ILO Convention No. 144 (Tripartite Consultation).
  - c. **National Delivery** – Delivery mechanisms are inconsistent, with provinces like Punjab outperforming others. Centralized systems, as seen in India, could improve compliance with ILO Convention No. 102.
  - d. **People and Processes** – Outdated processes and limited resource allocation hinder effective policy execution, violating ILO Convention No. 81. India’s streamlined mechanisms and Malaysia’s digital tools provide replicable models.
- vii. **Gaps in Adoption of Global Best Practices**
  - a. **Anti-Discrimination Policies** – Pakistan lacks legislation akin to Canada’s Equal Employment Opportunity (EEO) framework, violating ILO Conventions No. 100 and 111.
  - b. **Workplace Safety** – Inadequate implementation of safety standards contrasts with the UK’s robust compliance with ILO Convention No. 155.
  - c. **Progressive Minimum Wage Policies** – Pakistan does not adjust minimum wages regularly, violating ILO Convention No. 131. Australia’s Fair Wage Policy offers a replicable model.
  - d. **Skill Development** – Limited vocational training programs hinder alignment with ILO Convention No. 142 (Human Resources Development). Germany’s dual education system could address this gap.

- e. **Formalization of Informal Sector** – The absence of formalization programs violates ILO Convention No. 102. Brazil's "Simples Nacional" program provides a viable model for Pakistan.

### *Issues and Challenges*

- i. **Fragmentation and Inconsistencies in Legal Framework**
  - a. Post-18th Amendment devolution has resulted in fragmented provincial labour laws, leading to inconsistencies in labour standards and governance.
  - b. Lack of alignment between federal and provincial regulations, particularly concerning informal sector workers and night work for young persons, creates gaps in compliance with international standards like ILO conventions.
  - c. Outdated laws, such as the Factories Act, 1934, fail to address modern labour challenges, including the gig economy and flexible working conditions.
- ii. **Exclusion of Informal Sector Workers**
  - a. Approximately 72.5% of the labour force in the informal sector remains excluded from social protections like pensions, healthcare, and workplace safety provisions.
  - b. Informal workers lack access to trade union rights, preventing them from advocating for fair wages and improved working conditions.
  - c. Exclusion of agricultural workers worsens vulnerabilities and socio-economic disparities.
- iii. **Weak Enforcement of Labour Laws**
  - a. Infrequent and inadequate labour inspections violate ILO Convention No. 81 on Labour Inspection.
  - b. Significant gaps exist in enforcing laws related to workplace safety, minimum wages and bonded labour.
  - c. Employers often evade compliance, and weak penalties fail to deter violations.
- iv. **Gender Disparities and Exclusion of Vulnerable Groups**
  - a. Female labour force participation is extremely low (21.5%), with limited access to maternity leave, workplace accommodations, and leadership positions.
  - b. Workplace discrimination and unequal pay for women persist, despite ratification of ILO Conventions No. 100 (Equal Remuneration) and No. 111 (Discrimination in Employment).
  - c. Child labour continues to be a significant issue, with 3.3 million children engaged in labour, particularly in hazardous conditions, violating ILO Conventions No. 138 and 182.

- v. Weak Institutional Capacity and Governance**
  - a. Delays in fund disbursements by the Workers Welfare Fund (WWF) and provincial Workers Welfare Boards (WWBs) hinder timely implementation of welfare programs.
  - b. Provincial labour department's lack resources, human capital, and technological tools, resulting in ineffective enforcement of labour laws.
  - c. Governance structures, including tripartite mechanisms, lack transparency and accountability, reducing stakeholder confidence.
- vi. Lack of Unified National Policy**
  - a. Absence of a cohesive national labour policy leads to disparities across provinces and undermines uniform governance.
  - b. Misalignment between labour policies and ILO standards, particularly regarding collective bargaining rights (ILO Conventions No. 87 and 98) and minimum wage adjustments (ILO Convention No. 131).
- vii. Workplace Safety and Health Hazards**
  - a. Frequent workplace safety violations, such as the Baldia Factory fire and mine collapses, highlight systemic enforcement failures of occupational safety standards.
  - b. Workers in hazardous industries, including mining and brick kilns, face severe health risks due to inadequate safety measures.
- viii. Insufficient Social Protection Programs**
  - a. Social protection initiatives, such as those by the Employees Old-Age Benefits Institution (EOBI) and WWF, are limited to formal sector workers, excluding the majority of the workforce.
  - b. Provincial Workers Welfare Boards (PWWBs) fail to address the needs of marginalized groups, including rural and agricultural workers.
- ix. Low Unionization and Limited Collective Bargaining**
  - a. Union membership is limited to 1-3% of the workforce, with structural and procedural barriers hindering unionization efforts.
  - b. Employers resist union activities, undermining collective bargaining and advocacy for workers' rights.
- x. Technological and Process Inefficiencies**
  - a. Minimal use of technology to register workers, monitor compliance, or facilitate grievance redressal reduces transparency and efficiency.
  - b. Outdated processes and manual systems impede the effective implementation of labour policies and welfare programs.

- xi. Economic and Employer Resistance**
  - a. Employers, particularly in SMEs, resist formalizing their workforce, citing financial constraints, thereby perpetuating informal employment.
  - b. Economic instability, inflation, and rising costs increase demand for welfare services, stretching institutional capacities.
- xii. Limited Adoption of Global Best Practices**
  - a. Lack of anti-discrimination policies, comprehensive workplace safety standards, and skill development initiatives leaves Pakistan behind global leaders like Canada, the UK, and Germany.
  - b. Failure to implement a formalization program akin to Brazil's "Simples Nacional" prevents the inclusion of informal workers into the formal economy.
- xiii. Case Scenarios**
  - a. **Brick Maker's Case** - Issues identified through the examination of case study of Brick Maker's Case include bonded labour, inter-generational bondage, weak enforcement of labour laws, discriminations against marginalized groups, gender-based violence, lack of access to basic services, non-compliance with international obligations, corruption, lack of awareness and advocacy and unsafe working conditions.
  - b. **Textile Industry's Case** - Issues identified through the examination of case study of Textile Industry Case include lack of employment contracts, non-payment of minimum wages, under paid skilled workers, exploitative contracting system (third-party contractors / middle men), lack of social security, weak labour inspections, suppression of union, corporate accountability issues, economic hardships for labours and governance deficiencies.

### *Conclusion*

A critical evaluation of labour-related policies, regulations, practices, and welfare activities in Pakistan highlights an urgent need for reform. Despite a strong legal framework and commitment to international labour standards through key ILO conventions, significant challenges in enforcement, governance, and inclusivity persist.

The fragmentation of labour policies following the 18th Amendment has created regional disparities, particularly regarding minimum working age, collective bargaining rights, and social protections for informal sector workers. Institutional weaknesses and poor coordination between federal and provincial bodies further undermine initiatives like the Workers Welfare Fund (WWF) and Provincial Workers Welfare Boards (PWWBs). Additionally, outdated legal frameworks and weak enforcement prevent the realization of fair labour rights.

With 72.5% of the labour force engaged in informal employment, extending social protections and combatting exploitative practices like bonded and child labour remains a daunting challenge. Gender disparities, low unionization rates, and insufficient vocational training leave many workers vulnerable.

Comparative studies with countries like Malaysia, India, and Brazil suggest actionable reforms, including a unified national labour policy, alignment of provincial laws with international standards, and the formalization of informal work. Strengthening governance and promoting collaboration are essential for achieving sustainable industrial development.

To move forward, Pakistan must modernize its legal frameworks, enhance capacity-building efforts, and adopt global best practices. By doing so, the nation can foster equitable industrial development and secure the dignity and well-being of its workforce, paving the way for a more inclusive and prosperous future.

## *Recommendations*

The following recommendations are formulated to address the systemic gaps and challenges identified in Pakistan's labour policies, regulations, practices, and welfare mechanisms. By focusing on legal reforms, institutional capacity-building, and enhanced inclusivity, these actionable measures aim to promote equitable industrial growth and strengthen social protection frameworks. Incorporating global best practices and leveraging technology, these proposals are designed to foster sustainable development while upholding the dignity and rights of Pakistan's workforce.

**PLIMS** – As a baseline, for equitable application and adoption of standardized laws and policies across the length and breadth of country, it is imperative that a centralized database i.e Pakistan Labour Information Management System (PLIMS) be introduced. The PLIMS model is proposed to be based on the Benazir Income Support (BISP) Model, wherein the Computerize National Identity Card (CNIC) number of each labour shall serve as unique identification Social Security Number. In this regard, the integrated database shall take on-board all the key stakeholder i.e. Ministry of Overseas Pakistan and Human Resource Development, Ministry of Federal Education and Professional Training, Workers' Welfare Fund, National Vocational and Technical Training Center, Provincial Labour Departments, Provincial Industries Department, Workers Welfare Boards and Employees Social Security Institutes. Keeping in view the importance of public-centric policy making and implementation, the database shall also extend interactive dashboard option to all the private sector stakeholders, i.e. Employers, Employers' Federation, Unions and key National and International human and labour rights organizations. The centralized database shall also incorporate a unified forum for easy access to laws and policies and provide a forum for identification of misalignments in federal and provincial laws as well as providing an e-forum to avoid bureaucratic red-tape in aligning the laws with the provisions of International Labour Organization's conventions. The dashboards for the private entities shall serve the purpose of complaint redressal in addition to services that may be identified during the course of program development and implementation.

### **i. Legal and Policy Reforms**

- a. Develop a Unified National Labour Policy – Create a cohesive policy that harmonizes federal and provincial labour laws post-18th Amendment, ensuring uniformity and alignment with international standards.
- b. Revise Outdated Laws – Update the Factories Act, 1934, and related legislation to address modern challenges such as gig

- economy labour, flexible work arrangements, and occupational safety (ILO Convention No. 155).
- c. Extend Coverage to Informal Sector – Amend the Workers Welfare Fund Ordinance, 1971, and related provincial laws to include informal sector workers in social protections like healthcare, pensions, and workplace safety.
- ii. **Improving Institutional Capacity and Governance**
  - a. Enhance Provincial Labour Departments – Allocate adequate funding, training, and digital tools to improve inspection mechanisms and enforce labour laws effectively.
  - b. Strengthen the Workers Welfare Fund (WWF) – Establish accountability mechanisms, such as regular audits and grievance redressal systems, to improve fund utilization and transparency.
  - c. Bolster Provincial Workers Welfare Boards (PWWBs) – Provide financial and technical support to less industrialized provinces like Balochistan to reduce disparities in welfare program implementation.
- iii. **Formalizing the Informal Sector**
  - a. Introduce Formalization Incentives – Launch programs similar to Brazil’s "Simples Nacional," offering tax benefits and financial support to small businesses that formalize their workforce.
  - b. Digital Worker Registration – Develop a centralized, technology-driven platform to register informal workers, ensuring they can access social protection schemes.
- iv. **Promoting Gender Equality and Social Inclusion**
  - a. Mandate Gender-Specific Welfare Initiatives – Introduce workplace accommodations, maternity benefits, and childcare support tailored to female workers’ needs.
  - b. Address Child Labour – Strengthen enforcement of child labour laws and provide alternative education and vocational training for children engaged in hazardous work.
  - c. Empower Marginalized Groups – Ensure equitable representation of women, minorities, and informal workers in union leadership and tripartite decision-making bodies.
- v. **Strengthening Enforcement Mechanisms**
  - a. Reform Labour Inspection Framework – Increase the frequency and quality of labour inspections, supported by trained personnel and digital monitoring tools.
  - b. Enforce Minimum Wage Compliance – Establish a system of periodic minimum wage reviews tied to inflation and cost of living, with penalties for non-compliance.
  - c. Combat Bonded Labour – Strengthen enforcement of the Bonded Labour System (Abolition) Act, 1992, through

targeted inspections and rehabilitation programs for affected workers.

**vi. Promoting Workplace Safety**

- a. Adopt Comprehensive Safety Standards – Enforce rigorous workplace safety regulations aligned with international best practices (e.g., UK's Health and Safety Executive model).
- b. Regular Safety Audits – Mandate periodic safety audits in industries prone to hazardous conditions, such as mining and garment manufacturing.

**vii. Enhancing Social Protection Coverage**

- a. Expand EOBI Coverage – Simplify registration processes and incentivize employers to enroll workers in the Employees Old-Age Benefits Institution (EOBI).
- b. Introduce Universal Social Protection Framework – Develop provincial frameworks that extend social protections like housing, healthcare, and pensions to all workers, including those in rural and informal sectors.

**viii. Encouraging Unionization and Collective Bargaining**

- a. Simplify Union Registration Processes – Reduce bureaucratic hurdles and establish protections against employer retaliation to encourage union formation.
- b. Empower Trade Unions – Increase union participation in policymaking and strengthen their capacity to advocate for workers' rights.

**ix. Technological Integration**

- a. Leverage Technology for Transparency – Implement digital platforms for fund disbursement, compliance monitoring, and grievance redressal to reduce inefficiencies and corruption.
- b. Real-Time Data Collection – Develop a labour market information system to monitor employment trends, identify gaps, and guide policy interventions.

**x. Adopting Global Best Practices**

- a. Skill Development Programs – Partner with industries to introduce vocational training and dual education systems similar to Germany's model.
- b. Progressive Wage Policies – Establish a Fair Wage Commission to periodically adjust wages based on economic conditions, following Australia's example.
- c. Anti-Discrimination Legislation – Implement hiring and workplace equality measures akin to Canada's Equal Employment Opportunity (EEO) framework.

**xi. Stakeholder Engagement and Public Awareness**

- a. Promote Tripartite Collaboration – Enhance engagement among government, employers, and labour unions to address systemic issues and foster collective solutions.



- b. Public Awareness Campaigns – Educate workers about their rights and employers about their responsibilities under labour laws, focusing on informal and marginalized workers.
- xii. **Economic Incentives for Compliance**
  - a. Introduce Tax Breaks for Compliant Employers – Offer financial incentives to employers who adhere to labour laws, formalize their workforce, and provide social protections.
  - b. Subsidized Welfare Contribution – Provide partial subsidies for welfare contributions to encourage the inclusion of informal workers in social protection schemes.
- xiii. **Case Scenario Based Recommendations**
  - a. Train law enforcement officials, labour inspectors, and judiciary on bonded labour laws and human rights frameworks to ensure proper enforcement.
  - b. Establish dedicated expedited trial forums for bonded labour cases to expedite justice.
  - c. Implement stricter penalties under the PPC and ensure regular monitoring of kiln owners and labour contractors.
  - d. Launch awareness programs targeting brick kiln workers, emphasizing their rights under the Bonded Labour System (Abolition) Act, 1992 and other labour laws.

### **Practical Implementation Plan**

#### **I. Short Term (1–3 Years)**

- a. Legal and Policy Reforms:
  - i. Develop a Unified National Labour Policy to harmonize provincial laws.
  - ii. Update the Factories Act, 1934, incorporating gig economy challenges, flexible work, and modern occupational safety standards.
  - iii. Amend the Workers Welfare Fund Ordinance, 1971 to include informal sector workers.
  - iv. Introduce simplified union registration processes to encourage unionization.
  - v. Mandate gender-specific welfare initiatives, including maternity leave and workplace accommodations.
- b. Institutional Strengthening:
  - i. Allocate additional funding and resources to provincial labour departments.
  - ii. Establish accountability mechanisms for WWF and WWBs.
  - iii. Train inspectors on modern enforcement techniques and digital tools.

- iv. Develop a centralized digital worker registration platform for informal workers.
  - c. Workplace Safety and Social Protection:
    - i. Enforce safety audits for high-risk industries like mining and garment manufacturing.
    - ii. Expand EOBI registration to cover informal workers.
    - iii. Conduct awareness campaigns about worker rights and employer responsibilities.
- II. Medium Term (3-5 Years)**
  - a. Policy Alignment and Inclusion:
    - i. Align provincial labour laws with ILO conventions.
    - ii. Introduce a Universal Social Protection Framework for all workers, focusing on healthcare, pensions, and housing.
    - iii. Implement gender equity provisions by increasing women's participation in union leadership.
  - b. Institutional Development:
    - i. Create a federal-provincial labour coordination committee to ensure policy coherence.
    - ii. Digitize and streamline grievance redressal mechanisms.
    - iii. Expand capacity-building initiatives for labour inspectors and officials.
  - c. Technology and Skill Development:
    - i. Develop vocational training centers in partnership with industries following Germany's dual education model.
    - ii. Leverage technology for real-time monitoring of labour laws and fund disbursements.
- III. Long Term (5-7 Years)**
  - a. Legal Reforms:
    - i. Periodically update labour laws to adapt to emerging challenges such as automation.
    - ii. Enforce laws to formalize informal workers and reduce bonded labour.
  - b. Institutionalization of Best Practices:
    - i. Institutionalize partnerships with international organizations like ILO for sustained technical assistance.
    - ii. Scale up vocational and skill development programs.
  - c. Economic Incentives and Sectoral Development:
    - i. Provide tax incentives to compliant employers.
    - ii. Expand subsidies for welfare contributions, especially targeting SMEs.

#### IV. Case Scenario based Implementation Framework

- a. Conduct raids and free workers trapped in bonded labour under the supervision of law enforcement on urgent basis.
- b. Set up alternate dispute resolution mechanisms to hear cases on an expedited basis of bonded labours.
- c. Build rehabilitation centers providing education, skills training, and psychosocial support to freed labours.
- d. Incorporate anti-bonded labour themes into school curriculums to foster awareness and conduct media campaigns.

#### *Log-Frame*

Objective	Key Activities	Indicators	Timeline	Stakeholders	Resources Required
<b>PLIMS</b>	Develop a centralized database	Digitization of Labour Record	Short Term	Federal Government Provincial Government	Infrastructure and Skill support from existing Federal and Provincial entities. BISP, NADRA, Provincial IT Boards.
<b>Develop a Unified National Labour Policy</b>	Draft and consult stakeholders for a National Labour Policy.	Policy finalized and approved by federal government.	Short Term	MOPHRD Provincial Labour Depts.	Expert consultants, workshops, funding
	Review and align Provincial Labour laws	Number of aligned provincial labour laws.	Medium Term	MOPHRD Provincial Labour Depts.	Legal experts, coordination meetings
<b>Formalize the Informal Sector</b>	Create a digital platform for informal worker registration.	% increase in registered informal workers.	Short Term	Provincial Labour Depts. NGOs	IT infrastructure, training programs
	Launch formalization incentives, including tax breaks/incentives.	Number of formalized small businesses.	Medium Term	FBR Employers Federation	Financial support, advocacy campaigns
<b>Enhance Workplace Safety</b>	Conduct mandatory safety audits in hazardous industries.	Reduction in workplace accidents.	Short Term	Employers Labour Inspectors	Safety equipment, inspection resources
	Align safety standards	Compliance with	Medium	MOPHRD	Technical experts,

	with ILO guidelines and enforce penalties for violations.	safety standards in targeted industries.	Term	Provincial Labour Depts.	monitoring tools
<b>Expand Social Protection</b>	Simplify EOBI registration processes and expand coverage.	% increase in EOBI coverage.	Medium Term	EOBI Employers	Technology upgrades, field campaigns
	Simplify & Digitalize the procedures for availing the WWB and ESSI benefits	Number of labours availing the services	Short Term	Provincial Labour Depts.	Funding Institutional support from Provincial IT Boards
	Introduce universal social protection schemes targeting rural and informal workers.	Number of new beneficiaries under social protection.	Long Term	Provincial Labour Depts. ILO	Funding, social security experts
<b>Promote Gender Equity</b>	Mandate gender-specific workplace initiatives.	% increase in female workforce participation.	Short Term	NGOs Employers	Advocacy and training programs
	Ensure union representation for women and marginalized groups.	% representation of women in unions.	Medium Term	Labour Unions Civil Society	Legal provisions, outreach campaigns
<b>Vocational Training and Skills Development</b>	Partner with industries to establish vocational training centers.	Number of trained workers entering the formal sector.	Medium Term	Industries Vocational Institutes (NAVITC)	Public-private partnership funding
	Introduce technology-enabled dual education systems.	Number of dual-education programs operational.	Long Term	MOFE&PT Provincial Industries Depts.	Digital infrastructure, training modules
<b>Strengthen Governance and Transparency</b>	Digitize fund disbursement and grievance redress mechanisms.	Time reduction in fund disbursement and complaint resolution.	Medium Term	WWF Provincial WWBs	IT systems, training
	Conduct regular audits of welfare fund utilization.	Number of published audit reports.	Long Term	Auditor General of Pakistan	Audit teams, funding
	Translation of Labour Laws in simplified Urdu language	Increase in number of complaints from labours / employers	Short Terms	Provincial Labour Depts.	Legal and Translation Expertise

### *Case Scenario based Log Framework (Micro Level)*

Based on the case scenario (Brick Maker's Case) assessment in the Situational Analysis of the study above, following log frame is being given to propose remedial measures to be implemented as a Short Term Plan to address the issue pertaining to Brick Kiln labours:

Objective	Activities	Outputs	Outcomes	Indicators	Means of Verification	Assumptions/Risks
Objective 1: Enhance enforcement of bonded labour laws.	Train law enforcement, labour inspectors, and judiciary on bonded labour laws and human rights frameworks.	Training sessions conducted for 500 officials within six months in each month.	Improved enforcement of bonded labour laws.	Number of officials trained, number of inspections conducted, reduction in bonded labour cases.	Training reports, attendance records, inspection reports.	Political will for enforcement exists; sufficient training budget allocated.
	Establish expedited trial forums for bonded labour cases in key districts.	At least three trial forums established within six months.	Faster resolution of bonded labour cases.	Number of trial forums established, average case resolution time reduced.	Forum establishment reports, judiciary progress reports.	Judiciary cooperation; availability of judges and resources.
	Conduct regular monitoring of kiln owners and labour contractors through surprise inspections.	Monthly inspections conducted across major kiln clusters.	Improved compliance with labour laws.	Number of inspections, percentage of compliance among kiln owners.	Inspection logs, compliance reports.	Adequate resources for monitoring available; corruption minimized.
	Conduct raids to rescue bonded workers in collaboration with law enforcement.	At least 500 bonded workers freed within six months.	Reduced prevalence of bonded labour in targeted regions.	Number of workers rescued, follow-up reports on rescued individuals.	Raid reports, rescue records, media coverage.	Political and social resistance minimized; safety of workers and officials ensured.
Objective 2: Raise awareness about bonded labour laws and workers' rights.	Launch awareness campaigns targeting brick kiln workers and communities through media and grassroots outreach.	At least 10 media campaigns and 20 community sessions held.	Increased awareness among workers about their legal rights.	Number of campaigns conducted, percentage increase in worker awareness (pre- and post-campaign surveys).	Media coverage, attendance logs, survey results.	Campaigns reach vulnerable workers; sufficient engagement from media and communities.

Objective 3: Support rehabilitation of freed workers.	Set up alternate dispute resolution mechanisms to address labour-related grievances and disputes.	Three dispute resolution centers operational in kiln-dense districts.	Freed workers have access to justice and grievance redress.	Number of disputes resolved, average resolution time.	Center records, case logs, satisfaction surveys from workers.	Dispute resolution mechanisms are accessible and efficient.
	Build temporary rehabilitation centers to provide education, skill training, and psychosocial support to freed workers and their families.	Two rehabilitation centers established, supporting 500 individuals each.	Freed workers reintegrated into society with enhanced livelihood opportunities.	Number of workers supported, types of services provided, number of workers employed after rehabilitation.	Rehabilitation center records, skill training logs, employment statistics.	Sufficient funding and expertise for center operations; coordination with NGOs.
Objective 4: Foster long-term awareness and prevention.	Incorporate anti-bonded labour themes into school curriculums and foster awareness among children.	Curriculum revisions completed, and teaching materials distributed to 200 schools in affected areas.	Improved understanding of bonded labour among youth.	Number of schools implementing curriculum, percentage of students aware of bonded labour issues (post-intervention survey).	Curriculum materials, teacher and student feedback, school reports.	Curriculum changes are approved and implemented on time.
	Conduct media campaigns on the socio-economic impact of bonded labour and the importance of rehabilitation.	At least five nationwide media campaigns aired on TV, radio, and social media platforms.	Greater public awareness about bonded labour and its consequences.	Number of campaigns aired, viewership and engagement metrics, increase in public awareness (survey results).	Media campaign metrics, survey results, online engagement analytics.	Media platforms cooperate; messages reach target audiences effectively.

### *Contingency Plan*

To mitigate implementation delays and ensure continued progress despite economic, political, or administrative challenges, following Contingency Plan is being proposed:

- i. Decentralized Pilot Programs – Initiate smaller-scale pilot projects in highly industrialized regions (e.g., Punjab and Sindh) to demonstrate success and gain broader support.
- ii. Public-Private Partnerships (PPPs) – Engage private sector leaders and international donors to co-fund and co-manage vocational training centers, safety audits, and social protection schemes.

- iii. Incremental Legal Reforms – Prioritize less contentious legal amendments to achieve quick wins while building consensus for more comprehensive reforms.
- iv. Leverage Technology – Use mobile platforms for worker registration and awareness campaigns to bypass bureaucratic inefficiencies.
- v. Stakeholder Advocacy – Build coalitions of trade unions, NGOs, and international organizations to lobby for reforms and provide technical support.

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# Potential and Prospects of Mechanized Agriculture and Smart Agri: Techniques in the Context of Industrial Development in Pakistan

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## Abstract:

This report explores the transformative potential of mechanized agriculture and smart agricultural techniques in addressing Pakistan's agricultural challenges. With agriculture contributing 23% to GDP and employing 38% of the labor force, the sector remains constrained by outdated practices, fragmented policies, and limited access to modern technologies. Historical trends reveal gradual progress from land reforms and the Green Revolution to recent initiatives focusing on climate-resilient and digital agriculture. Analytical frameworks highlight key gaps, including inadequate infrastructure, lack of cohesive policies, and weak stakeholder coordination, while emphasizing opportunities for public-private partnerships, capacity building, and policy reforms. Mechanized and smart agriculture offer significant potential to enhance productivity, sustainability, and industrial development. The proposed actionable recommendations aim to foster collaboration, improve financing, and integrate advanced technologies, ensuring measurable progress through a strategic log frame.

**Key words:** Mechanized Agriculture, Smart Agricultural Techniques, Agricultural Challenges, Policy Reforms and Collaboration, Climate-Resilient Agriculture

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## *Introduction*

Agriculture sector of Pakistan supplements around 23 percent to the GDP of Pakistan, and 37.4 percent towards the labour force of the country. Among the total exports of the country, around 70 percent of exports are directly or indirectly derived from agriculture. About 47 percent of the national land, around 30.5 million hectares, is agricultural land, which is higher than the global average of 38 percent. Two major cropping seasons in Pakistan are Kharif and Rabi, with a total water availability of 72.7 MAF. The irrigation of cultivated land is carried out for more than 82% through irrigation, whereas 18% is through rain-fed methods. In the rain-fed areas, around 60% is used for growing winter season crops, which are barley, wheat, lentils, grams, canola, mustard, and rapeseed, etc. The two major staple crops are wheat and rice, bookkeeping for 37 and 11 percent of the full edit region, respectively. Sugarcane and cotton are the two major cash crops, contributing 09 and 03 percent of the GDP individually (FAO Pakistan, 2025).

Be that as it may, the farming generation is much littler in Pakistan than in other nations of the world. Primary imperatives in expanding rural efficiency are the non-availability of cultivate apparatus to the agriculturists at the right time and at reasonable costs. Cultivate mechanization implies the use of machines and innovation within the farming division. Cultivate mechanization infers the use of mechanical innovation within the shifted cultivating operations, such as sowing, collecting, sifting, leveling, watering, splashing, weeding, and comparable other cultivate operations. The cultivate mechanization incorporates chemical innovation, plant assurance measures, hydrological innovation, and tube wells. Web of things (IOT), mechanical autonomy, manufactured insights, and mechanical innovation, which incorporate tractors and tractor-driven executes, threshers, and bulldozers, hence the use of all said innovative angles are included within the cultivate mechanization. The commitments of agrarian mechanization in various arrange of trim generation can be seen as sparing in seeds 15-20%, sparing in fertilizers 15-20%, sparing in time 20-30%, reduction in labor 20-30%, expanding in trimming escalated 5-20%, and higher efficiency 10-15%. Agribusiness mechanization in Pakistan is restricted to tractorization with cultivator, as it were in Pakistan, due to need of innovation utilization in the agribusiness segment; we face the issue of crops yields crevices. The normal yields generation within the horticulture segment of Pakistan is distant underneath the level of those nations that utilize the innovation in their farming division. The level of yields of different crops is 50-83% lower than the normal of other nations of the world.

The foremost well-known shapes of mechanization in Pakistan are bulldozers, control rigs, tube wells, and tractors with cultivators, wheat threshers, sprayers, and trailers with almost negligible use of smart practices and techniques in the agriculture practices in Pakistan.

### *Problem Statement*

Pakistan's agricultural sector contributes 23% to the GDP and employs 38% of the labor force, yet reliance on traditional farming methods restricts productivity. The lack of mechanization and limited access to smart agricultural technologies are perceived as major barriers to growth and industrial development. Therefore, this research aims to identify the challenges impeding the adoption of mechanized and smart agricultural techniques in Pakistan, explore their potential to enhance productivity, sustainability, and industrial development, and propose policy recommendations to overcome these barriers and drive progress in both agriculture and industry

### *Scope*

This study focuses on analyzing the challenges and opportunities in adopting mechanized and smart agricultural technologies in Pakistan during the period 2020-21 to 2023-24. This study shed light on the traditional farming techniques and practices for its impact on productivity and all such challenges which are acting as an impediment in the way of mechanization and availability as well as adoption of smart practices in the Agriculture sector.

This study also gives an insight a relationship for identifying impact of these technological upgradation with multifaceted aspects like productivity as well as industrial development.

This study, with basic aim of proposing policy-based recommendations which could be practical and of immense importance for the technological based uplift of both agriculture and associated industrial sector.

## ***Research Methodology***

In this research mixed method approach has been employed i-e both qualitative and quantitative methods and has consumed both the primary and secondary data sources. Similarly, analytical techniques like Historical Analysis, Situational Analysis, Institutional Analysis, Legal framework Analysis, SWOT & EETH analysis, Gap Analysis, Stakeholders Analysis etc

### ***Historical Analysis***

#### **Early Post-Independence Era (1947-1960)**

Soon after the independence the biggest challenge was to address the food security and to take steps for the uplift of the agriculture sector which was under threat due to the sudden paradigm shift as a result of partition of subcontinent.

#### **Key Events:**

- In 1959, the government launched a series of land reforms designed to promote social equity by redistributing land among small farmers. This initiative aimed to empower those who had previously been marginalized and to enhance agricultural productivity.
- To further support the agricultural landscape, the establishment of the Agriculture Department was a critical step. This organization was tasked with implementing policies and programs to improve farming practices and assist farmers in their efforts. (Jehangir, 2018)



### ***Green Revolution Era (1960s-1970s)***

In this period of time the focus was further broadened towards those seeds which could give high yields and introducing chemical fertilizers as well as introducing feasible irrigation techniques and methods.

#### **Key Events:**

- Launch of the Green Revolution with the support of international organizations.
- Expansion of irrigation systems (e.g., Tarbela Dam). (EVENSON, 2005)

### ***Mechanization and Institutional Support for Agriculture (1980-1990s)***

Focus on improving productivity through mechanization and introducing modern farming techniques through Agriculture development programs. (FAO, 2022)

#### **Key Events:**

- Agricultural Development Programs like Command Area Development programs, Integrated rural Development Programs, tractor financing schemes etc.
- Institutional Support: Establishment of various agricultural research institutions to support mechanization and training etc

### ***Mechanization and Institutional Support for Agriculture (1990-2000s)***

In this era focus was on financial assistance, empowering women and biotechnology promotion

#### **Key Events:**

- Financial Assistance: Programs to provide loans and grants to small farmers for purchasing machinery and technology.
- Empowerment of Women: Initiatives focused on improving the role of women in agriculture through training and access to resources.
- Biotechnology Promotion: Encouragement of biotechnological advancements in agriculture.

### ***Modernization and Globalization Era (2000s-2010s)***

Focus on sustainable practices, biotechnology, and global market integration.

#### **Key Events:**

- Implementation of the National Agriculture Policy in 2009.
- Emphasis on organic farming and environmental sustainability. (Zubair, 2010)

### ***Recent Developments (2020-Present)***

Challenges from climate change and a need for technological advancement in agriculture.

#### **Key Events:**

- Launch of initiatives for climate-resilient agriculture.
- Growing emphasis on digital agriculture and agri-tech startups. (Khan, 2021), (Bhatti, 2022)

## *Situational Analysis*

Here in this section situational analysis has been covered in different aspects like mechanization impacts on enhancing yield, potential of smart agri techniques, prospects, competitiveness and contribution as follows;

### *Mechanization in Agriculture: Enhancing Yield and Sustainability*

Mechanization in agriculture has become a vital component for enhancing yield production and sustainability in Pakistan's agribusiness. The use of mechanization, such as tractors, harvesters, and tube wells, has somehow allowed the farmers to move away from traditional labor-intensive methods toward more efficient cultivation practices. However, the level of mechanization as well as advance agriculture techniques still varies significantly across regions and farm sizes, reflecting the challenges and opportunities in this field (Ali, 2011).



### *Potential of Mechanized Agriculture and Smart Agriculture Techniques*

In Pakistan, mechanization is more widespread in provinces like **Punjab and Sindh**, where large-scale farming makes the use of machinery such as tractors, harvesters, and tube wells more practical. These mechanized tools are essential for soil preparation, crop transportation, and efficient harvesting, significantly improving productivity and reducing labor costs. However, the adoption of mechanization remains limited in regions like **Khyber Pakhtunkhwa (KP) and Baluchistan**, where smaller, fragmented landholdings and resource constraints hinder the uptake of such technologies (Pakistan Bureau of Statistics, 2021).





Alongside mechanization, **smart agriculture techniques** are gaining attention as innovative solutions to address the challenges faced by the sector. Although still in its early stages, smart agriculture practices—such as **precision farming**, **drones for monitoring crops**, **IoT-based soil sensors**, and **satellite imagery** are beginning to be implemented in select regions, primarily on **5% of agricultural land** (Ministry of National Food Security and Research, 2020). These technologies enable farmers to make data-driven decisions, optimize resource use, and monitor crop health more effectively. As these technologies continue to evolve, their integration into Pakistan's agricultural landscape holds significant potential for improving yields, reducing input costs, and promoting sustainability across the sector (Zafar et al., 2022).



### *Preparedness for Mechanized Agriculture and Smart Agri Techniques*

To promote mechanization in the agriculture sector, the government has launched various initiatives for the adoption of advanced approaches. The **Special Investment Facilitation Council (SIFC)** has undertaken significant initiatives to modernize Pakistan's agricultural sector, focusing on both **mechanized** and **smart agriculture** practices.



A notable endeavor is the **Green Pakistan Initiative**, which aims to enhance agricultural productivity through the adoption of **precision agriculture** techniques. This initiative seeks to improve crop yields

by utilizing advanced technologies, thereby reducing labor time and ensuring efficient management of fertilizers and irrigation processes. The overarching goals include eliminating malnutrition, reducing food imports, and increasing exports. (Pakistan, 2024)

In addition to the Green Pakistan Initiative, SIFC has launched the **Land Information and Management System (LIMS)**, a

comprehensive project designed to revolutionize agriculture through modern techniques. LIMS consolidates data on land, crops, weather, water resources, and pest control, providing farmers with real-time information to make informed decisions. This integrated approach leverages modern technology on underutilized and low-yielding agricultural lands, aiming to attract significant foreign investment and enhance food security. (Malik, 2024)

### *Competitiveness of Mechanized Agriculture and Smart Agriculture Techniques*

Pakistan is significantly behind in the **competitiveness of mechanized and smart agriculture** techniques when compared to other nations. While large-scale farms in Punjab and Sindh have increasingly adopted mechanized tools like tractors, harvesters, and irrigation systems, many smaller farms, especially in Khyber Pakhtunkhwa and Baluchistan, continue to rely on traditional farming methods due to financial constraints and fragmented landholdings. **Smart agriculture** techniques, including **precision farming** and **IoT-based tools**, are still in the early stages of adoption in Pakistan, with limited use mainly by larger, resource-rich farms. Despite the potential of these technologies to optimize resource use and boost productivity, the country lags in integrating these innovations on a broader scale due to high upfront costs, lack of technical expertise, and limited infrastructure. However, there is a strong desire among farmers and policymakers to enhance agricultural productivity and competitiveness. This desire to be more successful has driven initiatives like government subsidies, private sector investments, and public-private partnerships aimed at bridging the technology gap. For Pakistan to catch up and become more competitive, significant investment in technology, infrastructure, and farmer education is essential (Ministry of National Food Security and Research, 2020; Zafar et al., 2022).

## *Contributions of Mechanized Agriculture and Smart Agri Techniques*

Mechanized and smart agriculture techniques offer significant contributions to Pakistan's agricultural sector by improving efficiency, productivity, and sustainability. Mechanization, including tractors and harvesters, reduces labor costs and boosts crop yield, particularly in large-scale farms. Meanwhile, **smart agriculture** technologies like **precision farming**, **drones**, and **IoT solutions** help optimize resource use, reduce waste, and increase productivity through real-time data on soil health and crop performance. Few Government initiatives and private sector investments are supporting the adoption of these technologies, paving the way for improved food security, better livelihoods for farmers, and increased competitiveness in global markets (Zafar et al., 2022; Ministry of National Food Security and Research, 2020).

### **Legal Framework Analysis**

These are the policies, rules and regulations etc. which are directly or indirectly related to the agriculture sector but upon vetting it has been learnt that there is no specific mention of the mechanization or adoption of smart agriculture techniques, with exception to the National Food Security Policy 2018, in very few policies there is only mention of technological advancement and innovation, which, if checked on the ground, haven't been able to yield projectable results or path towards the mechanization as well as adoption of smart techniques in the agriculture sector. Further, none of them are stressing on end to end mechanization and smart agriculture techniques. Few policies of the government have been given as under;

1. **National Food Security Policy 2018:** This policy aims to make sure everyone has enough food. It outlines ways to achieve this, like improving farming, keeping food prices stable, and providing support for those in need. In this policy there is mention of mechanization in section 6.1.1 with an attempt to cover the broader area of mechanization but it has not been focusing explicitly on the aspect of smart agriculture

techniques, rather it focuses on adoption of the climate smart technology.

2. **Pakistan Agricultural Research Council (PARC) Ordinance, 1981:** is a law that established PARC as a premier research organization in Pakistan.
3. **Seed Law 1976:** This law ensures that farmers can buy good quality and certified seeds.
4. **Pesticide Ordinance 1971:** This law controls the import, production, sale, and use of pesticides to ensure they are safe.
5. **Food Safety Laws:** Various laws, including the Pure Food Ordinance 1960, set standards for how food is made and sold to protect people from unsafe food.
6. **Water Laws:** Laws related to water management are key to ensuring that farmers have proper access to water.
7. **Environmental Laws:** These laws aim to protect the environment, covering issues like land use and water quality to promote sustainable farming.
8. **Punjab Agriculture Policy 2018:** This policy highlights the need to modernize and improve farming methods in Pakistan.
9. **Seed Amendment Act 2015:** This act allows for the registration and regulation of high-yield, disease-resistant seeds for better farming.
10. **Punjab Agriculture Marketing Regulatory Authority Act 2018:** This act oversees how farm products are sold in Punjab, helping to adopt better farming techniques.
11. **Sindh Agriculture Market Regulatory Authority Act 2019:** Similar to the Punjab act, this law manages the marketing of farm products in Sindh.

12. **Sindh Agriculture Policy 2018-2030:** Primarily focuses on land tax and agricultural income tax amendments, rather than directly addressing agricultural techniques or mechanization.
13. **Khyber Pakhtunkhwa Agricultural and Livestock Produce Markets Act, 2007.** This Act more focusing on to regulate the purchase and sale of agricultural and livestock produce, ensuring fair practices and efficient market operations.
14. **KP Agriculture Policy 2015-2025:** In this policy it is mentioned too that the government will create laws, support partnerships, and promote farm mechanization suited to local needs. It will provide financial and technical help to scale innovations, strengthen supply chains, and build private sector capacity for modern farming.
15. **Baluchistan Agricultural Produce Markets Act, 1991:** This Act is designed to better regulate the purchase and sale of agricultural produce and to establish markets for such produce within the province.
16. **Baluchistan Agriculture Sector Policy and Strategy:** The focus seems to be on water resource management, value addition to crops, and enhancing market linkages, along with promoting collaboration among stakeholders.

## Institutional Analysis

Key institutions of the government sector involved in agricultural mechanization which include the Ministry of National Food Security and Research (MNFS&R), provincial agriculture departments, research organizations, and local manufacturers. However, these entities often operate in silos, resulting in inefficiencies and duplication of efforts. Strengthening coordination and fostering collaboration between these stakeholders are critical for achieving policy goals.

The organizations dealing with the issues related to the agricultural sector in Pakistan which includes;

1. **Ministry of National Food Security & Research:** Responsible for formulating policies and strategies for agricultural development.
- **Fault line 1:** Slow implementation of agricultural policies and strategies at the grassroots level. (*Food Security Report*, Ministry of National Food Security & Research, 2023)

Example: The delayed implementation of the National Water Policy 2018 has resulted in underperformance of irrigation systems at the grassroots level, affecting small-scale farmers.

- **Fault line 2:** Lack of coordination between federal and provincial agricultural departments, affecting unified policy execution. (*Agricultural Policy and Governance in Pakistan*, Pakistan Institute of Development Economics, 2022.)

Example: Disjointed efforts between the Ministry of National Food Security & Research and provincial agriculture departments led to ineffective implementation of the *Crops Insurance Scheme* in various provinces.

2. **Special Investment Facilitation Centre:** Drives the advancement of mechanized and smart agriculture in Pakistan by facilitating investments, providing policy support, and developing critical infrastructure like high-efficiency irrigation systems.

- **Fault line 1:** Inadequate follow-up on investments due to bureaucratic delays.

Reference: (Asian Development Bank, 2023)

Example: Despite SIFC's efforts to attract foreign investments for smart irrigation systems, delays in project approvals have postponed the roll-out of efficient irrigation systems in Punjab.

- **Fault line 2:** Insufficient focus on the promotion of local agricultural technology innovations in investment schemes. (World Bank, 2023.)

Example: SIFC's lack of emphasis on local startups has led to an over-reliance on foreign agricultural technology, leaving domestic innovations underfunded.

3. **Research and Development institutions, mainly Agricultural & Biological Engineering Institute (ABEI), NARC, Islamabad under Pakistan Agricultural Research Council (PARC) at Federal level:** Conducts research and development in agriculture, including mechanization and smart agri techniques.

- Fault line 1: Limited collaboration between R&D institutions and the private sector, slowing commercialization of innovations. Reference: "The Role of Agricultural Research and Development in Pakistan," *Pakistan Agricultural Research Council*, 2023.

Example: Despite developing innovative mechanized machinery, R&D institutions struggle to partner with manufacturers for large-scale production, limiting the impact of these innovations.

- Fault line 2: Inconsistent funding for long-term research projects, leading to disrupted development cycles. (Agricultural Economics Review, 2023)
- Example: The Bio-engineered Crop Development Project faced funding cuts, resulting in the delay of research on drought-resistant crops.

4. **Agricultural Mechanization Research Institute (AMRI), Multan under Government of Punjab:** Conducting research on agricultural mechanization and technology, developing and testing new agricultural machinery and equipment and improving existing agricultural machinery and equipment.

**Fault line 1:** Lack of sufficient testing facilities for new machinery prototypes under local environmental conditions.  
Reference: (Assessment of Agricultural Mechanization in Punjab," Journal of Agricultural Engineering, 2022)

Example: AMRI faced challenges testing the newly developed rice harvester prototypes in various terrains of Punjab, affecting their commercial viability.

**Fault line 2:** Limited interaction with farmers to understand real-time needs and challenges for developing effective machinery. (International Journal of Agricultural Sustainability, 2023)



Example: The lack of farmer feedback during the testing of a new plowing machine led to low adoption rates, as it failed to meet local farming conditions.

**5. Agricultural Mechanization Research Cell (AMRC) Tandojam under Government of Sindh:** Conducting Research and Development, Testing and Evaluation, Training and Extension, Technology Transfer, Collaboration and Partnerships

- Fault line 1: Inadequate infrastructure for large-scale testing and implementation of new technologies. (Agricultural Technology Adoption and Extension in Sindh, Sindh Agriculture University Journal, 2023)

Example: AMRC struggled to set up adequate testing sites for a newly developed irrigation system in Sindh's varied soil types, delaying the technology's adoption.

- Fault line 2: Insufficient outreach and training programs for small-scale farmers to adopt mechanized solutions. (Challenges in Agricultural Mechanization: A Sindh Perspective," International Food Policy Research Institute, 2023)

Example: The lack of sufficient extension services led to limited adoption of the tractor-based tilling equipment among smallholder farmers in Sindh.

**6. Centre for Agricultural Machinery Industries, Mian Channun under Government of Punjab:** Design and Development, Manufacturing and Fabrication, Training and Capacity Building and Promotion and Marketing

- Fault line 1: Limited financial support for local manufacturers to scale production of high-quality agricultural machinery. (Challenges in Agricultural Machinery Manufacturing in Pakistan, Punjab Industrial Development Board, 2023)

Example: Local manufacturers faced challenges scaling up production of seeders due to a lack of affordable credit from financial institutions.

- Fault line 2: Challenges in maintaining quality standards and competitiveness against imported machinery. (The Impact of Imported Agricultural Machinery on Local Industries," Pakistan Bureau of Statistics, 2023)

Example: Locally produced tractors faced stiff competition from cheaper imported models, leading to a loss of market share for domestic manufacturers.

**7. Agricultural Light Engineering Program (ALEP), Mardan:** under Government of Khyber Pakhtunkhwa; agricultural machinery manufacturers, Collaboration and Partnerships, Promotion and Dissemination, Training and Capacity Building etc

- Fault line 1: Limited capacity to meet growing demand for training and capacity building in the agricultural machinery sector. (Agricultural Mechanization and Capacity Building in Khyber Pakhtunkhwa," Government of Khyber Pakhtunkhwa Annual Report, 2023)

Example: ALEP was unable to cater to the growing demand for training on mechanization due to insufficient training facilities and instructors.

- Fault line 2: Inadequate market access for locally produced agricultural machinery to reach a wider national audience. (Market Access for Agricultural Machinery in Pakistan," Khyber Pakhtunkhwa Investment Promotion Agency, 2023)

Example: Locally manufactured planting equipment faced barriers in accessing larger regional markets due to inadequate marketing and distribution networks.

8. **Financial institutions;** Federal and Provincial autonomous bodies; provincial directorates of agricultural engineering; and, agro-services providers

- Fault line 1: Difficulty in securing low-interest loans for small and medium-sized farmers to invest in modern machinery. (Agricultural Credit and Financing in Pakistan," State Bank of Pakistan Report, 2023)

Example: Small farmers in rural Punjab were unable to access financing options for modern tractors, limiting their ability to increase productivity.

- Fault line 2: Lack of awareness about available financial products tailored to agriculture-focused investments. (Financing Options for Agricultural Investments in Pakistan," National Bank of Pakistan Report, 2023)

Example: Many farmers were unaware of government-backed agricultural loan schemes, missing out on financial opportunities for mechanization.

9. **Academia:** Higher Education Commission; Pakistan Engineering Council; University of Arid Agriculture, Rawalpindi; Sindh Agriculture University, Tandojam

- Fault lines 1: Limited integration of practical field experiences into the academic curriculum for agricultural engineering students. Reference: "Improving Agricultural Engineering Education in Pakistan," *Higher Education Commission Report*, 2023.

Example: Agriculture students at the University of Arid Agriculture struggled to find internships with active farming operations, limiting their real-world exposure.

- Fault line 2: Insufficient research funding for innovative agricultural technologies, limiting academic contributions to the sector. (Trends in Agricultural Research Funding in Pakistan," *Higher Education Commission Report*, 2023)

Example: The Precision Agriculture Research Project at Sindh Agriculture University was delayed multiple times due to lack of dedicated research funding.

## **Stakeholder Analysis**

There is immense potential for adoption of mechanized agriculture and smart agricultural techniques in Pakistan for enhancing productivity, sustainability, and industrial development. However, the success of this transition depends on the active involvement and alignment of key stakeholders, including the government, research institutions, farmers, the private sector, and financial institutions. A thorough stakeholder analysis helps identify the roles, interests, and challenges faced by these entities, particularly in the context of promoting industrial growth through modernized agriculture. Addressing these fault lines is critical to leveraging agricultural innovation as a catalyst for economic transformation in Pakistan.

### ***Government:***

Policy-makers, regulatory bodies, and public institutions that can support or hinder the adoption of mechanized agriculture and smart agri techniques through policies, subsidies, and infrastructure development.

- **Policy Disconnect:** Government policies often prioritize the needs of large-scale farmers over smallholders, leaving many rural farmers without adequate support. (Ali, 2020)
- **Lack of Infrastructure Investment:** Insufficient government investment in rural infrastructure, such as roads and storage facilities, hampers the adoption of mechanized agriculture in remote areas. (Bashir, 2021)
- **Uncontrolled Sprawl of Housing schemes:** Now it's a trend of housing schemes on the cultivable land all over the country and this sprawl is increasing day by day which is drastically decreasing the availability of cultivation for cultivation and there is no strict control of the government to protect. (Dawn. (2023).

- Threats to Pakistan's food security from farmland conversion. Retrieved from <https://www.dawn.com>)

### ***Research Institutions:***

Universities, research centers, and organizations that develop and test new agricultural technologies and techniques.

- **Fault line: Technology Relevance:** Research institutions may develop agricultural technologies that are not well-suited to Pakistan's diverse climates, crop types, or local farming practices. This mismatch reduces the chances of successful implementation on the ground.
- **Example:** In 2019, the Pakistan Agricultural Research Council (PARC) introduced a variety of drought-resistant wheat. However, the variety performed poorly in certain regions of Sindh due to the soil conditions, limiting its adoption by farmers. (Iqbal, 2019)
- **Fault line: Slow Adoption of Research Innovations:** There is often a delay in the adoption of innovations from research institutions by farmers. Lack of awareness, training, and trust in new technologies hinders this transition from research to real-world application.
- **Example:** The slow uptake of precision farming technologies, such as soil moisture sensors, is a result of insufficient training programs for farmers, despite their demonstrated effectiveness in improving water use efficiency. (Zaman, 2021)

*Farmers:*

Beneficiaries of mechanized agriculture and smart agri techniques, which can increase efficiency, reduce labor costs, and improve crop yields.

- **Fault line: High Initial Costs**
- **Explanation:** The initial investment required to adopt mechanized equipment and smart technologies is often too high for smallholder farmers, limiting their ability to access such innovations.
- **Example:** In Punjab, smallholder farmers have expressed concerns over the high upfront cost of acquiring modern machinery such as combine harvesters, which can cost upwards of PKR 1.5 million. This price point is prohibitive for many. (World Bank, 2020)
- **Fault line: Lack of Training and Knowledge:**
- **Explanation:** Farmers often lack the necessary skills and knowledge to operate modern farming equipment, leading to inefficient use of available technologies and machinery.
- **Example:** In Khyber Pakhtunkhwa, farmers who received subsidized drones for crop monitoring found them difficult to use due to inadequate training programs, leading to underutilization of the technology. (Garforth, 2021)
- **Fault line Lack of Farmer Associations:** The absence of strong farmer associations limits farmers' ability to collectively advocate for their needs, access resources, or negotiate better prices for inputs and equipment.

- **Explanation:** Without a unified platform, farmers are often unable to benefit from economies of scale, lobbying for favorable policies, or collective bargaining with suppliers of seeds, machinery, or credit. The fragmentation of farmers' interests makes it difficult to implement policies that address the real issues faced by smallholder farmers.
- **Example:** In the absence of farmer associations, many farmers in Sindh and Baluchistan have struggled to negotiate fair prices for their produce, leading to exploitation by middlemen who offer low rates. This further limits their access to resources like subsidized machinery or training. (Shah, Hussain, 2022)

### *Private Sector*

Companies that manufacture and supply agricultural machinery, technology providers, and input suppliers (e.g., seeds, fertilizers, pesticides).

- **Private Sector: Fault line: Over-Regulation by Government**
- **Explanation:** Over-regulation by the government can create barriers for the private sector in terms of innovation and the development of new agricultural technologies and machinery. Strict rules may lead to delays in introducing new products to the market.



- **Example:** The introduction of precision farming tools such as soil sensors and automated irrigation systems has been delayed in Pakistan due to government approval processes and the lengthy registration of new technologies. (Sullivan, 2021).
- **Fault line: Market Access for Smallholders:** The private sector often prioritizes larger farms with better purchasing power, leaving smallholder farmers with limited access to high-quality machinery and agri-tech solutions.
- **Example:** Companies that manufacture high-tech irrigation systems and smart tractors often focus on larger commercial farms, such as those in Punjab, while smallholder farmers in remote areas face barriers to accessing these technologies. (Patel, 2020)

#### *Financial Institutions:*

Banks, microfinance organizations, and other financial institutions that provide loans and other financial services to farmers and agricultural businesses.

- **Fault line: Reluctance to Offer Loans:** Financial institutions are often hesitant to provide loans to farmers for purchasing machinery or adopting smart agri-tech due to the perceived high risk of investment in agriculture.
- **Explanation: Example:** In 2020, despite government initiatives to provide subsidized loans to farmers, many smallholders in Sindh struggled to secure financing for purchasing mechanized equipment due to banks' stringent lending policies. (Bock, 2022)

- **Fault line: Unfavorable Loan Terms:** Even when loans are available, the terms are often not favorable for smallholder farmers, with high-interest rates or strict repayment conditions that discourage borrowing for mechanization.
- **Example:** In the 2019 Punjab Tractor Scheme, farmers faced repayment terms that were difficult to meet, especially during drought years when crop yields were low, thus deterring them from adopting mechanized solutions. (Ruthenberg, 2021)

### Comparative Analysis



Israel has been chosen for comparison with Pakistan in agricultural mechanization and smart farming techniques due to its remarkable advancements in overcoming resource constraints. Despite having arid conditions and limited

arable land, Israel has emerged as a global leader in innovative agricultural practices, leveraging technology to achieve exceptional productivity and sustainability. This makes Israel an ideal benchmark for exploring how modern mechanization and smart farming methods can address challenges such as water scarcity, labor efficiency, and crop yield enhancement issues that Pakistan also faces. By understanding Israel's best practices, valuable insights can be gained to modernize Pakistan's agriculture sector and unlock its potential.



Difference of mechanized and smart agriculture practices between Pakistan and Israel has been given in the following table on different steps; (Security, 2025), (FAO, 2022), (Waggoner, J. D., & Shklar, A.2023).

Step	Machines Used in Pakistan for Wheat	Machines Used in Pakistan for Rice	Best Practices in Israel for Wheat	Best Practices in Israel for Rice
<b>1. Land Preparation</b>	Tractors & Tine Cultivators	Tractors and Rotary Tiller Cultivator	GPS-guided Tractors, Conservation Tillage, Rotary Cultivators	
<b>2. Sowing</b>	Seed Drills (Cedar, Disc)	Rice Transplanters (Kubota)	High-Efficiency Seed Drills, No-Till Planting (Zero tillage)	Smart Sowing Systems (Drones), Precision Seeders
<b>3. Watering</b>	Water Pumps (Diesel, Submersible), Sprinkler Systems (Center Pivot)	Water Pumps (Diesel, Submersible), Flood Irrigation	Drip Irrigation, Smart Water Management, Automated Irrigation Systems	Automated irrigation system to optimize soil moisture
<b>4. Weeding</b>	Weeding Tools (Manual, Power Weeders)	Power Weeders (Rotary, Walk-Behind), Manual Weeders	Autonomous Weeding Robots, Cover Crops, Biological Pest Control	
<b>5. Fertilization</b>	Fertilizer Spreaders (Broadcast, Pendulum)	Fertilizer Spreaders (Granular), Fertilizer Injectors	Variable Rate Fertilizer, Fertigation, Controlled-Release Fertilizers	
<b>6. Pest and Disease Control</b>	Hand Sprayers, Aerial Sprayers (Drones)	Aerial Sprayers (UAVs, Drones), Hand Sprayers	Integrated Pest Management (IPM), Biological Pest Control, Smart Pest Monitoring (Drones)	
<b>7. Harvesting</b>	Manual Harvesting (Sickle), Combine Harvesters	Manual Harvesting (Sickle), Combine Muddy Harvesters	Smart Harvesters, Robotic Harvesting, AI-Driven Harvest Timing	Smart Harvesters, Robotic Harvesting, Robotic Combine Harvesters

## **Blavatnik Governance Model**

The Blavatnik Index of Public Administration 2024 evaluates public administration effectiveness across 120 countries, offering actionable insights into areas of strength and weakness. For Pakistan, the Index provides a diagnostic tool to identify governance gaps, compare performance with peers, and guide reforms in critical public service sectors.

### **The Public Administration:**

In public administration, mechanization remains an overlooked priority. By integrating it into institutional strategies and leadership, Pakistan can revolutionize its agriculture sector and modernize public operations. Strengthening policymaking processes with a focus on mechanized farming and modern technologies will be instrumental for progress.

### **Governance:**

The Blavatnik Index emphasizes governance through strategic capacity, collaboration, and innovation. Pakistan needs to improve institutional collaboration and adopt anti-corruption measures to rebuild public trust. Mechanization could serve as a key governance reform, driving agricultural modernization and sustainable growth. Incorporating data-driven governance, regulatory frameworks for mechanization, and smart agriculture policies are critical to ensuring effective oversight and resource allocation.

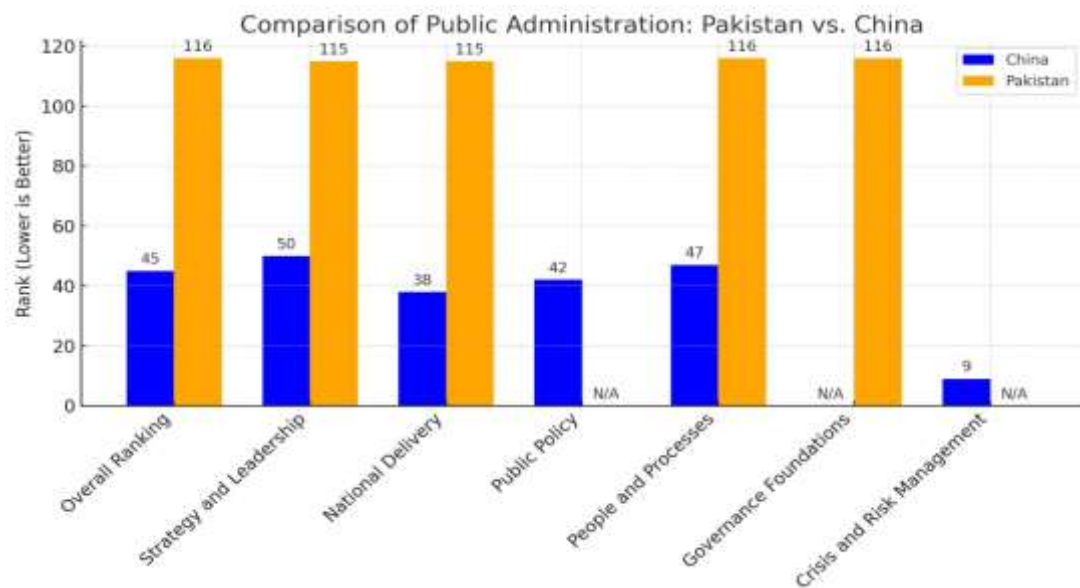
### **Service Delivery:**

Modernizing service delivery is essential for Pakistan's development. Mechanization efforts should focus on timely delivery of subsidized machinery, enhanced digital platforms for farmers, and improved access to resources for mechanized farming. Tax system reforms, efficient social welfare programs like BISP, and workplace technologies can support the integration of mechanization into Pakistan's agricultural and public service sectors, improving overall productivity and efficiency.

Here is a tabulated comparison of **Pakistan** and **China** based on the **Blavatnik Index of Public Administration 2024**. Each aspect includes a reference to support the data.

Aspect	China	Pakistan
Overall Ranking	45 <sup>th</sup>	116 <sup>th</sup>
Strategy and Leadership	Ranked 50 <sup>th</sup>	Ranked 115 <sup>th</sup>
National Delivery	Ranked 38 <sup>th</sup>	Ranked 115 <sup>th</sup>
Public Policy	Ranked 42 <sup>nd</sup>	Not explicitly ranked
People and Processes	Ranked 47 <sup>th</sup>	Ranked 116 <sup>th</sup>
Governance Foundations	Moderately ranked (exact rank not specified)	Ranked 116 <sup>th</sup>
Crisis and Risk Management	Ranked 9 <sup>th</sup> (tied with other countries)	Not ranked in the top tier

For better understanding and illustration, the comparison has been given in the following bar chart



## SWOT Analysis

The Pakistan Agricultural Research Council (PARC) is the leading national organization for agricultural research and development in Pakistan. Established under the PARC Ordinance of 1981, it aims to enhance agricultural productivity, ensure food security, and promote sustainable farming practices. With a network of research centers across the country, PARC addresses region-specific challenges and facilitates the adoption of modern agricultural technologies, playing a crucial role in the advancement of Pakistan's agriculture sector. In this Section SWOT analysis of the (Pakistan Agricultural Research Council Ordinance, 1981 (Ordinance No. XXX of 1981)

Detailed analysis has been given in the following table;

Aspect	Details
<b>Strengths</b>	<ol style="list-style-type: none"> <li><b>1. Established Mandate:</b> The PARC serves as the central authority for agriculture, food security, and allied sectors.</li> <li><b>2. Legal and Institutional Framework:</b> Pakistan Agriculture Research Council (PARC) Ordinance 1981 that governs the activities of PARC, aiming to coordinate and promote agricultural research in Pakistan. It ensures the development, dissemination, and adoption of new agricultural technologies to improve productivity and sustainability in the sector.</li> <li><b>3. Crisis Management Capability:</b> Coordinates responses to food security issues during emergencies such as floods and droughts.</li> <li><b>4. International Engagement:</b> Strong collaboration with organizations like FAO, WFP, and donors for funding and technical assistance.</li> </ol>
<b>Weaknesses</b>	<ol style="list-style-type: none"> <li><b>1. Lack of Strategic Vision:</b> The PARC is not consistently focused on long-term strategies for modernizing agriculture.</li> <li><b>2. Policy Implementation Gaps:</b> Weak execution due to inadequate resources and interprovincial coordination.</li> <li><b>3. Fragmented Legal Framework:</b> Overlaps and inconsistencies between federal and provincial laws after the 18th Amendment and it has failed in developing synergy and harmony in this context among the federation and provinces.</li> </ol>

	<p>4. <b>Limited Technological Expertise:</b> Insufficient adoption of modern technologies in operations and policy enforcement.</p> <p>5. <b>Weak Institutional Capacity:</b> Limited trained personnel and lack of advanced technical resources to support modern agriculture.</p> <p>6. <b>Un-Utilization of Imported Machinery:</b> PARC has received state of the art agriculture machinery costing Rs. 1139 million from China and still no utilization. (List of machinery is attached as Annexure-A)</p>
<b>Opportunities</b>	<p>1. <b>Policy Reforms:</b> Opportunity to align policies with modern agricultural practices and international standards.</p> <p>2. <b>Digital Transformation:</b> Scope for adopting technology such as GIS, precision agriculture, and data analytics for policy monitoring and implementation.</p> <p>3. <b>Private Sector Collaboration:</b> Potential for fostering Public-Private Partnerships (PPPs) to enhance agricultural infrastructure and practices.</p> <p>4. <b>Global Climate Initiatives:</b> Access to funding and expertise under climate-focused programs and agreements such as SDGs.</p> <p>5. <b>Capacity Building:</b> Training programs to develop expertise in climate-smart agriculture and mechanization techniques.</p>
<b>Threats</b>	<p>1. <b>Political Instability:</b> Frequent changes in leadership and policy priorities disrupt continuity.</p> <p>2. <b>Limited Funding:</b> Insufficient government funding and financial constraints can hinder the council's capacity to undertake large-scale research and development projects in the agricultural sector.</p> <p>3. <b>Lack of Infrastructure:</b> Inadequate infrastructure, including research facilities and modern technologies, can impede the effective implementation of agricultural innovations and research programs.</p>

## EETH Analysis

Category	Actionable Points
<b>Enhance</b>	Develop and implement a <b>National Smart Agriculture Policy</b> to drive innovation and modernization.
	Expand training programs and research for IoT-based monitoring, AI-driven data analysis, and drone technology.
	Strengthen international partnerships (e.g., FAO, WFP) for funding and technical expertise in smart agriculture.
	Establish robust monitoring mechanisms for assessing the adoption and impact of mechanized and smart agriculture practices.
<b>Eliminate</b>	Address the <b>absence of a National Smart Agriculture Policy</b> by prioritizing its formulation and adoption.
	Streamline resource allocation and interprovincial coordination to close policy implementation gaps.
	Reconcile inconsistencies between federal and provincial policies to support smart agriculture.
	Strengthen institutional capacity by recruiting and training professionals in smart agriculture technologies.
<b>Take Advantage</b>	Use the policy gap as an opportunity to establish PARC as a leader in developing a <b>Smart Agriculture Policy</b> .
	Leverage technological tools like GIS, AI, and data analytics for policy monitoring and implementation.
	Foster partnerships with the private sector to expand access to smart agriculture technologies.
	Capitalize on climate-focused funding and international programs to introduce adaptive and resilient agricultural practices.
	Organize farmer training programs to enhance awareness and adoption of smart agriculture techniques.
<b>Hedge Against</b>	Advocate bipartisan support to ensure policy continuity despite political changes.
	Diversify funding sources through international donors, climate funds, and private sector investments.
	Invest in climate-smart agriculture to mitigate the effects of extreme weather and changing climate patterns.
	Upgrade research infrastructure to facilitate the adoption of mechanized and smart agriculture practices.
	Address farmer reluctance by providing subsidies, education, and showcasing the benefits of smart agriculture through pilot projects and success stories.



## **Gap Analysis**

The agriculture sector is the primary source of livelihood in Pakistan. It not only contributes substantially to the country's GDP but also ensures food security and supports related industries, making it a cornerstone of Pakistan's socio-economic framework. However, it faces critical gaps that hinder its progress toward modernization and sustainability. The lack of comprehensive policies, limited access to financing, technological shortcomings, and inadequate infrastructure impede the adoption of mechanized and smart agricultural practices. Conducting a gap analysis is essential to identify these challenges and develop targeted solutions that can enhance productivity, foster industrial development, and ensure long-term food security in the country.

### **Absence of a Comprehensive National Policy**

- There is no integrated national policy addressing mechanization and smart agriculture as a cohesive strategy, leading to fragmented efforts and lack of direction.
- Stakeholder engagement in policy-making remains limited, resulting in policies that fail to address the specific needs of diverse farming systems across Pakistan.

### **Limited Access to Affordable Financing**

- Smallholder farmers struggle to access affordable financial products, such as low-interest loans or leasing options, to invest in machinery and smart agriculture tools.
- Financial institutions lack tailored schemes to address the specific requirements of mechanization and smart technologies, further marginalizing resource-poor farmers.

### **Weak Coordination Between Federal and Provincial Agencies**

- Inadequate collaboration between federal and provincial governments leads to inefficient implementation of mechanization and smart agriculture initiatives.
- No established inter-agency frameworks exist to align efforts, creating overlaps and inefficiencies.

### **Technological Gaps in Mechanization**

- Low penetration of mechanized equipment, particularly among smallholder farmers, due to high costs and lack of accessibility in remote areas.
- Limited availability of locally adapted machinery suitable for Pakistan's diverse agro-climatic regions hinders widespread adoption.

### **Slow Adoption of Smart Agriculture**

- Smart agriculture techniques, such as precision farming, IoT, and drones, are not widely adopted due to limited awareness, high costs, and lack of technical expertise.
- Inadequate infrastructure, such as reliable internet and electricity in rural areas, restricts the implementation of technology-driven solutions.

### **Insufficient Training and Capacity Building**

- Farmers, technicians, and operators lack the necessary skills to effectively use and maintain mechanized and smart agriculture technologies.
- Collaboration between agricultural universities, vocational centers, and private companies is weak, limiting the availability of structured training programs.

### **Lack of Quality Standards for Locally Manufactured Machinery**

- Domestically produced agricultural machinery often does not meet durability and efficiency standards, resulting in lower farmer confidence and reduced adoption.
- Limited certification systems and testing facilities fail to ensure compliance with international standards, weakening competitiveness.

### **Underdeveloped Research and Innovation**

- Research on mechanized and smart agriculture is insufficiently tailored to Pakistan's diverse farming conditions, limiting the relevance of innovations.
- Weak public-private partnerships in research and development result in a lack of cost-effective, scalable technologies for smallholder farmers.

### **Minimal Public-Private Collaboration**

- Public-private partnerships to promote affordable and accessible mechanization and smart agriculture solutions for smallholders are underutilized.
- Private sector engagement in developing and distributing modern machinery and technologies remains limited, leading to high costs and reduced availability.

### **Inadequate Infrastructure for Smart Agriculture**

- Poor rural infrastructure, such as unreliable electricity and internet connectivity, prevents the implementation of IoT and precision farming solutions.
- Lack of data-driven platforms and real-time analytics tools limits farmers' ability to make informed decisions.

## Ineffective Monitoring and Evaluation Mechanisms

- Mechanisms to monitor and evaluate mechanization and smart agriculture programs are weak or non-existent, hindering the assessment of progress and policy effectiveness.
- Insufficient data collection on machinery usage, smart agriculture adoption, and productivity impacts limits evidence-based decision-making.

## Issues and Challenges

### *Lack of Dedicated Policy on Mechanization and Smart Agriculture Techniques:*

**Problem:** Absence of a robust national policy focusing explicitly on mechanization, with current frameworks addressing only specific items like tractors.

**Impact:** Fragmented efforts and lack of direction hinder the widespread adoption of advanced farming technologies.

### *High Costs and Limited Accessibility to Machinery:*

**Problem:** The majority of smallholder farmers cannot afford modern agricultural machinery due to high upfront costs and limited financing options.

**Impact:** Low adoption of mechanization leads to inefficient farming practices and lower yields.

### *Fragmented and Small Landholdings*

**Problem:** Small and fragmented farms make it financially unfeasible to invest in machinery or implement large-scale mechanization solutions.

**Impact:** Limits economies of scale and the efficiency of mechanized tools.

### *Limited Access to Financing*

**Problem:** Small-scale farmers face significant barriers in obtaining affordable loans to purchase agricultural equipment.

**Impact:** Mechanization remains limited to large-scale farmers, widening the productivity gap.

### *Inadequate Capacity Building and Training*

**Problem:** Farmers lack the technical knowledge and skills to use and maintain modern machinery effectively.

**Impact:** Leads to inefficiencies, reduced productivity, and suboptimal use of resources.

### *Poor Coordination among Stakeholders*

**Problem:** Weak collaboration between federal and provincial governments, research institutions, and the private sector.

**Impact:** Reduces the effectiveness of mechanization initiatives and leads to duplication of efforts.

## *Conclusion*

The analysis highlights the need for mechanization and smart agriculture to address Pakistan's low productivity and outdated practices. Bridging policy gaps, fostering collaboration, and adopting advanced technologies are crucial for sustainable growth. Key insights of conclusion is given as under;

The agriculture sector is crucial to Pakistan's economy, contributing significantly to GDP and employment, yet it lags in mechanization and smart agriculture adoption due to fragmented policies, limited infrastructure, and high costs.

Mechanized tools and innovative smart technologies such as IoT and precision farming have immense potential to enhance productivity and sustainability.

The analysis highlights disparities in technology adoption, with large-scale farms benefiting more than smallholders due to financial and resource constraints.

Gaps in institutional coordination and an absence of comprehensive national policies hinder modernization efforts.

Stakeholder collaboration, especially between government, private sector, and research institutions, remains weak, resulting in inefficient implementation and missed opportunities.

Comparative studies emphasize the need for Pakistan to emulate countries like Israel, which have successfully integrated advanced agricultural technologies despite resource limitations.

Legal frameworks and policies addressing mechanization and smart agriculture are insufficient, necessitating reforms to align with global best practices.

SWOT and EETH analyses reveal strategic opportunities in capacity building, public-private partnerships, and leveraging global climate initiatives for funding and expertise.

The integration of modern technologies must be supported through farmer training, infrastructure development, and financial accessibility.

For Pakistan to achieve sustainable growth and industrial development, focused efforts are required to bridge existing gaps, adopt innovation, and ensure equitable resource allocation.

Uncontrolled sprawl of the housing schemes on the agriculture land is alarmingly squeezing the availability of agri land in the country.

### ***Recommendations***

#### ***Policy:***

Agricultural sector is a major contributor to the country's economy. There should be a comprehensive policy for covering all aspects of mechanization and smart agriculture setting aim to modernize farming practices, enhance productivity, and promote sustainable practices.

#### ***Ban on Housing schemes on the Agriculture Land:***

Implement a robust policy both at Federal and Provincial level to protect agricultural land from being converted into housing societies. To achieve this hallmark of safeguarding agricultural land, stringent zoning regulations may be implemented, protecting designated farming zones from real estate development. A specialized task force may be constituted to monitor land usage, ensuring that unauthorized conversions of agricultural areas are quickly detected and stopped. To promote adherence to these rules, landowners who maintain their properties for agricultural use will be provided with financial incentives like tax reductions or subsidies.

Furthermore, national and provincial public awareness initiatives will be introduced to inform the community about the vital significance of conserving agricultural land for food security and sustainable growth.

### ***Usage of Imported Machinery from China:***

The PARC must prioritize the use of the unused machinery imported from China to guarantee optimal resource utilization. This approach can also be implemented through reverse engineering in local industries, particularly in Gujranwala, to create advanced and customized machinery that meets the specific needs of Pakistan.

### ***Public Private Partnership:***

The government should implement a Public-Private Partnership (PPP) program to import advanced agricultural machinery. Under this initiative, machinery will be:

**Subsidized:** Offered at a 20-80% subsidy and the cost of such machinery shall be borne by the govt: and progressive farmers respectively.

**Rental Service:** These machineries made available through rental basis in each district, allowing small farmers to rent equipment at affordable rates.

### ***Development of Curricula:***

Government institutions such as Provincial Agriculture Extension, Agriculture Research, Academia, and NAVTTC will collaboratively design and implement a comprehensive curriculum for training agricultural technicians.

### ***Formers Associations:***

Farmer Associations at the District Level for Mechanized a Smart

Agriculture are critical catalysts in transforming traditional farming systems into advanced, efficient, and sustainable agricultural enterprises.

These associations can drive the widespread adoption of cutting-edge mechanized and smart farming technologies, equip farmers with essential skills and knowledge, and establish a robust network that promotes collaboration, resource-sharing, and greater market access. By empowering farmers with the tools, training, and support they need, these associations can unlock the full potential of modern agriculture, boosting productivity, sustainability, and economic resilience.

*Log Frame*

Goal	Objectives	Activities	Indicators	Costs (PKR)	Responsible Government Departments
Enhance agricultural productivity and sustainability.	Comprehensive policy for mechanization and smart agriculture.	1. Develop policy framework for mechanization and smart agriculture.	Policy document completed and approved.	1,000,000	Ministry of Agriculture
	Protect agricultural land from conversion to housing schemes.	2. Implement zoning regulations and establish a task force for land protection.	Number of unauthorized conversions detected/stopped.	500,000	Ministry of Housing and Urban Development, Provincial Agriculture Departments, Local Governments
		3. Launch public awareness campaigns on the importance of agricultural land conservation.	Community awareness levels (pre- and post-campaign).	1,500,000	Ministry of Information, Ministry of Agriculture
	Promote optimal utilization of imported machinery from China.	4. Assess unused machinery and implement reverse engineering initiatives in local industries.	Number of machinery items optimized/engineered.	2,000,000	Pakistan Agricultural Research Council (PARC)
	Facilitate access to advanced agricultural machinery through PPP.	5. Establish PPP program for importing machinery with subsidies and rental services.	Number of farmers accessing subsidized machinery.	10,000,000	Ministry of Agriculture, Ministry of Finance
		6. Create rental service for machinery in each district.	Utilization rates of rental machinery.	4,000,000	Provincial Agriculture Departments
	Develop comprehensive	7. Collaborate with	Number of trained technicians and	1,000,000	National Vocational



	curricula for training agricultural technicians.	institutions to design and implement training programs.	curricula developed.		and Technical Training Commission (NAVTTTC), Ministry of Education
	Strengthen Farmer Associations for mechanized and smart agriculture.	8. Support the formation and development of farmer associations at the district level.	Number of associations established and active.	2,000,000	Provincial Agriculture Departments, Ministry of Agriculture
			Total Estimated Costs:	PKR 22,000,000	

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# High Tech and Innovative Emerging Industries and Pakistan's Policies and Regulations towards Adaptation in the light of China's Strategies of Reverse Engineering

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## Abstract:

The evolution of innovation dates back to ancient civilizations and continues to shape modern economies through high-tech advancements. Reverse engineering – a process of deconstructing and enhancing technologies – has been instrumental in industrial growth worldwide, notably in countries like China and Japan. Pakistan's potential in leveraging reverse engineering remains underutilized, hindered by outdated infrastructure, inadequate R&D investments, weak institutional frameworks, and fragmented policies. Initiatives like STZs and the Digital Pakistan Policy offer promise but suffer from misaligned execution. This study underscores the transformative potential of reverse engineering in Pakistan's defense, agriculture, pharmaceuticals, and renewable energy sectors. By fostering academia-industry-government collaboration, improving infrastructure, and adopting global best practices, Pakistan can bridge its technological gaps, enhance export competitiveness, and reduce its import dependency. A robust reverse engineering strategy will catalyze innovation, strengthen industrial output, and pave the way for long-term economic sustainability and self-reliance.

**Key words:** Reverse engineering, innovation, economic sustainability, high-tech industries Pakistan

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## *Introduction*

The roots of innovation trace back to ancient civilizations where foundational engineering principles were applied to construct marvels like the pyramids of Egypt and the aqueducts of Rome. These early advancements laid the groundwork for the Industrial Revolution, a period that transformed economies through mechanization, mass production, and global trade. In the modern era, high-tech and innovative industries have taken center stage, driving technological advancement, economic growth, and global competitiveness. A key enabler of this transformation has been reverse engineering, a strategic process of deconstructing technologies to understand, replicate, and enhance them. In many industries, reverse engineering is not only a tool for creating competitive advantages but also an avenue for improving upon existing technologies and creating new solutions that would have been difficult to achieve otherwise.

Reverse engineering has proven to be a game-changer for countries like China and Japan, enabling them to bridge technological gaps and establish dominance in key sectors. China, for example, has leveraged reverse engineering to rapidly develop indigenous capabilities in defense, semiconductors, renewable energy, and telecommunications. Initiatives like "Made in China 2025" have institutionalized reverse engineering as a cornerstone of their industrial strategy, backed by government subsidies, state-sponsored R&D, and technology-sharing agreements (Chow, 2002; National Bureau of Statistics of China, 2024). Chinese firms like LONGi Solar adapted German solar panel designs to lead the global renewable energy market, while the Chengdu Aircraft Corporation reverse-engineered Russian aircraft technologies to develop platforms like the JF-17 Thunder (Rodrik, 2004). These efforts have significantly reduced China's reliance on foreign imports and bolstered its global competitiveness.

Similarly, Japan employed reverse engineering to rebuild its industrial base after World War II. Automakers like Toyota and Nissan studied American manufacturing techniques, introducing innovations such as Kaizen and lean production to outperform their Western counterparts (Watanabe, 1995). In electronics, Sony reverse-engineered U.S. tape recorders, refining the designs to produce superior products that gained global acclaim (Shih, 1996). Supported by the Ministry of International Trade and Industry (MITI), Japan's focus on precision, quality, and incremental innovation transformed it into a technological powerhouse (Kobayashi, 1995).

For Pakistan, reverse engineering holds immense potential to address critical economic and technological challenges. The country's high import

bill, which stood at a staggering \$54.73 billion in FY 2023-24, highlights its heavy dependence on foreign technologies and products.

Sectors such as defense manufacturing, pharmaceuticals, agriculture, renewable energy, IT, textiles, and e-commerce are ripe for transformation through reverse engineering (ProPK Staff, 2024). By localizing production and adapting foreign technologies, Pakistan can reduce its reliance on costly imports, enhance export competitiveness, and drive sustainable economic growth.

Industries like defense and aerospace, spearheaded by institutions such as the Pakistan Aeronautical Complex (PAC) Kamra and the Pakistan Ordnance Factories (POF) Wah, already possess the technical expertise to adopt reverse engineering on a larger scale. The pharmaceutical sector can replicate generic medicines and biosimilars to meet local and international demands (PCSIR, 2022). In agriculture, precision farming tools and hybrid seeds, inspired by Chinese and Japanese models, can revolutionize productivity. Similarly, the renewable energy sector can leverage reverse engineering to localize the production of solar panels and wind turbines, reducing energy import costs (Vox, 2024). The textiles, agricultural machinery, sports, electronics and surgical instruments industries, concentrated in the Golden Triangle region (Sialkot, Faisalabad, Gujranwala), can also benefit from reverse engineering to modernize production techniques and compete globally.

By integrating reverse engineering into its national strategy and fostering collaboration between academia, industry, and government, Pakistan can not only revolutionize its industrial base but also create a robust ecosystem for innovation. Drawing lessons from China and Japan, Pakistan has the opportunity to lay the foundation for long-term economic sustainability, technological self-reliance, and global competitiveness.

The industrial sector is a major contributor to Pakistan's GDP. Large-scale manufacturing is considered the backbone of an economy. However, Pakistan's industrial development has not been very impressive over the last two decades compared to other countries in South Asia. There is no single overarching national policy to steer the process of industrialization. This warrants an in-depth analysis of the industrial sector's performance to evaluate policy gaps and recommend the best policy options in light of regional best practices.

### *Statement of the Problem*

It is a fact that Pakistan's hi-tech and innovative industries are underperforming, despite the country's significant potential of reverse

engineering. While recent initiatives like the "Digital Pakistan Vision" and the establishment of Special Technology Zones Authority (STZA) aim to promote hi-tech industries.

However, there are concerns about the effectiveness of these policies in promoting local industry on the lines of reverse engineering China model. Therefore, this situation necessitates a critical evaluation of Pakistan's industrial landscape, focusing on the potential of reverse engineering to revolutionize local industries in the light of China reverse engineering strategies, reduce import dependence, and foster innovation.

### *Scope*

This study critically analyzes the state of Pakistan's high-tech and innovative industries, focusing on key sectors such as information technology, defense manufacturing, pharmaceuticals, agriculture, renewable energy, and textiles. It evaluates the potential of reverse engineering to localize production, reduce import dependence, and drive innovation while examining Pakistan's legal, institutional, and policy frameworks, including the STZA Act and PCSIR Act, to identify gaps and recommend reforms. Drawing on successful reverse engineering models from China and Japan, the research employs the Blavatnik School of Government's Oxford Index of Public Administration for a comparative GAP analysis, highlighting deficiencies in R&D investment, policy coherence, and industry-academia collaboration. The study proposes actionable strategies to enhance Pakistan's global competitiveness, achieve technological self-reliance, and foster sustainable industrial growth.

### *Research Methodology*

This study employs a mixed-methods approach, combining qualitative and quantitative methods, to analyze Pakistan's hi-tech and innovative industries with a focus on reverse engineering. The qualitative aspect involves case studies and comparative analyses of strategies from China and Japan to identify lessons for Pakistan, emphasizing sectors like IT, defense manufacturing, pharmaceuticals, agriculture, renewable energy, and textiles. Primary data, including interviews with policymakers, industry professionals, and researchers, as well as a field visit to PCSIR Peshawar, is used to assess reverse engineering projects and ongoing R&D activities, complemented by a review of legal and institutional frameworks such as the STZA Act, PCSIR Act, and Digital Pakistan Vision. Quantitative analysis includes evaluating sectoral contributions to GDP, import bills, and export performance through government reports and industry studies. GAP



analysis, guided by the Blavatnik School's Oxford Index, highlights deficiencies in governance and delivery mechanisms, while a SWOT-EETH analysis examines organizations like PCSIR, PAC Kamra, and POF Wah to develop actionable strategies.

The study also integrates situational analysis and draws on primary and secondary data sources to evaluate the state and preparedness of Pakistan's hi-tech industries, offering actionable recommendations to leverage reverse engineering for industrial growth and reduced import dependency.

### *Situational analysis*

#### *Hi-tech and innovative industry of Pakistan*

Pakistan's high-tech and innovative industries encompass sectors such as Information Technology (IT), telecommunications, e-commerce, fintech, renewable energy, pharmaceuticals, textiles, agriculture, and defense manufacturing. A situational analysis of these sectors reveals their current status, capacity, preparedness, and contributions to national economic development.

#### *Current Status*

**IT Sector:** Pakistan's IT industry has experienced significant growth, with IT and IT-enabled services (ITeS) export remittances reaching an all-time high of \$3.223 billion in the fiscal year 2023-24, marking a 24% increase from the previous year (ProPK Staff, 2024). The country is also ranked among the top five freelancing nations globally, reflecting its strong presence in the international IT market (Kashif, 2022).

**Telecommunications:** The sector boasts over 190 million mobile subscribers and 124 million broadband users, contributing to its robustness. In the fiscal year 2023-24, telecommunications revenues amounted to PKR 955 billion, underscoring its significant role in the economy (PO Staff, 2024).

**E-commerce:** The e-commerce market in Pakistan is projected to grow to \$5.91 billion by 2025, driven by platforms like Daraz and increasing consumer trust in digital transactions (Board of Investment). This growth is indicative of the expanding digital economy in the country.

**Fintech:** The digital payments market is expected to reach \$19.34 billion by 2025, with companies like Easypaisa and JazzCash leading efforts in financial inclusion (Board of Investment). Visa has also announced plans to increase digital payment adoption in Pakistan tenfold over the next three years, partnering with local entities to enhance the digital payment infrastructure (Reuters, 2024).

**Pharmaceuticals:** Contributing approximately 1.2% to GDP, the pharmaceutical sector comprises over 750 manufacturing units focusing on generic medicines and exports to more than 50 countries (Pakistan Council of Scientific & Industrial Research [PCSIR], 2022).

The Government established the Cannabis Control and Regulatory Authority (CCRA) to oversee licensing and regulation of both hemp and marijuana sectors to allow commercial cultivation of hemp reflects Pakistan strategic move to tap into the Global Cannabis Market. In this regard, the PCSIR is currently working to find other avenues for its productivity in medicinal and textile sector. However, challenges remain in meeting international compliance standards to expand export potential.

**Textiles and Apparel:** Accounting for 60% of exports and employing about 15 million people, the textile sector is undergoing modernization through automation and digital manufacturing to enhance competitiveness (Pakistan & Gulf Economist, 2022). Despite these efforts, high energy costs and outdated machinery continue to pose challenges.

**Renewable Energy:** Renewable energy sources currently account for over 35% of Pakistan's energy mix, with a national goal to achieve 60% by 2030 (Vox, 2024). Recent developments include significant investments in solar energy, with Pakistan becoming one of the world's largest importers of Chinese solar panels between 2020 and 2023, adding substantial capacity to the national grid (Vox, 2024).

**Defense Manufacturing and Reverse Engineering:** Institutions such as the Pakistan Ordnance Factories (POF) in Wah, Pakistan Aeronautical Complex (PAC) in Kamra, and the National Radio Telecommunication Corporation (NRTC) play pivotal roles in defense production and reverse engineering. PAC Kamra, for instance, has capabilities in reverse engineering and additive manufacturing of aircraft parts, contributing to self-reliance in defense technology (Pakistan Aeronautical Complex, n.d.). Additionally, cities like Sialkot and Gujranwala are known for their industrial expertise, with Sialkot being a hub for manufacturing and exporting sports goods and surgical instruments, often utilizing reverse engineering techniques to enhance product development (Rest of World, 2022).

**Agricultural Base:** Agriculture accounts for 19-20% of GDP and employs 38-40% of the workforce. It underpins key industries, including textiles (cotton) and food processing (wheat, rice, and sugarcane). The industry produces over 50,000 tractors annually, supporting mechanization in agriculture. Companies like Millat Tractors Ltd. (Massey Ferguson) and Al-Ghazi Tractors (New Holland) dominate the market. Tractors and spare parts are exported to Africa, the Middle East, and South Asia, earning valuable foreign exchange.

### *Capacity*

**Human Resources:** Pakistan's youthful population, with 64% under the age of 30, provides a dynamic and adaptable workforce (Kashif, 2022).

The IT sector employs approximately 300,000 professionals, with around 25,000 IT graduates entering the workforce annually (Kashif, 2022). This influx supports the growing demand for skilled labor in the tech industry.

**Infrastructure:** The establishment of Special Technology Zones (STZs) aims to create a conducive environment for technology companies (Board of Investment). These zones offer incentives to attract both local and foreign investments, fostering innovation and economic growth. Additionally, the government has initiated projects to enhance digital infrastructure, including expanding broadband access to underserved areas (Board of Investment).

**Research and Development (R&D):** Investment in R&D remains below 1% of GDP, indicating a need for increased funding to drive innovation (PCSIR, 2022). Strengthening industry-academia collaboration is essential to bridge the gap between research and marketable products (PCSIR, 2022). In the defense sector, organizations like PAC Kamra engage in reverse engineering to develop indigenous capabilities, reducing dependence on foreign technology (Pakistan Aeronautical Complex, n.d.).

### *Preparedness*

**Government Initiatives:** Policies such as the Digital Pakistan Policy and the establishment of the Special Technology Zones Authority (STZA) demonstrate the government's commitment to fostering a technology-driven future (Board of Investment). These initiatives aim to create a thriving digital ecosystem through investment in infrastructure, skills development, and regulatory support (Board of Investment, n.d.). In the defense sector, the government's focus on self-reliance has led to the promotion of reverse engineering practices to develop indigenous defense technologies (Ministry of Defense Production, 2021).

**Cybersecurity and Education:** Efforts are underway to enhance cybersecurity measures and promote STEM education (Board of Investment). Programs like the Presidential Initiative for Artificial Intelligence and Computing (PIAIC) aim to equip the youth with skills in

emerging technologies, preparing them for the evolving job market (Board of Investment, n.d.). Workshops and training sessions, such as the Reverse Engineering 101 Workshop by BSides Pakistan, are being organized to build capacity in specialized fields (CSO Pakistan, 2024).

### *Output and Contribution to National Economic Development*

The national economy benefits significantly from diverse sectors, each contributing to growth and development. The high-tech industry accounts for approximately 1% of GDP, with significant potential for expansion (Pakistan & Gulf Economist, 2022). The IT and freelancing sectors generate substantial foreign exchange and create employment, integrating the country into the global digital economy. The telecommunications industry contributed PKR 335 billion to the national treasury in FY 2023-24, highlighting its role in economic development. Textiles, comprising 60% of exports and employing around 15 million people, remain the backbone of the export economy, while the pharmaceutical sector enhances healthcare access and contributes to export earnings. The e-commerce and fintech industries drive consumer spending, promote financial inclusion, and create jobs, supporting socio-economic progress. Meanwhile, renewable energy now forms over 35% of the energy mix, bolstering energy security and reducing dependence on fossil fuels, in line with global sustainability efforts.

### *Hi-tech and innovative industry of China*

The Hi-tech and innovative industries are pivotal to economic growth, fostering technological advancement, enhancing productivity, and driving global competitiveness. China has established itself as a global leader in this sector through strategic investments, policy initiatives, and infrastructure development. In contrast, Pakistan faces considerable challenges, including limited investment, inadequate infrastructure, and a lack of coherent policy frameworks. This analysis examines China's capacity, preparedness, and output in the hi-tech sector, its impact on economic development, and provides a comparative assessment with Pakistan to highlight critical gaps and growth opportunities.

### *China's Capacity*

**Policy and Investment:** China's commitment to high-tech industries is evident through strong policy support and investment. Fixed-asset investment in high-tech industries increased by 10% in the first three quarters of 2024, with high-tech manufacturing and services growing by 9.4% and 11.4%, respectively (National Bureau of Statistics of China, 2024). Initiatives like "Made in China 2025" and the 14th Five-Year Plan have been instrumental in driving this growth.

**Talent Pool and Infrastructure:** Annually, China produces approximately 1.5 million STEM graduates, ensuring a steady stream of skilled professionals. Innovation hubs like the Guangdong-Hong Kong-Macao Greater Bay Area and Zhongruan lead in research and development. Advanced technologies such as precision farming, AI-driven pest control, and IoT monitoring are widely adopted in agriculture, while the textile sector incorporates IoT, AI, and automation for smart manufacturing.

**Tech Preparedness and Global Standing:** Ranked 11th in the Global Innovation Index 2024, China demonstrates excellence in semiconductor production, achieving 7nm chip technology despite external restrictions. It leads global AI research, contributing 25% of publications in 2023, and has advanced aerospace capabilities, exemplified by the Tiangong Space Station and Chang'e lunar missions.

### *Preparedness*

Comprehensive national policies prioritize the development of artificial intelligence (AI), semiconductors, and green energy to drive innovation and align with broader economic goals. Sustained investment in STEM education ensures a steady supply of skilled professionals to support these critical industries. Additionally, well-funded research centers and specialized industrial clusters provide the infrastructure needed to accelerate technological advancements and scale production, fostering global competitiveness and sustainable growth.

### *Output*

**Industrial Performance:** High-tech manufacturing grew by 8.7% in H1 2024, with notable contributions from new energy vehicles (14%), integrated circuits (11%), and service robots (20%). Agriculture benefits from autonomous machinery, while textiles leverage smart manufacturing for global competitiveness.

**Economic Contribution:** Hi-tech industries contribute 15% to GDP, with exports accounting for 33% of total exports. Manufacturing profits rose by 6.3% year-on-year in Q3 2024 (Global Times, 2024).

**Digital Economy:** Valued at \$7 trillion in 2024, the digital economy contributes over 40% of GDP.

### *Comparison with Pakistan; Capacity*

**Policy and Investment:** Pakistan's investment in high-tech industries is minimal, with R&D expenditure at only 0.3% of GDP. The "Digital Pakistan Vision" lacks alignment with innovation goals.

**Talent Pool and Infrastructure:** STEM graduates make up 25% of the graduate pool, and brain drain exacerbates the talent shortage.

Innovation hubs, like the Islamabad Software Technology Park, are underfunded and limited in scale. Agriculture and textiles rely on outdated technologies with minimal innovation.

**Tech Preparedness and Global Standing:** Ranked 87th in the Global Innovation Index 2024, Pakistan heavily depends on imports for semiconductors and green technologies, with negligible contributions to global AI research or advanced manufacturing.

### *Preparedness*

**Policy Deficiencies:** A significant barrier to the growth of high-tech industries is the lack of long-term strategies and clear direction for their development. Without comprehensive, forward-thinking policies, progress in advancing technological innovation is impeded. This absence of strategic planning limits the ability to cultivate and support high-tech sectors effectively, hindering national progress in the global technology arena.

**Talent Shortage:** There is a critical shortage of skilled professionals in the technology sector, driven by a limited emphasis on STEM (Science, Technology, Engineering, and Mathematics) education. The existing educational framework does not sufficiently foster the development of high-tech talent, and the poor retention of these professionals further exacerbates the problem. As a result, industries are left without the expertise necessary to drive technological innovation and growth.

**Infrastructure Gaps:** The lack of adequate funding and development in research and development (R&D) facilities and industrial setups severely limits the potential for innovation. Underfunded infrastructure results in insufficient resources for scientists, engineers, and innovators to explore new technologies, conduct experiments, and develop breakthrough solutions. This deficiency in infrastructure ultimately restricts the overall progress and competitiveness of high-tech sectors.

**Sectoral Misalignment:** There is a clear misalignment between key sectors, such as agriculture and textiles, and the technological advancements needed to foster high-tech growth. These sectors have not integrated modern technological solutions into their operations, which leaves them less prepared for the demands and opportunities of high-tech industries. The absence of technological integration in these traditional sectors reduces their ability to evolve and grow in alignment with global technological advancements.

### *Output*

**Industrial Performance:** Traditional sectors dominate, with minimal contributions from high-tech industries. Agriculture remains labor-intensive, and the textile industry lacks innovation in high-value segments.

**Economic Contribution:** High-tech industries contribute less than 1% to GDP. Exports are primarily traditional, dominated by textiles and agriculture, reflecting low profitability due to outdated practices.

**Digital Economy:** Valued at \$4 billion, the digital economy contributes less than 1% of GDP, despite initiatives under the China-Pakistan Economic Corridor (CPEC).

### *Reverse Engineering*

Reverse engineering is the process of analyzing a system, product, or object to understand its design, architecture, components, and functionality. This process is often undertaken to reproduce, improve, or integrate the system into other applications. It involves deconstructing a product to discover how it works, identifying potential improvements, or developing similar products without directly copying proprietary designs. Developing nations such as China and Japan have effectively leveraged reverse engineering, technology transfer, and strategic government support to establish competitive industries. Pakistan can adopt similar strategies to accelerate innovation and foster self-reliance and economic development across key sectors.

### *Flowchart of Reverse Engineering Process*

**Step 1:** Identification of the target product or system.

**Step 2:** Disassembly or deconstruction to analyze components.

**Step 3:** Documentation of design, architecture, and functionality.

**Step 4:** Evaluation of findings to identify improvements.

**Step 5:** Development of an improved or compatible system.

**Step 6:** Testing and integration into market or production systems.

## *China's Reverse Engineering Approach*

### *Automotive Sector*

**Strategy:** Joint ventures with foreign automakers (e.g., Volkswagen and GM) allowed firms like BYD and Geely to access advanced technology (Rodrik, 2004).

**Example:** BYD initially reverse-engineered battery technologies and later innovated in electric vehicles.

**Government Role:** Enforced technology-sharing agreements for market access (Chow, 2002).

### *Electronics*

**Strategy:** Leveraged intellectual property via reverse engineering in semiconductors and telecommunications (Shih, 1996).

**Example:** Huawei studied foreign telecom technologies and developed advanced solutions.

**Government Role:** Offered subsidies for R&D and protected local firms from foreign competition (Chow, 2002).

### *Information Technology*

**Strategy:** Promoted domestic giants like Tencent and Alibaba by initially mimicking Western platforms (e.g., Facebook, Amazon) (Chow, 2002).

**Example:** Alibaba reverse-engineered e-commerce solutions for local markets.

**Government Role:** Policies like the Great Firewall shielded local firms from foreign competition (Rodrik, 2004).

### *Pharmaceuticals*

**Strategy:** Reverse-engineered patented drugs to develop generics and biosimilars (Rodrik, 2004).

**Example:** Sinovac used reverse engineering to enter the vaccine market.

**Government Role:** Permitted copying under weak IP laws, transitioning to stricter compliance later (World Bank, 1993).

### *Renewable Energy*

**Strategy:** Reverse-engineered solar panel technologies from German firms, leading to firms like LONGi and Trina Solar dominating the global market (World Bank, 1993).

**Government Role:** Provided low-interest loans and export subsidies (Chow, 2002).

### *Defense and Aerospace*

**Strategy:** Reverse-engineered Russian and U.S. technologies for military sectors (Rodrik, 2004).

**Example:** Chengdu Aircraft Corporation reverse-engineered Soviet aircraft to produce the JF-17 Thunder with Pakistan.



**Government Role:** Directed centralized military R&D with substantial state funding (Shih, 1996).

### *Agriculture*

**Strategy:** Leveraged advanced farming techniques, hybrid seeds, and machinery developed through reverse engineering and collaborations.

**Example:** Yuan Longping High-Tech Agriculture Co. developed hybrid rice varieties to boost yields.

**Government Role:** Invested in research institutions and subsidized precision farming (World Bank, 1993).

## *Japan's Reverse Engineering Approach*

### *Automotive Sector*

**Strategy:** After WWII, Toyota and Nissan reverse-engineered U.S. car models, enhancing efficiency and reliability (Watanabe, 1995).

**Example:** Toyota's Kaizen model originated by analyzing Ford's production methods.

**Government Role:** MITI (Ministry of International Trade and Industry) provided R&D subsidies and policy support (Kobayashi, 1995).

### *Electronics*

**Strategy:** Reverse-engineered Western technologies in consumer electronics (Watanabe, 1995).

**Example:** Sony reverse-engineered U.S. tape recorder technologies.

**Government Role:** Promoted the Quality Control Movement and facilitated research collaborations (Kobayashi, 1995).

### *Information Technology*

**Strategy:** Focused on precision engineering and computing technologies (Watanabe, 1995).

**Example:** Fujitsu reverse-engineered IBM systems to develop localized solutions.

**Government Role:** Sponsored the Fifth Generation Computer Systems Project (Kobayashi, 1995).

### *Pharmaceuticals*

**Strategy:** Replicated and improved Western pharmaceuticals (Shih, 1996).

**Example:** Takeda reverse-engineered insulin production methods.

**Government Role:** Supported pharmaceutical R&D through healthcare reforms (Kobayashi, 1995).

### *Renewable Energy*

**Strategy:** Reverse-engineered renewable technologies, optimizing for local conditions (Watanabe, 1995).

**Example:** Sharp became a leader in solar technology by improving Western designs.

**Government Role:** Subsidized R&D and incentivized innovation (Kobayashi, 1995).

### *Defense and Aerospace*

**Strategy:** Reverse-engineered U.S. defense technologies for dual-use applications (Kobayashi, 1995).

**Example:** Mitsubishi Heavy Industries reverse-engineered fighter jets to develop civilian aircraft like the MRJ.

**Government Role:** Collaborated under security agreements with the U.S. (Watanabe, 1995).

### *Agriculture*

**Strategy:** Mechanization and high-yield crops by studying U.S. agricultural models.

**Example:** Kubota Corporation developed advanced machinery for Japan's small-scale farms.

**Government Role:** Provided R&D subsidies and promoted efficient water usage (Kobayashi, 1995).

### *Lessons for Pakistan*

The automotive sector in Pakistan can achieve significant growth by establishing joint ventures with global automakers, enforcing local content requirements, and promoting local innovation. Companies like Pak Suzuki and other car companies should be encouraged to go beyond merely assembling kits and invest in local research and development (R&D). Similarly, the electronics industry requires the development of tech clusters and the strengthening of institutions such as PAC Kamra and NRTC for advancements in avionics and consumer electronics. Strong industry-academia linkages, involving universities like NUST, GIKI, and PAF-IAST, are vital to fostering innovation.

In the information technology sector, firms like NETSOL can be encouraged to reverse-engineer enterprise solutions, while fiscal incentives should be provided to boost exports and nurture local talent. For pharmaceuticals, companies such as Searle and Ferozsons should focus on reverse-engineering generic medicines under TRIPS-compliant frameworks, alongside developing biosimilar production capabilities.

The renewable energy sector holds immense potential for growth through partnerships with Chinese firms for technology transfer in solar and wind energy. Local companies like the Pakistan Renewable Energy Company can be incentivized to replicate and adapt these technologies to local needs. In defense and aerospace, collaboration with institutions like PAC Kamra and NESCOM should be expanded to focus on dual-use technologies, especially in UAV and avionics development.

The agriculture sector can benefit greatly from adopting mechanization and precision farming techniques inspired by Chinese and Japanese innovations. Local firms like Millat Tractors should be encouraged to develop advanced machinery and hybrid seeds. Subsidies and collaborations for efficient irrigation systems should also be established to improve productivity.

The Pakistan Council of Scientific and Industrial Research (PCSIR) plays a crucial role in advancing reverse engineering and innovation across multiple sectors. Its contributions include the development of hybrid inverters, 3D plastic components for PAC Kamra and POF Wah, spare parts, and agricultural drones. PCSIR Peshawar has pioneered advancements in seed modification and hydroponic agriculture through greenhouse research.

Inspired by the industrial success of China and Japan, PCSIR can focus on technology transfer, creating innovation ecosystems, setting quality standards, and investing in human capital. By fostering public-private partnerships and enhancing R&D facilities, PCSIR is well-positioned to support industries like pharmaceuticals, renewable energy, and electronics, catering to both domestic and global markets.

The Golden Triangle region, comprising Sialkot, Faisalabad, and Gujranwala, serves as the backbone of Pakistan's industrial and export economy. It is a hub of innovation and reverse engineering, driving economic growth despite various challenges. By adopting reverse engineering models from countries like China and Japan, the region's industries can accelerate their development, enhancing competitiveness and fostering sustainable economic progress.

The local street-level industries in Pakistan possess significant potential for reverse engineering. Notably, the small arms and weapons reverse engineering industry in Dara Adam Khel, Khyber Pakhtunkhwa, is highly skilled and internationally renowned—albeit for its illegal yet thriving production of firearms, including pistols, machine guns, and rifles. The craftsmen in this region have mastered the replication of sophisticated, globally recognized weapons.

Similarly, the cutlery and dagger/knife manufacturing industry in Wazirabad is celebrated for its precision and exceptional quality. Gujranwala's local industries are also noteworthy, producing agricultural machinery such as ploughs, water pumps, harvesters, and irrigation systems. The city specializes in industrial tools, precision instruments, and machine parts, while also maintaining a robust steel and iron industry. Gujranwala is a leading producer of fans, air coolers, heaters, and related appliances.

These industries exemplify the potential of reverse engineering in Pakistan. However, their immense capabilities remain largely untapped and warrant further exploration to unlock their full potential.

### *Legal and Institutional framework of the hi-tech industry in Pakistan*

The legal and regulatory framework for hi-tech and emerging industries in Pakistan has evolved to support technological innovation, digital transformation, and the growth of emerging sectors. These frameworks aim to create an enabling environment for technology-driven development by addressing critical aspects such as telecommunications, cybersecurity, e-commerce, and data protection. Below is an overview of the key legislative measures and their respective strengths, weaknesses, and potential areas for reform.

### *Legal and Regulatory Framework*

**The Special Technology Zones Authority (STZA) Act, 2021:** The Special Technology Zones Authority (STZA) has been set up to develop a technology-driven knowledge ecosystem and encourage innovation and futuristic entrepreneurship. The framework offers a comprehensive range of incentives, including tax exemptions, special foreign exchange accounts, and exemption of customs duties on the import of capital goods. It also facilitates targeted investments through a one-window facility to streamline processes for investors. Profits and gains are exempt from tax for a period of 10 years under the Income Tax Ordinance, 2001. Additionally, the minimum turnover tax is also exempt for the same period. Customs duties, income tax, and sales tax on the import of capital goods are waived for 10 years under the Customs Act, 1969, Income Tax Ordinance, 2001, and Sales Tax Act, 1990. These incentives aim to attract global technology companies and foster an enabling environment for startups.

**PCSIR Act, 1973:** This Act provides for the establishment of the Pakistan Council of Scientific and Industrial Research (PCSIR) to undertake, promote, and guide scientific and technological research related to industrial problems in Pakistan. The council also supports the commercialization of research to enhance industrial productivity and exports.

**SMEDA Act, 2017:** This Act laid the foundation for SME Policy 2021, developed by the Small and Medium Enterprises Development Authority (SMEDA) to foster a business-friendly environment for SME growth. It focuses on improving SME access to finance, skills training, technology adoption, and market linkages.

**Seed Act, 1976:** This law regulates the quality of seeds for various plants and crops, ensuring agricultural productivity and sustainability through genetic engineering. It also facilitates seed certification, import, export, and sales regulation to ensure the availability of high-quality seeds in Pakistan.

**NAVTTTC Act, 2011:** The National Vocational and Technical Training Commission (NAVTTTC) was established to empower youth through education and vocational training, thus enhancing equal opportunities for employability. It develops and implements national skills strategies, promotes technical education, and aligns skill development programs with industry needs.

**Plant Breeder's Rights Act, 2016:** This law protects the intellectual property rights of plant breeders, encouraging the development of new plant varieties. It aims to improve food security, enhance the availability of high-

quality seeds, promote research and development in the agricultural sector, and support the production of genetically improved seed varieties.

**Pakistan Telecommunication (Re-Organization) Act, 1996:** This Act restructured the telecommunications sector by establishing the Pakistan Telecommunication Authority (PTA) to regulate services, promote competition, and protect consumer interests. It governs telecommunication service providers and ensures equitable access to telecom services for consumers.

**Electronic Transactions Ordinance (ETO), 2002:** This ordinance provides legal recognition to electronic documents, records, and digital signatures, thus facilitating e-commerce and digital transactions. It applies to a wide range of sectors, including the Ministry of Information Technology and Telecommunication (MoITT), State Bank of Pakistan (SBP), and financial and e-commerce entities.

**Prevention of Electronic Crimes Act (PECA), 2016:** This Act addresses cybercrimes by defining offenses such as unauthorized access, data breaches, cyberterrorism, and electronic fraud. It strengthens cybersecurity frameworks and is enforced by the Ministry of Interior, FIA Cybercrime Wing, and PTA to ensure secure digital interactions.

**National Information Technology Board (NITB) Act, 2022:** This Act formalizes the role of the National Information Technology Board (NITB) in overseeing e-governance initiatives, standardizing IT practices across government departments, and promoting digital transformation. It is applicable to federal and provincial government departments and public sector IT organizations, supporting Pakistan's transition to a digitally enabled economy.

### ***Institutional Framework***

A robust institutional framework supports Pakistan's ambitions in hi-tech and emerging Technology;

1. Intellectual property organization was established in 2005 to protect and strengthen of intellectual properties in respect of patent rights, copy rights and trademarks.
2. National Information Technology Board (NITB): Oversees e-governance initiatives and promotes digital transformation across public sector institutions.
3. Special Technology Zones Authority (STZA): Develops Special Technology Zones to attract investments and foster innovation.
4. Ministry of Information Technology and Telecommunication (MoITT): Provides strategic direction for the ICT sector and oversees policy formulation and implementation. The Pakistan Software Export Board (PSEB) is a government organization under the Ministry of Information Technology and Telecommunication (MoITT), tasked with promoting IT exports and facilitating the growth of Pakistan's software and IT-enabled services industry. It supports startups, freelancers, and companies through capacity-

building programs, IT parks, and international market access initiatives. The National Science and Technology Park (NSTP), established at NUST, Islamabad, is Pakistan's premier innovation and research hub, fostering collaboration between academia, industry, and government. It provides a platform for startups, tech companies, and R&D initiatives to drive innovation and commercialize indigenous technologies

5. Ignite National Technology Fund: Funds innovative technology projects and promotes entrepreneurship.
6. Federal Investigation Agency (FIA) Cybercrime Wing: Handles cybercrime enforcement under PECA.
7. State Bank of Pakistan (SBP): Facilitates digital payments and e-commerce through supportive financial policies.
8. Ministry of Science and Technology (Mo ST): Promotes research and development (R&D), innovation, and the commercialization of scientific advancements, acting as a key driver of technological progress in the country.
9. Higher Education Commission (HEC): Supports academic research, fosters university-industry collaborations, and funds initiatives to enhance R&D capacity in hi-tech fields.
10. Board of Investment (BoI): Facilitates foreign and domestic investments in technology sectors, streamlines regulatory approvals, and promotes Pakistan as a destination for hi-tech industries.
11. Securities and Exchange Commission of Pakistan (SECP): Regulates corporate activities, including those in the tech sector, and fosters innovation through initiatives such as regulatory sandboxes.
12. Competition Commission of Pakistan (CCP): Ensures fair competition and prevents anti-competitive practices in the tech industry, fostering a level playing field.
13. Pakistan Council for Scientific and Industrial Research (PCSIR): Focuses on scientific research and technological development, industrial growth, agriculture, promotion of indigenous innovation, research and development(R&D), renewable energy development and facilitation of reverse engineering (Pharmaceutical innovation, Agricultural high tech equipments, Textile, Energy, Defense and Heavy Industries Equipment).
14. National Radio and Telecommunication Corporation (NRTC): NRTC is a world class telecommunication and electronic equipment manufacturer.
15. Pakistan Ordnance Factory WAH (POF WAH): POF Wah is a Pakistan High Tech organization dealing with premier defence production.
16. Pakistan Aeronautical Complex Kamra (PAC KAMRA): PAC Kamra is major advance aerospace and defence organization responsible for design, development, production, maintenance and overhaul military aircraft and avionics system.

17. The Government established the Cannabis Control and Regulatory Authority (CCRA) in 2024 to oversee licensing and regulation of both hemp and marijuana sectors.
18. The Pakistan Industrial Technical Assistance Centre (PITAC) was established in 1962 through the merger of the Industrial Research and Development Centre (IRDC) and the Industrial Productivity Centre (IPC), operating under the administrative control of the Ministry of Industries, Government of Pakistan.

***SWOT-EETH Analysis of Organizations and Institutions  
Driving Hi-Tech Industry Development in Pakistan***

Organization	SWOT	EETH
PCSIR	<p><b>Strengths:</b> Extensive infrastructure for R&amp;D and reverse engineering. Expertise in industrial and technological innovation across key sectors. Focus on renewable energy, defense, and industrial reverse engineering.</p> <p><b>Weaknesses:</b> Insufficient funding and outdated technology in many facilities. Weak commercialization of R&amp;D outcomes and limited private-sector collaboration.</p> <p><b>Opportunities:</b> Potential to localize production and reduce reliance on imports through reverse engineering. Expansion into high-tech areas such as semiconductors and AI.</p> <p><b>Threats:</b> Global competition in reverse engineering and innovation. Dependence on government funding with limited external investments.</p>	<p><b>Eliminate:</b> Bureaucratic delays and inefficiencies in research approvals.</p> <p><b>Enhance:</b> Infrastructure for high-tech labs and collaboration with private industry.</p> <p><b>Threats:</b> Brain drain and reliance on imported technologies.</p> <p><b>Hedge:</b> Establish partnerships with foreign R&amp;D institutions to mitigate funding constraints and improve knowledge transfer.</p>
STZA	<p><b>Strengths:</b> Legislative support for developing Special Technology Zones (STZs). Incentives for both domestic and foreign investments.</p> <p><b>Weaknesses:</b> Delayed implementation of zones and infrastructure development. Limited capacity to integrate reverse engineering initiatives within STZs.</p> <p><b>Opportunities:</b> Attracting global companies to establish R&amp;D centers in Pakistan. Utilizing STZs as hubs for reverse engineering of advanced technologies.</p> <p><b>Threats:</b> Political instability affecting investor confidence. Regional competition from more established technology zones.</p>	<p><b>Eliminate:</b> Overlapping bureaucratic procedures between federal and provincial governments.</p> <p><b>Enhance:</b> Collaboration with international technology hubs to accelerate zone development.</p> <p><b>Threats:</b> Lack of long-term policy consistency.</p> <p><b>Hedge:</b> Introduce risk-sharing mechanisms for investors in case of policy or infrastructure delays</p>



Organization	SWOT	EETH
MoITT	<p><b>Strengths:</b> Central authority for strategic policy formulation and digital transformation. Successful implementation of policies like ETO (2002) and STZA Act (2021).</p> <p><b>Weaknesses:</b> Limited capacity for monitoring policy outcomes in high-tech and reverse engineering. Gaps in integrating private-sector inputs into policy development.</p> <p><b>Opportunities:</b> Driving innovation in AI, semiconductors, and reverse engineering through robust policies. Facilitating global partnerships for technology transfer and capacity building.</p> <p><b>Threats:</b> Rapidly changing global technological trends. Cybersecurity risks associated with increased digitization.</p>	<p><b>Eliminate:</b> Fragmentation of responsibilities among overlapping institutions.</p> <p><b>Enhance:</b> Focus on emerging areas like AI, IoT, and local manufacturing of tech components.</p> <p><b>Threats:</b> Overdependence on imported technology and lack of skilled workforce.</p> <p><b>Hedge:</b> Strengthen public-private partnerships to promote innovation and mitigate risks.</p>
HEC	<p><b>Strengths:</b> Active role in funding and supporting academic research and innovation. Capacity-building initiatives to develop a skilled workforce for the tech sector.</p> <p><b>Weaknesses:</b> Limited commercialization of academic research. Gaps in aligning research outcomes with industry needs.</p> <p><b>Opportunities:</b> Creating specialized reverse engineering labs and R&amp;D centers at universities. Expanding collaborations with global academic and research institutions.</p> <p><b>Threats:</b> Brain drain due to limited domestic opportunities for researchers. Mismatch between educational outputs and industrial demands.</p>	<p><b>Eliminate:</b> Redundancy and inefficiencies in research funding allocation.</p> <p><b>Enhance:</b> Industry-academia linkages for applied research.</p> <p><b>Threats:</b> Talent loss due to lack of incentives.</p> <p><b>Hedge:</b> Launch scholarship and fellowship programs tied to local employment.</p>

Organization	SWOT	EETH
MoST	<p><b>Strengths:</b> Central authority for national R&amp;D and technological advancement. Oversight of institutions like PCSIR, providing a strong foundation for innovation.</p> <p><b>Weaknesses:</b> Bureaucratic hurdles slowing implementation of high-tech projects. Limited focus on commercialization of R&amp;D outputs.</p> <p><b>Opportunities:</b> Promoting green technologies and renewable energy innovations. Leading reverse engineering efforts in defense and industrial sectors.</p> <p><b>Threats:</b> Rapid global technological changes outpacing domestic capacities. Over-reliance on government budgets for R&amp;D funding.</p>	<p><b>Eliminate:</b> Overlapping mandates with other ministries and organizations.</p> <p><b>Enhance:</b> Capacity-building initiatives for reverse engineering in key sectors.</p> <p><b>Threats:</b> Lack of international collaboration in cutting-edge R&amp;D.</p> <p><b>Hedge:</b> Secure partnerships with global technology leaders to ensure steady knowledge transfer</p>
POF Wah	<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>- Established industrial base</li> <li>- Skilled workforce</li> <li>- Export potential</li> <li>- Government backing</li> <li>- Integration opportunities</li> </ul> <p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>- Technological obsolescence</li> <li>- Bureaucratic hurdles</li> <li>- Limited R&amp;D investment</li> </ul> <p><b>Opportunity</b></p> <ul style="list-style-type: none"> <li>- Public-private partnerships</li> <li>- Global demand for defense equipment</li> <li>- Localization of supply chains</li> <li>- Defense modernization</li> </ul> <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>- International sanctions</li> <li>- Competition from regional players</li> <li>- Geopolitical instability</li> </ul>	<p><b>Eliminate</b></p> <ul style="list-style-type: none"> <li>- Bureaucratic inefficiencies</li> <li>- Outdated technology</li> </ul> <p><b>Enhance</b></p> <ul style="list-style-type: none"> <li>- R&amp;D investments</li> <li>- Export-focused initiatives</li> </ul> <p><b>Threat Management</b></p> <ul style="list-style-type: none"> <li>- Hedge against sanctions through localization</li> </ul> <p><b>Hedge</b></p> <ul style="list-style-type: none"> <li>- Diversify markets and partnerships</li> </ul>

Organization	SWOT	EETH
PAC Kamra	<p><b>Strengths:</b> Indigenous aircraft development (e.g., JF-17) - Technical expertise in MRO - Strategic importance - R&amp;D capabilities</p> <p><b>Weaknesses:</b> Dependence on foreign partners - Export limitations - High operational costs</p> <p><b>Opportunity</b> Commercial aviation market - Aerospace innovation - Global partnerships</p> <p><b>Threats</b> Technology denial regimes - Economic constraints - Cybersecurity risks</p>	<p><b>Eliminate</b> - Reliance on foreign tech</p> <p><b>Enhance</b> - Aerospace R&amp;D - Civil aviation expansion</p> <p><b>Threat Management</b> Strengthen cybersecurity for aerospace system</p> <p><b>Hedge</b> Broaden global collaborations beyond China</p>
NAVTC	<p><b>Strengths:</b> Comprehensive training network - Policy support - Industry collaboration - Youth focus</p> <p><b>Weaknesses:</b> Quality assurance gaps - Outdated curriculum - Limited outreach</p> <p><b>Opportunity</b> High-tech skill development - Global demand for skilled labor - Industry-academia linkages - Digital transformation</p> <p><b>Threats</b> Brain drain - Funding challenges - Rapid technological changes</p>	<p><b>Eliminate</b> Outdated curriculum and delivery mechanisms</p> <p><b>Enhance</b> Digital training platforms - Regional outreach</p> <p><b>Threat Management</b> Address brain drain via incentives</p> <p><b>Hedge</b> - Encourage industry-academia collaboration</p>

***Key Drivers and Barriers of Legal and Institutional Frameworks;***

Category	Framework/Institution	Key Drivers	Barriers
<b>Legal Frameworks</b>	Pakistan Telecommunication (Re-Organization) Act, 1996	<ul style="list-style-type: none"> <li>- Established PTA to regulate the telecom sector.</li> <li>- Promoted competition and consumer protection.</li> </ul>	<ul style="list-style-type: none"> <li>- Outdated provisions for 5G, IoT, and satellite tech.</li> <li>- Weak spectrum allocation policy for emerging technologies.</li> </ul>
	Electronic Transactions Ordinance (ETO), 2002	<ul style="list-style-type: none"> <li>- Legal recognition of electronic documents and signatures.</li> <li>- Facilitated e-commerce and online payments.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited regulations for cross-border e-commerce.</li> <li>- Weak enforcement of digital fraud prevention.</li> </ul>
	Prevention of Electronic Crimes Act (PECA), 2016	<ul style="list-style-type: none"> <li>- Defined and addressed key cyber offenses.</li> <li>- Established FIA Cybercrime Wing for enforcement.</li> </ul>	<ul style="list-style-type: none"> <li>- Broad provisions criticized for limiting freedom of expression.</li> <li>- Limited technical expertise in handling advanced cybercrimes.</li> </ul>
	Special Technology Zones Authority (STZA) Act, 2021	<ul style="list-style-type: none"> <li>- Incentives for technology companies in STZs.</li> <li>- Promotes FDI and innovation hubs.</li> </ul>	<ul style="list-style-type: none"> <li>- Slow development of STZ infrastructure.</li> <li>- Limited awareness among investors.</li> </ul>
	National Information Technology Board (NITB) Act, 2022	<ul style="list-style-type: none"> <li>- Standardized IT practices in government.</li> <li>- Drives e-governance initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>- Resource constraints for large-scale IT standardization.</li> <li>- Resistance to change within public institutions.</li> </ul>

<b>Institutional Frameworks</b>	Pakistan Telecommunication Authority (PTA)	<ul style="list-style-type: none"> <li>- Regulates telecom and promotes digital connectivity.</li> </ul>	<ul style="list-style-type: none"> <li>- Unprepared for 5G and advanced telecom technologies.</li> <li>- Challenges in enforcing service quality standards.</li> </ul>
	National Information Technology Board (NITB)	<ul style="list-style-type: none"> <li>- Oversees e-governance initiatives.</li> <li>- Standardizes IT practices across public-sector institutions.</li> </ul>	<ul style="list-style-type: none"> <li>- Insufficient integration with private sector innovations.</li> <li>- Resource constraints for project implementation.</li> </ul>
	Special Technology Zones Authority (STZA)	<ul style="list-style-type: none"> <li>- Incentives for high-tech companies in STZs.</li> <li>- Provides a framework for technology-driven economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>- Delayed project rollouts and infrastructure development.</li> <li>- Inefficient coordination with provincial governments.</li> </ul>
	Ignite National Technology Fund	<ul style="list-style-type: none"> <li>- Provides funding for innovative tech startups.</li> <li>- Focuses on entrepreneurship and emerging technologies.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited scalability of funded projects.</li> <li>- Gaps in monitoring project outcomes.</li> </ul>
	Pakistan Software Export Board (PSEB)	<ul style="list-style-type: none"> <li>- Supports IT exports and market access.</li> <li>- Promotes IT parks and capacity building for startups.</li> </ul>	<ul style="list-style-type: none"> <li>- Inadequate focus on hardware exports.</li> <li>- Limited outreach to global tech markets.</li> </ul>
	Pakistan Council for Scientific and Industrial Research (PCSIR)	<ul style="list-style-type: none"> <li>- Mandate to promote R&amp;D and reverse engineering in industrial sectors.</li> <li>- Focuses on renewable</li> </ul>	<ul style="list-style-type: none"> <li>- Outdated infrastructure and weak R&amp;D commercialization.</li> <li>- Limited collaboration with private</li> </ul>

		energy and defense technologies.	sector and global R&D. -no persistent efforts and policy to promote reverse engineering in the potential sectors i.e. agriculture, textile.etc
	Ministry of Information Technology and Telecommunication (MoITT)	- Central authority for ICT policies and digital transformation. - Implements key policies like ETO and STZA Act.	- Gaps in integrating private sector inputs into policymaking. - Limited capacity for monitoring policy outcomes.
	Ministry of Science and Technology (MoST)	- Oversees National R&D and tech advancement. - Provides legislative and regulatory support for innovation.	- Bureaucratic delays in implementing high-tech projects. - Limited focus on commercialization of R&D outputs.
	Pakistan Ordnance Factory (POF) Wah	- Government support and funding for defense production. - Demand for indigenous defense equipment due to regional security concerns. - Export potential in global defense markets. - Integration opportunities with private sectors and SMEs	- Outdated technology and manufacturing processes. - Slow decision-making due to bureaucratic hurdles. - Limited R&D investment and innovation culture. - Geopolitical instability impacting supply chains.

	Pakistan Aeronautical Complex (PAC) Kamra	<ul style="list-style-type: none"> <li>- Collaboration with China (e.g., JF-17 development).</li> <li>- Growing demand for military and commercial aviation in the region.</li> <li>- Strong technical expertise in MRO and aerospace manufacturing.</li> <li>- Government support for defense modernization.</li> </ul>	<ul style="list-style-type: none"> <li>- Overreliance on foreign technology and expertise.</li> <li>- Lack of global certifications for exports.</li> <li>- Budgetary constraints limiting R&amp;D growth.</li> <li>- Cybersecurity risks to critical aerospace technologies.</li> </ul>
	National Vocational and Technical Training Commission (NAVTTTC)	<ul style="list-style-type: none"> <li>- Large youth population eager for skill development.</li> <li>- Government policies supporting technical education (e.g., Hunarmand Pakistan).</li> <li>- Collaboration opportunities with industries and academia.</li> <li>- Increasing global demand for skilled labor in high-tech industries.</li> </ul>	<ul style="list-style-type: none"> <li>- Outdated curriculum misaligned with market needs.</li> <li>- Limited outreach to rural areas and marginalized groups.</li> <li>- Quality assurance challenges across training institutions.</li> <li>- Funding and resource constraints.</li> </ul>

***Gap Analysis Based on the Blavatnik School of Government's Oxford Index of Public Administration (OIPA): A Comparative Study of Reverse Engineering and R&D Activities in Universities and Industrial Research Organizations (Including POF Wah) in Pakistan***

Reverse engineering (RE) and research and development (R&D) are crucial for technological and industrial progress. Using the Oxford Index of Public Administration (OIPA).

This analysis evaluates Pakistan's governance and public administration in supporting RE and R&D, focusing on universities and the Pakistan Ordnance Factory (POF) Wah. A GAP analysis compares Pakistan's performance with India at OIPA index No.50 and China at No.51 to identify shortcomings and recommend improvements in strategy, policy, delivery, and workforce development

Domain	Pakistan	India	China	GAP Analysis
<b>Strategy and Leadership</b>	<ul style="list-style-type: none"> <li>Limited focus on Reverse Engineering (RE) in universities and industries.</li> <li>- Leadership lacks strategic goals aligned with national priorities.</li> <li>- POF operates in silos, with limited integration with academia.</li> </ul>	<ul style="list-style-type: none"> <li>-Reverse Engineering (RE) prioritized in defense and industries (e.g., DRDO).</li> <li>- Leadership drives innovation aligned with national goals (e.g., Make in India).</li> </ul>	<ul style="list-style-type: none"> <li>- Reverse Engineering (RE) is a national strategy integrated with universities, industries, and government.</li> <li>- Centralized leadership with a long-term vision.</li> </ul>	<ul style="list-style-type: none"> <li>- Pakistan lacks synergy between academia and industries like Pakistan Ordnance Factory WAH.</li> <li>- Leadership and strategy are fragmented compared to India and China.</li> </ul>
<b>Public Policy</b>	<ul style="list-style-type: none"> <li>- Policies focus heavily on defense but lack emphasis on broader innovation.</li> <li>- Inconsistent funding for RE and R&amp;D.</li> <li>- Outdated policies in POF Wah limit global competitiveness.</li> </ul>	<ul style="list-style-type: none"> <li>-Policies encourage RE for indigenous production (e.g., offset clauses in defense).</li> <li>- R&amp;D supported by targeted programs like Startup India.</li> </ul>	<ul style="list-style-type: none"> <li>- Aggressive policies reduce dependence on foreign tech (e.g., "Made in China 2025").</li> <li>- Well-funded R&amp;D plans.</li> </ul>	<ul style="list-style-type: none"> <li>Pakistan's policies are reactive and lack vision.</li> <li>- India balances RE and R&amp;D effectively, while China excels with robust implementation.</li> </ul>
<b>National Delivery</b>	<ul style="list-style-type: none"> <li>- Poor coordination between universities, industries, and POF.</li> <li>- Weak infrastructure for scaling RE</li> </ul>	<ul style="list-style-type: none"> <li>-Effective coordination ensures marketable R&amp;D outputs (e.g., DRDO, TATA).</li> <li>- National systems</li> </ul>	<ul style="list-style-type: none"> <li>-World-class delivery mechanisms (e.g., Huawei, Alibaba).</li> <li>- Universities act as innovation hubs directly</li> </ul>	<ul style="list-style-type: none"> <li>- Pakistan struggles with execution and delays in product delivery.</li> <li>- India moderately successful;</li> </ul>



	and R&D outputs	support translation of research into products.	linked to industry.	China has exemplary delivery systems.
<b>People and Processes</b>	<ul style="list-style-type: none"> <li>- Lack of skilled manpower in advanced RE and R&amp;D.</li> <li>- Bureaucratic hurdles hinder innovation and collaboration.</li> <li>- Significant brain drain.</li> </ul>	<ul style="list-style-type: none"> <li>- Strong talent pool due to institutions like IITs and IISc.</li> <li>- Industry-academia collaboration fosters innovation</li> <li>- Skill India program</li> </ul>	<ul style="list-style-type: none"> <li>- Heavy investment in education and talent development.</li> <li>- Streamlined processes foster collaboration among stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>- Pakistan faces a talent deficit and brain drain.</li> <li>- Bureaucratic inefficiencies limit potential, unlike India and China.</li> </ul>

*Policy actions implemented by China and India*

Policy Actions	India	China
<b>Hi-Tech Industrial Policies</b>	<ul style="list-style-type: none"> <li>- <b>"Make in India"</b> initiative boosted indigenous manufacturing in defense, electronics, and aerospace sectors.</li> <li>- <b>Electronics Manufacturing Clusters (EMC)</b> scheme encouraged investments in advanced technology.</li> </ul>	<ul style="list-style-type: none"> <li>- <b>"Made in China 2025"</b> plan targeted robotics, AI, semiconductors, and aerospace to reduce reliance on foreign technology.</li> <li>- Provided subsidies, tax breaks, and state funding for strategic industries.</li> </ul>
<b>Public-Private Partnerships (PPP)</b>	<ul style="list-style-type: none"> <li>- Encouraged collaboration between government, academia, and industry through initiatives like DST-PPP.</li> <li>- Partnerships with private firms like TATA and DRDO drove R&amp;D.</li> </ul>	<ul style="list-style-type: none"> <li>- Close integration between state-owned enterprises, private firms, and research universities.</li> <li>- Mandated technology transfer from foreign firms for market access.</li> </ul>
<b>Educational Reforms and Skill Development</b>	<ul style="list-style-type: none"> <li>- Launched the <b>Skill India</b> program to train the workforce for hi-tech industries.</li> <li>- Established centers of excellence at IITs and IISc to focus on innovation</li> </ul>	<ul style="list-style-type: none"> <li>- Invested in STEM education and research institutions.</li> <li>- Promoted university-industry collaboration to develop a talent pipeline for strategic industries.</li> </ul>
<b>Export Policies and Trade Regulations</b>	<ul style="list-style-type: none"> <li>- Defense export policies encouraged indigenous production for global markets.</li> <li>- Tariff incentives supported local manufacturers in hi-tech industries.</li> </ul>	<ul style="list-style-type: none"> <li>- Strict trade policies incentivized local manufacturing and exports.</li> <li>- Focused on exporting high-tech products globally, including AI and consumer electronics.</li> </ul>

*Outcomes*

China's "Made in China 2025" plan resulted in rapid advancements in high-tech manufacturing, particularly in telecommunications (e.g., Huawei, ZTE), semiconductors, and robotics. The aggressive state funding, subsidies, and tax breaks significantly reduced reliance on foreign technologies. China's heavy investment in R&D enabled it to achieve global leadership in AI, 5G, and renewable energy technologies, positioning itself at the forefront of global high-tech industries.

Furthermore, the strong integration between universities, state-owned enterprises, and private companies created a steady pipeline of skilled talent, bolstering its competitiveness in international markets.

India's "Make in India" initiative led to significant progress in indigenous production, particularly in aerospace, defense, and electronics sectors. Collaborative efforts through public-private partnerships (e.g., DRDO and TATA) and policy incentives such as the Electronics Manufacturing Clusters (EMC) scheme enhanced industrial capabilities and promoted innovation. Increased R&D spending driven by academia-industry collaboration has fostered advancements in software, defense, and biotech. While India has seen moderate growth in high-tech exports and improved recognition of its technology firms, its outcomes remain sector-specific and less diversified compared to China's overarching achievements.

### ***Lessons for Pakistan***

#### **1. Develop National Hi-Tech Strategies**

Formulate a comprehensive national strategy, similar to "Made in China 2025" or "Make in India," targeting key high-tech sectors such as defense, artificial intelligence (AI), and electronics.

#### **2. Enhance Policy Integration**

Design cohesive policies that incentivize indigenous production, reduce reliance on imports, and foster collaboration between universities, industries, and organizations like the Pakistan Ordnance Factories (POF), PAC Kamra, NRTC, etc.

#### **3. Invest in Education and Skills Development**

Reform the education system to prioritize STEM fields and align with hi-tech industry needs while introducing technical and vocational training programs modeled on initiatives like India's "Skill India."

#### **4. Foster Public-Private Partnerships (PPP)**

Promote PPP models to fund and implement large-scale R&D projects while incentivizing industries to collaborate with universities and research institutions like PCSIR, PARC, Incubation centers, etc.

#### **5. Enhance Delivery Mechanisms**

Build research parks and industrial zones to scale R&D efforts and outputs, and streamline bureaucratic processes to facilitate faster commercialization of innovations.

By learning from the successes of India and China, Pakistan can establish a robust ecosystem for reverse engineering and R&D, driving sustainable economic growth and technological advancement.

## *Comparative Analysis of Pakistan's Hi-Tech Industry in the Global Context*

### *Global Overview of Hi-Tech Industry*

1. **United States:** Leads globally with Silicon Valley as a hub of innovation (National Science Board, 2022). Policies emphasize R&D incentives, robust IP protection, and strong academia-industry linkages.
2. **China:** Focuses on mass manufacturing, state-sponsored R&D, and AI (World Intellectual Property Organization, 2023). Strong government support and investment in infrastructure have been key.
3. **India:** Excels in IT services, driven by a highly skilled workforce, outsourcing opportunities, and cost competitiveness (McKinsey & Company, 2022).
4. **European Union:** Known for high standards in research, sustainability, and data protection (e.g., GDPR) (European Commission, 2023). Strong public-private partnerships drive innovation.
5. **South Korea:** A global leader in electronics and semiconductors, supported by significant investment in R&D, advanced manufacturing capabilities, and a focus on innovation in telecommunications and automotive technologies (OECD, 2023).

### *Global Context and Benchmarking*

Pakistan's high-tech industry, particularly its Information Technology (IT) sector, has demonstrated significant growth and potential in recent years. The country has been recognized as a global technology hub, notably being named "Tech Destination of the Year" at GITEX Global 2024, reflecting its commitment to innovation and the increasing prominence of its IT industry on the international stage (Ali, 2024).

In the fiscal year 2023-2024, Pakistan's IT exports reached a record \$3.2 billion, marking a 24% increase from the previous year. This growth positions Pakistan as a notable player in the global IT services market, though it still trails behind leading countries like India, whose technology exports are approaching \$200 billion (Tribune Correspondent, 2024; Criterion Quarterly Editorial Team, 2023). To further enhance its global standing, Pakistan has been actively participating in international technology exhibitions and fostering collaborations with global tech leaders (Ali, 2024).

### ***Alignment with Global Standards and Best Practices***

To align with global standards, Pakistan has initiated several measures:

- **Policy Development**  
The government approved the Science, Technology, and Innovation Policy-2021, aiming to address the needs of various sectors and meet the challenges of the new era, particularly in light of changing socio-economic dynamics and emerging technologies (TechX.pk Staff, 2021).
- **Regulatory Frameworks**  
Efforts are underway to align national policies with international standards, particularly in satellite technology and Low Earth Orbit (LEO) satellites, to enhance connectivity and drive technological innovation (Radio Pakistan, 2025).
- **Special Technology Zones (STZs)**  
The establishment of STZs aims to incentivize tech companies to operate within the country through tax-exempt programs, fostering an environment conducive to innovation and growth (Forbes Technology Council, 2022).
- **Skill Development and Certification**  
There is a need for massive training programs to capitalize on Pakistan's IT potential. Institutions like the Higher Education Commission (HEC), National Vocational and Technical Training Commission (NAVTTTC), and Technical Education and Vocational Training Authority (TEVTA) must be revamped to keep up with the rapidly evolving IT landscape. Furthermore, all skill certifications awarded in Pakistan should be accredited by a global agency to ensure quality and international recognition (Moin, 2024).
- **Infrastructure and Connectivity**  
Recent internet disruptions have caused significant economic harm and uncertainty for businesses and investors, particularly in the crucial information technology sector. Ensuring reliable and high-speed internet connectivity is essential for maintaining global business operations and customer reliability (Mehta, 2023).
- **Research and Development (R&D)**  
Increased investment in R&D is crucial to foster innovation and keep pace with global technological advancements. This includes focusing on emerging technologies such as Artificial Intelligence (AI) and ensuring that the country is prepared to adopt and implement these technologies effectively (Josh and Mak International, 2023).

By addressing these areas, Pakistan can further strengthen its high-tech industry, enhance its global competitiveness, and ensure alignment with international standards and best practices.

## ***Comprehensive GAP Analysis of Pakistan's Hi-Tech Industry Development Framework Key Deficiencies and Gaps:***

### **1. Strategic Vision and Leadership**

Pakistan lacks a cohesive national strategy focused on developing high-tech sectors such as artificial intelligence (AI), semiconductors, renewable energy, and reverse engineering. Leadership in this domain is fragmented, with inadequate collaboration between government, academia, and industry. Unlike China's "Made in China 2025" or India's "Make in India" initiatives, Pakistan lacks a long-term roadmap to guide its high-tech ambitions effectively.

### **2. Policy and Legal Frameworks**

Investment in research and development (R&D) remains below 1% of GDP, significantly lagging behind global benchmarks. Inconsistent policy implementation, such as the delayed rollout of Special Technology Zones (STZs), has diminished investor confidence. Outdated legal frameworks, including the PCSIR Act (1973) and the Seed Act (1976), fail to address contemporary technological needs. Additionally, initiatives like the Digital Pakistan Vision lack alignment with broader innovation-driven goals, reflecting a fragmented approach to policy formulation.

### **3. Human Capital Constraints**

The country's limited focus on STEM education and technical training has resulted in a severe skill shortage in advanced technologies. Weak industry-academia linkages further contribute to the production of graduates ill-equipped to meet the demands of high-tech industries. Moreover, Pakistan faces significant brain drain, with many talented individuals leaving due to inadequate opportunities and incentives.

### **4. Infrastructure and Technology Gaps**

Institutions such as PCSIR and POF Wah are hampered by outdated infrastructure and insufficient funding, stifling innovation and R&D efforts.

The delayed establishment of technology hubs and innovation clusters, such as STZs, has further hindered growth in key sectors.

### **5. Regulatory and Institutional Challenges**

Overlapping mandates among organizations like MoITT, PCSIR, and STZA create inefficiencies, while weak governance frameworks, such as the inadequate cybersecurity provisions under PECA (2016), leave technological industries vulnerable. Additionally, programs like the Ignite Fund and PSEB initiatives suffer from limited oversight, reducing their overall impact.

### **6. Economic Contribution**

High-tech industries contribute less than 1% to Pakistan's GDP, a stark contrast to China (15%) and India. The country's exports remain heavily reliant on traditional sectors such as textiles and agriculture, with minimal diversification into high-value technology products

## ***Issues and Challenges***

### ***Inconsistent Policies, lack of political will and funding priorities***

1. Lack of integrated long term national strategy targeting critical hi-tech sectors due to ad hoc approach by successive governments. Meager allocation of funds for R&D and almost no funding for reverse engineering.
2. Absence of strategic policy regarding promotion of Reverse Engineering to compete with developing countries to minimize massive import burden i.e 54.73 Billion USD FY 23/24.
3. Limited collaboration and strong integration among academia, industry, and government. There is a missing link between research institutions like PCSIR, PARC, and other relevant stake holders with industry resultantly futile research mismatch industry needs.
4. Institutions like POF Wah, PAC Kamra, NRTC, PCSIR, etc work in silos, having no appropriate mechanism of interconnectivity for optimum use of knowledge sharing and Skilled Human resource, R&D and technology sharing.
5. Absence of robust Industry- academia linkages effecting economy in two ways, firstly, graduates are getting degrees which have very less demand in market resultantly less

employability and secondly, the research of academia is outdated and not market-oriented.

6. Universities and Research Institutions are lagging behind in the field of reverse engineering which is need of the day for developing countries like Pakistan.
7. Persistent law and order situation discourages the confidence of private sector.

### ***Private Sector's Concerns***

The private sector faces significant challenges due to government apathy towards skilled talent, particularly in areas like the Golden Triangle of Dara Adam Khel. Persistent law and order issues undermine investor confidence, while a trust deficit prevails due to the government's unstable tax policies. Additionally, fears of institutional high-handedness, corruption, and red-tapism further discourage private sector engagement. The lack of a centralized portal for streamlined processes and inadequate government protection for local industries have led to an influx of Chinese products, leaving domestic businesses vulnerable

### ***Legal Framework Gaps***

The legal framework suffers from overlapping and duplication of federal and provincial laws following the 18th Amendment. Many laws, regulations, and rules, such as the PCSIR Act 1973, PARC Act, and Seed Law 1976, remain outdated, lacking provisions for production incentives and private-public partnership (PPP) inclusivity. Additionally, multiple and cumbersome approval mechanisms, licensing processes, and NOC requirements significantly hinder the ease of doing business and research outsourcing. A comprehensive legislative review to establish and strengthen academia, industry, and government linkages is urgently needed.



### ***Human Capital Constraints***

There is inadequate emphasis on STEM education and skill development, particularly in institutions like NAVTTC, which undermines the workforce's global competitiveness. The mismatch between course design and the needs of both international standards and local industries—such as AI, reverse engineering, digital marketing, blockchain, and data analytics—leads to low employability. Furthermore, a lack of opportunities and incentives drives significant brain drain, exacerbating the human capital challenge.

### ***Insufficient R&D and Innovation***

Investment in research and development (R&D) remains below 1% of GDP, far below global benchmarks. Weak commercialization of research outputs further limits the potential for innovation and industrial growth.

### ***Infrastructure Deficiencies and Technological Shortcomings***

Outdated facilities in key institutions, such as PCSIR and POF Wah, hamper technological advancement. Infrastructure development in Special Technology Zones (STZs) faces persistent delays, while the economy continues to rely heavily on traditional sectors like textiles and agriculture. The contribution of high-tech industries to GDP remains alarmingly low, at less than 1%.

## *Conclusion*

Pakistan's hi-tech industry reflects significant potential but remains hindered by systemic inefficiencies, inadequate investment in R&D, outdated infrastructure, weak and outdated legal and institutional framework, lack of strategic leadership and political patronization. While there is a crucial missing link among academia-industry- public and private Sector. However, initiatives like STZs and the Digital Pakistan Policy are steps forward, their fragmented execution and insufficient alignment with global best practices have limited their impact due to law and order situation, inappropriate funding and trust deficit of private sector. Without substantial reforms, Pakistan risks falling further behind in global competitiveness and long term economic sustainability based on High Tech Innovations. Reverse Engineering, a pivotal strategy successfully employed by nations like China and Japan, remains underutilized in Pakistan to strengthen their emerging industries. Institutions such as the Pakistan Aeronautical Complex (PAC Kamra), the Pakistan Ordnance Factory (POF Wah), PCSIR, PARC, NRTC and local private sector based in golden triangle (Gujranwala, Faisalabad and Sialkot Region) have demonstrated ample capacity for reverse engineering, especially in defense, agriculture, pharmaceutical, sports, electrical appliances and avionics. However, these efforts lack the scale and integration necessary for broader industrial impact. By adopting reverse engineering as a critical component of its emerging industrial strategy, Pakistan can stimulate innovation, enhance and strengthen its export competitiveness, and foster technological self-reliance. This will ultimately pay dividends in reducing gigantic import bill and will provide a prosperous pathway to economic sustainability.

## *Recommendations*

### *Develop a Comprehensive National Strategy*

- Pakistan must urgently formulate a high-tech strategic vision "Made in Pakistan" and implement policies on a war footing, drawing inspiration from successful initiatives like China's 'Made in China 2025' and India's 'Make in India.' Building on the framework of Pakistan's Vision 2025 and the Digital Pakistan initiative, the country should prioritize advanced sectors such as artificial intelligence, semiconductors, agriculture, pharmaceuticals, sports, renewable energy, avionics and drone technology, and aerospace. By adopting the concept of reverse engineering and aligning these efforts with existing national development strategies, earmarking sufficient continuous funding, Pakistan can accelerate technological progress and strengthen its position in the global economy.

- The “Triple Helix Model” has immense potential in Pakistan through collaboration academia, industry and government to boost innovation and reverse engineering capabilities of technological advancements. By aligning these sectors Pakistan can create a robust ecosystem that derives sustainable economic development. Though this model has been adopted by institutions like National Science and Technology Park IAST-PAF, yet this model be introduced as a National Policy to create a hub where universities, industries and government work together to create technology driven solution.
- The mandate of Special Investment Facilitation Council (SIFC) be extended in devising and implementing the strategic policy in promoting High Tech Innovative Emerging Industries (based on Reverse Engineering similar to China Model) with special focus on reverse engineering. To ensure its policy implementation, a high-level task force be established. Engineering
- By harnessing the untapped potential of the Golden Triangle region, comprising Faisalabad, Gujranwala, and Sialkot, through collaboration with all relevant stakeholders, including academia and the private sector. Moreover, weapon industry based on reverse engineering in Dara Adam Khel and Uncut Gem Stone Market in Peshawar has a great potential. This region, burdened by decades-old, outdated infrastructure due to government inaction and lack of support, has seen its potential for reverse engineering largely overlooked. Revitalizing this area with financial investment, state ownership, and encouragement to adopt cutting-edge strategies comparable to those of China, India, and Japan could revolutionize Pakistan's high-tech economic growth.
- To promote reverse engineering in local industry, tailored strategies inspired by China and Japan are essential. High-tech industries require technology-sharing agreements, while hydroponic agriculture needs subsidies for adoption. Risk-sharing mechanisms should support local R&D, and talent pools must be developed for electronics, automobiles, and renewable energy. In textiles, joint ventures with global brands should be facilitated, and surgical equipment manufacturing upgraded with best practices. Tax incentives on raw material imports can attract private industry and drive sustainable growth.
- The HEC should make a policy that universities perform predominantly reverse engineering-oriented research in collaboration with industries, i.e. Chambers of Commerce to make research industry oriented and demand based.
- Centralized one window operation to be supervised by SIFC be established for ease of business.
- Engineering Development board should make mandatory on auto manufacturers to produce auto parts locally.

- Trust building measures be taken to bridge gap between public and private sectors. Moreover, it will minimize high-handedness and corruption of Govt. Officials.
- Buy Pakistani slogan be promoted and implemented by Government where all Government institutions to buy local products.

#### ***Strengthen Legal Frameworks***

- Consistent unification and upgradation of various overlapping legislations within Federal Government those creating hurdles in promotion and adaptation of advance high-tech industry as well as provincial laws in consonance with federal legislative structure for ease of doing business.
- Amendment be made in PCSIR, PITAC and PARC Act regarding “production” and “PPP” inclusion for establishing link to promote mass production at commercial level, need based research and self-sustainability of these institutions to adopt reverse engineering at par with China and Japan.
- Involvement of Business Houses in the process of legislation for uniform policies and clear roadmap for high tech innovative emerging industries.
- Steps be taken to modify IP laws by giving space for promotion of reverse engineering.
- Draft semiconductor policy and artificial intelligence policy may be finalized and approved at earliest.

#### ***Enhance Human Capital Development and R&D Investment***

- Reform STEM through HEC and expand vocational training under NAVTTC, NUST, CTIL. etc, to promote reverse engineering and creation of incubation centers at regional level to establish linkages with universities and local industry.
- Foster industry-academia collaboration to align curricula with high-tech market demands, increase R&D spending to 2% of GDP in the medium term, and encourage public-private partnerships to fund large-scale innovation with a focus on applied research addressing local industrial needs.

***Accelerate Infrastructure Development***

- Upgrade facilities in PCSIR, POF Wah, and other key institutions and fast-track the development of STZs to attract foreign direct investment (FDI).

***Foster Institutional Efficiency***

- Streamline the roles of POF Wah, PAC Kamra, MoITT, PARC, NSTP, PCSIR, and STZA to eliminate redundancies and encourage startups and spin-offs from university research through industry funding and government support.
- Enhance the governance and accountability of initiatives like Ignite Fund and PSEB and strengthen cybersecurity measures to protect digital assets.

***Align with Global Standards***

- Benchmark policies against global leaders like China, India, and Japan and establishment of local academia linkages with foreign universities promoting high tech emerging industries to create a talent pool for reverse engineering industry.
- Ensure that technical certifications from Pakistan meet global quality standards.

***Implementation Plan: Log Frame Matrix:***

Objective	Output	Activities	Indicator	Time lines	Responsible Entities
<b>Develop a Comprehensive National Strategy</b>	A national high-tech strategic vision and policies aligned with Pakistan's Vision 2025.	Conduct stakeholder consultations (government, academia, industry). - Draft and finalize strategy inspired by global models. - Establish a high-level task force for reverse engineering with defined TORs.	- Strategy document approved. - Number of stakeholders consulted. - Task force operational.	6 months	Ministry of Planning & Development (MoPD), Special Investment Facilitation Council (SIFC)
	- Integration of the "Triple	Draft policy to formalize academia-	Policy approved. - Number of	One year	Ministry of Science and Technology

	Helix Model" as a national policy.	industry-government collaboration. - Present policy to Parliament for approval.	collaborative hubs established.		(MoST), National Science and Technology Park (NSTP), HEC
	Revitalization of the Golden Triangle region (Faisalabad, Gujranwala, Sialkot).	- Conduct assessments of regional industrial potential. - Provide funding for modernizing infrastructure and promoting reverse engineering.	Number of modernization projects initiated. - Investments secured for regional development.	2 years	Ministry of Commerce, Provincial Governments
<b>Strengthen Legal Frameworks</b>	Revised PCSIR and PARC Acts to include "PPP" and "production" components.	- Draft and table amendments in PCSIR and PARC Acts. - Include business houses in consultative meetings for uniform policy formulation.	Amendments approved. - Number of consultations held.	One year	Ministry of Law, MoST, PCSIR, PARC, Board of Investment (BoI)
	- Unified federal and provincial laws for ease of doing business.	Review and unify overlapping legislation at federal and provincial levels.	- Unified legal framework finalized. - Reduced legal hurdles reported.	18 months	Ministry of Law, BoI
<b>Enhance Human Capital</b>	- Updated STEM curriculum	Partner with academia	Number of curricula updated.	One year	HEC, NAVTTC, NUST

<b>Development and R&amp;D Investment</b>	aligned with high-tech industry demands.	and industry to revise curricula. - Implement updates across educational institutions.	- Adoption by universities and technical institutes.		Universities
	50 regional incubation centers established. - R&D spending increased to 2% of GDP.	- Identify locations and secure funding for incubation centers. - Increase budget allocations for R&D and establish public-private funding mechanisms.	- Number of operational incubation centers. - Percentage of GDP allocated to R&D. - Number of R&D projects initiated.	2-5 years	NAVTTTC, NSTP, MoST, Ministry of Finance
<b>Accelerate Infrastructure Development</b>	Modernized facilities at PCSIR, POF Wah, and other key institutions.	Conduct infrastructure audits. - Upgrade facilities using allocated funding.	Number of institutions modernized. - Audit reports completed.	3 years	MoST, Ministry of Defence Production
	10 operational Special Technology Zones (STZs).	Identify locations, secure FDI, and initiate construction.	Number of operational STZs. - Amount of FDI attracted.	5 years	Special Technology Zones Authority (STZA), BoI
<b>Foster Institutional Efficiency</b>	Streamlined roles of key institutions (e.g., POF Wah, PAC Kamra, PARC, PCSIR).	Conduct role audits. - Eliminate redundancies and implement streamlined processes.	Number of institutions streamlined. - Audit findings implemented.	2 years	MoST, Ignite Fund, PSEB
	- 10 start-	Increase	- Number of	2	Ignite Fund,

	ups or spin-offs funded annually.	Ignite Fund allocations. - Establish start-up-friendly policies.	start-ups funded. - Reports from Ignite Fund and PSEB.	years	PSEB, NSTP
<b>Align with Global Standards</b>	- Partnership s with 10 foreign universities.	- Identify potential partners. - Sign MoUs and initiate collaborative programs.	- Number of partnerships established. - Joint projects initiated.	3 years	HEC, Ministry of Foreign Affairs
	- Certification s aligned with global standards.	- Benchmark local certification s against global standards. - Upgrade certification processes.	- Number of certifications aligned. - Reports from certification bodies.	2 years	NAVTTC, PCSIR, MoST



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# Critical Evaluation of Textile Industry of Pakistan and Way Forward

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## Abstract:

The textile industry plays a significant role in Pakistan's economy, contributing over 60% to the country's exports and 8.5% to its GDP. Despite its potential, the sector faces numerous challenges, including outdated machinery, high energy costs, limited diversification into man-made fibers (MMF), and competition from regional players. The sector's reliance on cotton-based products limits its ability to capitalize on global shifts toward MMF products. Additionally, infrastructure deficits, such as inadequate logistics and testing facilities, hinder growth. The paper explores the historical evolution of Pakistan's textile industry, from its early growth to its current state, highlighting key issues such as high tariffs, inefficient energy systems, and liquidity shortages. The study concludes with several recommendations, including technological upgrades, energy efficiency measures, diversification into MMF, regulatory reforms, workforce skill development, and market diversification. These strategies aim to enhance the sector's global competitiveness and sustainable growth.

## Key words:

Textile Industry, Pakistan, Man-Made Fibers, Energy Efficiency, Export Diversification.

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## *Introduction*

The textile sector is playing a critical role in the economic development of many countries. It covers a broad range of activities starting from raw material procurement such as cotton, wool, and synthetic fibers to manufacturing, distribution, and retailing of textile products. Textiles serve not only as essential consumer goods, but also as key industrial products used in various sectors, including automotive, healthcare, construction, and defense. The textile industry is divided into two primary categories: natural fibers like cotton, wool, and silk, and man-made fibers such as polyester, nylon, and acrylic. The rise of synthetic fibers has revolutionized the textile landscape, driven by innovations in material science and the demand for versatile, durable, and cost-effective alternatives to natural fibers. The textile cluster has a relatively large value chain with multiple distinct sectors. The following flow chart depicts the major processes along with the output of textile value chain.



The global textile market is characterized by significant geographical dispersion, with production concentrated in countries like China, India, Bangladesh, Pakistan, and Vietnam, which benefit from large labor forces and growing industrial infrastructure. The sector has seen continuous growth due to rising global population, increasing urbanization, and the growing demand for fashion and home textiles in both developed and developing markets.

The global textile market is estimated at \$1.79 trillion in 2024, accounting for 1.63% of the world's GDP. The size of the global textile market is projected to reach \$2.0 trillion by 2028. It employed around 430 million people out of the total global workforce of 3.62 billion people. Some of the biggest textile markets of the world include USA, China, India, Japan, UK and Germany with combined market value of around \$1.1 trillion. Further, the global textile market is heavily dominated by women textile products, which valued at \$930 billion or 52 percent of the total global textile market. The share of men's and children's apparel market is valued at \$588 billion and \$274 billion respectively in 2024.–

Textiles are a dominant component of Pakistan's exports, constituting over 60% of total export revenues and contributing around 8.5% to the country's GDP. (PBS, Pakistan Bureau of Statistics, 2022) Pakistan is the 12<sup>th</sup> largest exporter of textile having export value of \$16.69 billion in FY 2024. It is 4<sup>th</sup> largest producer and 3<sup>rd</sup> largest consumer of cotton. It comprises of 46% of

the total manufacturing sector and provides employment to 40 percent of the labor force that comes to 4.672 million approximately. There are 408 textile units (40 Composite and 368 Spinning units). The textile industry of Pakistan has a total established spinning capacity of 1550 million kgs of yarn, weaving capacity of 4,368 million square meters of fabric, finishing capacity of 4000 million square meters and apparel of over one billion pieces (estimated). Textile Business in Pakistan is concentrated in and around Karachi, Lahore and Faisalabad wherein cotton yarn, woven fabric, knitwear, bedding and garments dominate the domestic production. The main export markets for Pakistan are the US, EU, UK, Turkey, and UAE, wherein Pakistan is supplying cotton fabrics, knitwear, bed linen, towels, and ready-made garments to global brands such as Zara, H&M, Adidas, John Lewis, Target and Macy's. (Survey, 2023-24)

### *Evaluation and Development of Textile Sector in Pakistan*

**(1940s–1950s: Foundation and Early Growth)** During this period, the textile sector in Pakistan began its journey shortly after independence in 1947, with the establishment of basic infrastructure to support cotton production. The government prioritized the development of this sector due to its potential for economic growth and employment. By the 1950s, Pakistan had established its first textile mills, laying the groundwork for a burgeoning industry.

**(1960s: Industrial Expansion)** The 1960s marked a period of rapid industrialization in Pakistan, with significant growth in the textile sector. Government policies encouraged private investment, leading to the establishment of new spinning and weaving units. During this decade, Pakistan emerged as a major exporter of cotton yarn and fabrics, solidifying its position in global markets.

**(1970s: Nationalization)** The 1970s were characterized by the nationalization of key industries, including textiles, under government-led economic reforms. While this move aimed to streamline operations and promote equitable growth, it led to inefficiencies and stagnation in the textile sector. The industry faced challenges such as outdated technology and reduced competitiveness.

**(1980s: Privatization and Revival)** In the 1980s, the government reversed its nationalization policies, initiating a wave of privatization that revitalized the textile industry. Investments in modern machinery and technologies began to flow, leading to increased productivity. Exports of finished textiles, such as garments and knitwear, gained momentum, marking a shift toward value-added products.

**(1990s: Global Integration)** The 1990s saw Pakistan's textile sector becoming more integrated into global trade. The country benefited from international trade agreements and preferential market access, which boosted exports. However, infrastructural challenges and inconsistent policies limited the industry's full potential. This period also witnessed a growing focus on

ready-made garments and home textiles.

**(2000s: Value Addition and Modernization)** In the 2000s, the sector experienced significant advancements in value addition and modernization. Export-oriented policies and investments in state-of-the-art facilities allowed Pakistan to cater to global demand for high-quality products. The textile industry expanded its portfolio to include bed linens, towels, and branded apparel. However, energy shortages and regional competition began to pose challenges.

**(2010s: Sustainability and Competitiveness)** The 2010s brought a renewed emphasis on sustainability and global competitiveness. Pakistan's textile industry adopted eco-friendly practices and compliance with international standards to meet the demands of global buyers. Despite persistent challenges such as energy crises and high production costs, the sector remained a significant contributor to national exports, with major global brands sourcing from Pakistan.

**(2020s: Innovation and Strategic Focus)** The 2020s have been marked by a focus on innovation, digitalization, and diversification. The industry has embraced advancements in textile technology and sustainable practices, positioning itself as a competitive player in the global market. Strategic export relationships, particularly with the US, EU, and China, alongside efforts to enhance value-added production, have been key drivers of growth. However, competition from regional players and the need for continued investment in infrastructure and human capital remain pressing concerns.

Despite its inherent advantages, Pakistan's textile sector facing multiple challenges that hindering its global competitiveness and sustainable growth. Key issues include high energy prices, reliance on outdated machinery, fluctuating cotton supply & prices, and intensified competition from regional players, particularly Bangladesh, India, and Vietnam. To address these constraints and shift the industry's focus toward value-added products such as apparel and fashion garments, both private-sector initiatives and government interventions are crucial.

### ***Problem Statement***

The textile sector of Pakistan is a major contributor to the country's export economy. However, once a strong export earning industry for Pakistan and a major player in the global market, it is facing significant challenges which are threatening its sustainability. The situation warrants critical analysis of situation surrounding textile sector of Pakistan in order to identify key issues and challenges and to suggest actionable recommendations for policy interventions and strategic initiatives to revitalize the sector, enhance export performance, and ensure long-term sustainability.

## *Scope of the Study*

The study aims to critically evaluate the textile sector of Pakistan, focusing on its historical development and current structure. It will assess the sector's contribution to the economy, employment, and exports while identifying key challenges. The research will analyze government policies, technological advancements, and sustainability practices to provide strategic recommendations for enhancing productivity and competitiveness.

## *Research Methodology*

A Mix methods approach has been used, using both quantitative and qualitative data wherever possible. Most of the sources have been consulted online and data from different primary and secondary sources including Ministry of Commerce and & Textile, TDAP, Ministry of Finance, PBS, APTMA, Board of Investment and experts' opinion have been used in the study. Besides, analysis tools including Situational Analysis, Legal, Policy and Institutional Framework Analysis, Comparative Analysis, Blavatnik's OIPA and SWOT-EEETH Analysis have been used.

## *ANALYSIS*

### *Situation Analysis*

The textiles and apparel sector are the single largest contributor to the economy's export earnings, and constitutes about 50 to 60 percent of total exports. The industry has an installed capacity of achieving approximately \$25 billion/year of exports but the same has not been materialized. The past two years have been among the most challenging for Pakistan's textiles and apparel sector. Between 2020 and 2022, the sector experienced a remarkable growth of 54% in exports, driven by favorable macroeconomic conditions and export facilitation measures. However, the momentum was disrupted during the 2022-23 economic crisis, compounded by the withdrawal of key support policies, including zero-rating for export-oriented industries and regionally competitive energy tariffs (RCET). As a result, textiles and apparel exports declined to \$16.5 billion in FY23 and 16.65 in FY24. (Inam, APTMA, 2025)

Pakistan's textiles sector is predominantly cotton-based, relying heavily on the country's domestic cotton supply; Pakistan is the fourth largest producer of cotton and produced around 10.2 million bales in FY 24. Cotton production in Pakistan is affected by pests like pink bollworm and whitefly, water scarcity due to Indus River shortages, and climate change causing erratic weather and flooding. Low-quality seeds, outdated farming practices, soil degradation, reliance on manual labor, and limited research and development further reduce yields and quality, undermining the industry's potential. Approximately 84% of Pakistan's apparel exports are cotton-based, significantly higher than the global average of 46%. The global market has been shifting toward synthetic materials, which are increasingly

preferred for high-quality/performance apparel. Further, the cotton produced in the country is of low quality and thus cannot be used for manufacturing high quality apparel/products. (Survey, 2023-24)

The ginning sector in Pakistan is a critical component of the cotton value chain, but it faces significant challenges that affect the quality and efficiency of its output. With over 1,200 ginning units primarily located in Punjab and Sindh, many operate below optimal capacity due to outdated technology, fluctuating cotton production, inefficient machinery leading to high contamination levels during the ginning process which reduces the quality of cotton and its competitiveness in international markets. Issues such as manual handling, inconsistent quality standards, and energy shortages further exacerbate the situation. Additionally, limited investment and poor seed cotton quality contribute to inefficiencies in the sector. (PBS, 2025)

The spinning sector in Pakistan comprises approximately 408 textile units, including 40 composite units and 368 spinning units, with an installed capacity of around 13.4 million spindles and 198,800 rotors. However, operational capacity utilization rates for spindles and rotors stood at 72.3% and 63.7%, respectively, during FY24. One of the primary issues in spinning sector is the high cost of energy, which constitutes approximately 35-40% of the total production expenses for spinning mills. In Pakistan, electricity rates are around 13 cents per kilowatt-hour, whereas regional competitors like China, Bangladesh, Vietnam, and India enjoy lower rates of 7.5, 9, 8, and 8 cents per kilowatt-hour, respectively. Further, the sector struggles with outdated technology and limited access to credit, particularly among small spinning units, fluctuating and low-quality local cotton supply leading to reliance on imported cotton and limited value addition as it predominantly focuses on spinning raw cotton without diversification into synthetic fibers or advanced blends. (PACRA, 2024).

The weaving sector in Pakistan is a critical part of its textile industry, with the majority of its capacity concentrated in the unorganized sector, accounting for nearly 89% of total production. The organized sector comprises around 44 registered weaving mills, equipped with approximately 9,084 installed looms, of which 6,398 were utilized during FY2024. Despite this infrastructure, the sector has been underperforming, with its total fabric production reaching approximately 7.9 billion square meters in FY2024. The organized segment contributed only 870 million square meters, reflecting challenges such as outdated technology, energy inefficiencies, and limited modernization. The weaving sector in Pakistan faces significant challenges, including high energy costs, reliance on imported raw materials, outdated machinery, and limited technological investment. Elevated borrowing costs and regulatory burdens further strain financial resources, while the dominance of unorganized, lower-quality production hampers competitiveness. The sector's focus on low-value products and insufficient modernization adds to its struggles against regional competitors. (PACRA, 2024).



Pakistan's export destinations and export products are not much diversified thus limiting the potential of textile exports. Major imported of Pakistani textile products include USA (26.29%), UK (9.95%), Spain (7.69%), Germany (7.6%), Netherlands (7.4%), Italy (4.21%) etc. Major products include cotton men's suits, jackets & trousers, towels, pullovers/cardigans, Denim fabric of cotton, cotton bed sheets/linen (Window, 2025). Pakistan has not been able to utilize its optimal potential of exports thus resulting in unrealized export potential of USD 7.8 billion. Major categories where Pakistan could not achieve its growth potential include apparel (USD 3.3 billion) and home textile (USD 2.3 billion) (ITC, 2024). Pakistan's global export of textile products for the last five years is as follows:

#### **Pakistan Global Exports of Textile Products**

<b>Year</b>	<b>Billion USD</b>
(1)	(2)
FY 2019-20	13.04
FY 2020-21	15.50
FY 2021-22	19.64
FY 2022-23	16.84
FY 2023-24	16.86
FY 2024-25	6.20*

\*FY 2024-25 data is for July 2024 to October 2024 (Window, 2025)

#### **Pakistan's Top Fifteen Textile Imported Products (% of Total Imports)**

<b>Product Description</b>	<b>FY 2019-20</b>	<b>FY 2020-21</b>	<b>FY 2021-22</b>	<b>FY 2022-23</b>	<b>FY 2023-24</b>	<b>FY 2024-25*</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
6309.0000: Worn clothing	11.79	13.39	8.86	10.58	20.43	21.52
5201.0090: Cotton, Other	28.5	29.47	33.31	41.48	14.21	19.63
5402.3300: Polyester Filament Yarn (DTY)	5.95	5.72	6.73	5.97	8.83	7.41
5504.1000: Staple Fiber of viscose rayon	7.88	7.72	8.38	6.15	9.41	3.99
6001.9290: Pile knitted or crocheted fabric, Other	1.54	2.24	2.27	1.72	3.89	3.97
5503.2010: Polyester Staple Fiber	3.62	3.42	2.56	2.02	2.12	3.20
5402.4700: Polyester Filament Yarn (FDY)	2.85	2.52	3.13	3.56	4.8	3.08
5504.9000: Artificial Staple Fibers of Viscose; Other	1.22	1.33	1.83	2.37	2.51	2.99
5403.3100: Yarn of viscose rayon	3.15	2.78	2.38	2.25	2.92	2.36

5208.5100: Plain weighing cotton fabric	0.05	0.08	0.36	0.13	0.65	1.72
5205.2800: Cotton yarn; measuring less than 83.3dt	0.78	0.64	0.76	0.88	1.02	1.43
5407.5200: Woven Fabric; Dyed	0.21	0.26	0.28	0.22	0.6	1.20
5205.2700: Cotton yarn; measuring less than 106.38dt	0.68	0.58	0.44	0.41	0.31	1.18
5402.4410: Elastomeric yarn	1.48	1.33	2.33	1.15	1.12	1.07
5804.1000: Tullies and Other net Fabrics	0.19	0.17	0.52	0.66	0.92	1.00
Total	69.89	71.65	74.14	79.55	73.74	75.75

\*FY 2024-25 data is for July 2024 to October 2024 (Window, 2025)

Pakistan is a major player in the global textile industry, primarily as an exporter, but it also imports a considerable volume of textile products to meet its domestic and industrial needs. Pakistan's textile imports largely include cotton (24.77% of total textile imports FY 25 till October, 2025) man-made filaments (19.97%), man-made staple fibers (13.81%). These imports are essential to support Pakistan's vast textile and apparel sector, which relies on blending local cotton with imported materials to produce high-quality goods (Window, 2025). Following tables explain trends in Pakistan's textile imports over the last five years:

#### Pakistan's Global Textile Imports

Year/Period	Value (Billion USD)
(1)	(2)
FY 2019-20	2.76
FY 2020-21	4.14
FY 2021-22	4.82
FY 2022-23	3.86
FY 2023-24	2.82
FY 2024-25	1.21*

\* Data is for July 2024 to October 2024 (Window, 2025)

#### Pakistan's Top Fifteen Textile Imported Products (% of total imports)

Product Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
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5804.1000: Tullies and Other net Fabrics	0.19	0.17	0.52	0.66	0.92	1.00
Total	69.89	71.65	74.14	79.55	73.74	75.75

\*FY 2024-25 data is for July 2024 to October 2024 (Window, 2025)

### ***Business Environment Analysis:***

#### ***Ease of Doing Business:***

- **Regulatory Barriers**

Pakistan's low ranking of 147 out of 190 countries in the World Bank's Ease of Doing Business Index underscores significant regulatory hurdles. Excessive red tape, cumbersome licensing processes, and complex legal frameworks make establishing and operating a business a daunting task. Investors face delays in obtaining permits, navigating taxation policies, and meeting compliance requirements. These inefficiencies not only increase operational costs but also discourage new market entrants.

The regulatory framework of textile sector is further weakened by inconsistent enforcement of policies. Frequent changes in tax regimes, electricity and LNG price hike and inconsistent application of laws create an unpredictable business environment. To attract investment, Pakistan must streamline its regulatory processes, simplify licensing, and establish consistency in policy enforcement.

- **Corruption**

Ranked 133 out of 180 countries in Transparency International's 2024 Corruption Perceptions Index, corruption is a pervasive issue in Pakistan's public and private sectors (Transparency International, 2023). Bribery, embezzlement, and favoritism undermine investor confidence and distort market dynamics. Foreign investors often encounter demands for kickbacks in exchange for approvals or permits, leading to higher operational costs and ethical dilemmas. Corruption erodes trust in institutions and discourages long-term investment. Addressing this issue requires robust anti-corruption frameworks, enhanced accountability, and digitization of processes to minimize human intervention.

- **Bureaucracy and Administrative Inefficiencies**

Dealing with Pakistan's bureaucratic machinery can be costly and time-consuming. Investors often struggle with prolonged delays in obtaining approvals, negotiating contracts, and resolving administrative issues. Government officials, at times, lack the technical expertise required to facilitate foreign investments efficiently.

Despite recent improvements in logistics, poor trade facilitation and infrastructure continue to inhibit export competitiveness and trade growth in Pakistan. For example, the typical container dwell time at ports in Karachi (95 percent of Pakistan's international trade goes through one of the two ports in Karachi) is seven days, three times longer than that of developed countries and East Asia. As of 2018, border and documentary compliance to import into Pakistan takes 263 hours, compared to 11.9 hours in OECD countries.

These inefficiencies discourage investors seeking a streamlined and predictable investment process. Introducing capacity-building programs for government officials, establishing one-stop investment facilitation centers, and reducing bureaucratic layers can significantly improve the investment climate.

### *Cost of Doing Business*

- **Low-Quality Cotton Production**

Cotton, the backbone of Pakistan's textile industry, suffers from poor quality due to suboptimal farming practices, outdated seed technology, and insufficient pest control measures. Pakistani cotton often lacks the desired length, strength, and fineness required for high-quality textile products. Consequently, manufacturers are compelled to import superior-grade cotton from countries like Egypt and the USA, significantly increasing production costs.

The reliance on imported cotton not only raises raw material expenses but also exposes the industry to exchange rate fluctuations and international market volatility. To reduce dependency on imports,

Pakistan must invest in research and development (R&D) for better seed varieties, modernize farming techniques, and implement stringent quality control measures in cotton production.

- **Cotton production fluctuations and import duties** further raised costs, affecting the downstream value chain. Crucially, the lack of a robust implementation framework and over-reliance on government financial commitments undermined policy effectiveness. Comprehensive reforms in execution, energy access, and value-chain integration are critical for future policy success.

- **Outdated Machinery and Obsolete Production Methods**

The textile sector in Pakistan relies heavily on outdated machinery and traditional methods of production, which undermine efficiency and product quality. Many factories operate with machinery that is decades old, leading to frequent breakdowns, higher maintenance costs, and increased energy consumption. The inability to produce innovative and high-value-added textile products limits the industry's ability to compete with technologically advanced countries like China, India, and Bangladesh (Lodhi, 2023).

Modernizing the machinery and adopting advanced technologies such as automated looms and computer-aided design (CAD) systems can significantly enhance productivity and reduce operational costs. Government incentives, such as low-interest loans and subsidies for machinery upgrades, can encourage the adoption of modern technologies (Ahmad M. , 2015).

- **Labor-Intensive Production**

Due to the lack of technological advancements, Pakistan's textile sector remains labor-intensive, relying heavily on manual processes. While this provides employment opportunities, it also reduces efficiency and increases production costs. Labor-intensive production often leads to inconsistent product quality, delays in meeting international orders, and higher operational expenses.

To address this issue, the sector must focus on automation and process innovation. Introducing robotic systems, artificial intelligence (AI), and data-driven production methods can optimize efficiency and reduce dependence on manual labor. Moreover, technology-driven production can help meet global quality standards, enhancing the competitiveness of Pakistani textiles in international markets.

- **Unskilled Labor Force**

Pakistan's textile industry is burdened with a largely unskilled and semi-skilled workforce, which contributes to low productivity and inconsistent product quality. Many workers lack the technical expertise required to operate modern machinery or adhere to international quality standards. This skill gap results in high wastage, rework, and lower profit margins (The Express Tribune, 2011).

Investing in workforce training and development is essential to overcoming this challenge. Establishing technical and vocational training institutes specializing in textile production and collaborating with international organizations for skill enhancement programs can equip workers with the necessary skills. Additionally, government and industry stakeholders should prioritize on-the-job training and certification programs to improve labor productivity.

- **Global transformation from Cotton to Man Made Fiber (MMF)**

Pakistan's textile sector, heavily reliant on natural fibers like cotton and wool, is grappling with escalating production costs and diminishing competitiveness in the global market. While these fibers have traditionally been the backbone of textile production, the global industry has undergone a significant transformation, shifting towards man-made fibers (MMFs) due to their economic and sustainable advantages. MMFs now dominate over 70% of the global textile market, leaving natural fiber-based producers like Pakistan struggling to keep pace. Key barriers include a lack of production capacity for MMF and economic distortions, such as high import duties on polyester staple fiber (PSF) and purified terephthalic acid (PTA), which make MMF production uncompetitive. These duties, coupled with anti-dumping measures, have led to inflated domestic prices, significantly higher than those in countries like China and India. Furthermore, Pakistan's outdated PTA plant and restricted market conditions, including limited access to import LCs for the spinning industry, hinder growth. This protectionist approach benefits a few domestic manufacturers but harms the broader textile export market, with the cost disparity impacting competitiveness. To revive the sector, the government must reconsider import duties and anti-dumping policies, making MMF production more viable and competitive, thus driving textile exports and supporting economic recovery. Reducing these barriers would foster greater production, job creation, and diversification of export markets (Mubasal, 2024).

- **Energy and Infrastructure Issues:**

One of the most significant challenges faced by the textile sector is the erratic energy supply. Frequent power outages and high electricity costs not only increase the operational costs for textile mills but also lead to production delays, hampering timely deliveries (Inam, Beyond the Billionaires Bash: Pakistan's Real Crisis, 2024). Poor infrastructure, including outdated roads and inadequate transportation networks, further exacerbates the sector's logistical challenges.

- **Delayed or unpaid facilitation scheme** funds and inadequate allocation for infrastructure, training, and compliance programs hindered progress. Energy shortages during the first policy period and uncompetitive energy pricing during the second further restricted growth. High international commodity prices, volatile markups, and

liquidity challenges from inconsistent tax refund mechanisms compounded the sector's struggles. The withdrawal and intermittent restoration of the zero-rating regime aggravated liquidity issues for exporters.

- **Tariff Structure** The current tariff structure poses several challenges for the manufacturing sector, especially export-oriented industries. High tariffs on imported raw materials, intermediate goods, and machinery have significantly increased production costs, undermining competitiveness. Sustained tariff protection has also resulted in inefficiencies, leaving domestic manufacturers unable to maintain their market share or compete globally. Moreover, elevated tariffs have created an anti-export bias, as producers find the protected domestic market more attractive than international markets. Domestic consumers ultimately bear the cost, as protected items are priced higher than their international counterparts. The complexity of the tariff structure—characterized by multiple duty slabs, concessionary SROs, and regulatory duties—further compounds these issues. Additionally, the high tariffs have encouraged smuggling, under-invoicing, and mis-declaration of goods. SMEs, in particular, face discrimination due to differing tariffs for industrial and commercial importers, as they often rely on commercial channels for raw materials. Frequent regulatory duty changes have made the tariff environment unpredictable, deterring investment. Lastly, replacing the zero-percent duty slab on raw materials and machinery with higher tariffs has further weakened the competitiveness of the manufacturing sector.
- **Technology Up-gradation Fund (TUF)** initiatives failed due to limited disbursement and funding shortages, stalling investment in modern machinery. Similarly, the Drawback of Local Taxes and Levies (DLTL) scheme faced delays, limiting its intended impact. No significant infrastructure or skill development initiatives materialized, and major projects like Pakistan Textile City Limited were liquidated.:

### *Legal and Policy Analysis*

Following are the **Existing Laws and Regulations** governing the Textile Sector:

### *Legal Framework*

- **Labour Laws and Worker Protection:** The legal framework governing labor in Pakistan's textile sector includes several labor laws designed to ensure worker welfare, protect rights, and regulate working conditions. However, there are gaps in enforcement, and the sector faces challenges related to child labor, low wages, and poor working conditions. The key labor laws include:

- a) **The Factories Act, 1934:** Regulates working conditions in factories, including provisions for worker safety, wages, and hours of work.
- b) **The Industrial Relations Act, 2012:** Governs industrial relations and the rights of workers to form trade unions, address grievances, and resolve disputes.
- c) **The Employment of Children Act, 1991:** Aimed at prohibiting child labor in the industrial sector, although its implementation remains weak, particularly in the textile industry. Despite these laws, enforcement remains a significant issue due to weak regulatory bodies, corruption, and lack of awareness. Consequently, the legal framework's failure to fully protect workers contributes to inefficiencies in production and diminished reputation in global markets that prioritize labor rights.
- d) **Intellectual Property Rights (IPR):** The textile sector, particularly in high-end fashion and design, benefits from intellectual property protections. Pakistan is a signatory to international treaties like the **World Trade Organization's Trade-Related Aspects of Intellectual Property Rights (TRIPS)**. However, Pakistan struggles with enforcing intellectual property laws, especially in the textile sector, where counterfeiting and unauthorized copying of designs are prevalent. Effective intellectual property enforcement is crucial to ensuring innovation, brand protection, and market competitiveness, particularly in the global fashion and textile markets.

- **Environmental Laws**

The textile sector is a significant contributor to pollution and environmental degradation, yet environmental regulations remain underdeveloped. Pakistan has laws like:

- a) **The Pakistan Environmental Protection Act, 1997:** Provides a framework for environmental protection, but the textile industry often fails to comply with waste management and pollution control measures.
- b) **The National Environmental Quality Standards (NEQS):** These include guidelines for air, water, and noise pollution, but enforcement is inconsistent, and compliance remains a major challenge for textile manufacturers.

The lack of strong environmental regulations and enforcement results in unsustainable production practices that not only harm the environment but also hinder Pakistan's access to eco-conscious global markets.



### *Policy Framework*

- **The Strategic Trade Policy Framework (STPF) 2020-25** outlines key objectives, including geographical and product diversification, cost reduction via tariff rationalization, and the pursuit of regional connectivity. The policy emphasized increasing competitiveness by supporting export-oriented industries with incentives such as preferential taxation, access to credit, and infrastructure development. The STPF aimed to achieve an export target of \$31.2 billion for the fiscal year 2021-22, with projections of \$37.38 billion in 2022-23, \$45.81 billion in 2023-24, and \$57.03 billion by 2024-25. However, the targets set by the policy could not be achieved due to inconsistent implementation, and inadequate support mechanisms for smaller firms
- **Textile Policy 2009-2014:** Pakistan's first comprehensive **Textile Policy** aimed to increase exports, improve productivity, and diversify the sector's product range. The policy focused on:
  - a) Upgrading technology in the textile sector.
  - b) Creating incentives for export growth.
  - c) Enhancing value-added textile products.
  - d) Developing a competitive edge in the international market.

However, implementation was slow, and the policy failed to achieve its key targets due to a lack of political will, inconsistent implementation, and inadequate support mechanisms for smaller firms.

- **The Textile Policy 2014-2019** aimed to enhance Pakistan's textile sector's global competitiveness, increase exports, and generate employment. It focused on value addition, technology upgradation, and skill development while addressing challenges like energy shortages and high production costs. Key initiatives included a Rs. 64.15 billion package offering incentives such as duty drawbacks, technology support, and subsidized loans. The policy targeted doubling textile exports to \$26 billion by 2019, fostering investment, and promoting diversification into man-made fibers and technical textiles. However, implementation challenges, energy crises, and insufficient funding hindered achieving its ambitious goals.
- **The Textile Policy 2020-2025** focuses on enhancing the textile industry's competitiveness and aims to bring about reforms in several key areas. Its goals include:
  - a) Targeting \$26 billion in textile exports by 2025.
  - b) Providing fiscal incentives, including rebates on taxes and duties for textile manufacturers.
  - c) Promoting value-added products such as garments and technical textiles.
  - d) Encouraging technology adoption and skill development.

While the policy demonstrates a forward-looking approach, its success

depends heavily on timely implementation and resolving the structural inefficiencies that continue to plague the sector. The policy is also vulnerable to shifting political priorities, which may hinder its long-term effectiveness.

- **National Tariff Policy:** Pakistan's tariff policy imposes duties of 5% on purified terephthalic acid (PTA) and 7% on polyester staple fiber (PSF), alongside anti-dumping duties of up to 12%. These high tariffs increase costs for manufacturers and hinder investment in man-made fiber (MMF) production, which dominates global demand. Consequently, Pakistan's textile exports remain overly reliant on cotton-based products, limiting diversification and reducing competitiveness in the international market.

Import tariffs on industrial machinery, spare parts, and raw materials significantly increase production costs. While global competitors have eliminated such tariffs to promote industrial growth, Pakistan's manufacturers bear excessive financial burdens, reducing the price competitiveness of their exports in international markets.

Exporters face persistent delays in receiving duty drawback payments, which are meant to refund duties and taxes on raw materials used in export goods. Rates for these drawbacks have not been revised in years, further diminishing their value. These delays exacerbate liquidity crises for exporters, undermining their financial stability.

- **Free Trade Agreements (FTAs):**

Pakistan has entered into several FTAs which can provide reduced tariffs and easier access to partner countries. For example, the FTA with China and preferential access granted under the Generalized System of Preferences (GSP) by the European Union enables enhanced export opportunities for Pakistani textiles.

- i. China-Pakistan Free Trade Agreement-II (CPFTA-II): China-Pakistan Free Trade Agreement (CPFTA), implemented in 2006, has facilitated increased textile exports to China by reducing tariffs on key products. However, this has also led to a significant rise in imports from China, contributing to a trade imbalance.
- ii. Pakistan-Sri Lanka Free Trade Agreement (PSFTA), signed in 2005 offers preferential tariffs on textile exports to Sri Lanka. Pakistan-Sri Lanka Free Trade Agreement (PSFTA) has provided Pakistani textile products with preferential access to Sri Lankan markets. Despite these opportunities, Pakistan's textile exports to it have not reached its full potential, often due to competition from other exporting nations and non-tariff barriers.
- iii. Pakistan-Malaysia Free Trade Agreement formally known as the Malaysia-Pakistan Closer Economic Partnership Agreement (MPCEPA), was signed in 2007 and implemented in 2008. This comprehensive agreement aimed to enhance bilateral trade by reducing tariffs on various products, including textiles. Despite the

- FTA's provisions, Pakistan's textile exports to Malaysia have experienced only marginal growth as many high-potential textile items are either excluded from Malaysia's concession list or face higher tariffs compared to those offered to other trading partners of Malaysia like China and India.
- iv. Indonesia-Pakistan Preferential Trade Agreement (IP-PTA), signed in 2012 and implemented in September 2013, has had a notable impact on the textile trade between the two nations. Indonesia lowered import tariffs on Pakistani textiles, including cotton yarn and fabrics, facilitating increased exports from Pakistan. This preferential treatment provided Pakistani textile exporters with a competitive edge in the Indonesian market.
  - v. The European Union's Generalized Scheme of Preferences Plus (GSP+) has significantly influenced Pakistan's textile trade with Europe. Implemented in January 2014, GSP+ grants Pakistan duty-free access to the EU market for approximately 66% of tariff lines, predominantly benefiting the textile and garment sectors, which constitute over half of the country's exports. Despite these gains, challenges persist. Pakistan's export portfolio remains concentrated in textiles, indicating a need for diversification to fully leverage GSP+ benefits. Moreover, compliance with the 27 international conventions tied to GSP+ status, covering human rights, labor standards, environmental protection, and good governance, is imperative. The EU has raised concerns regarding Pakistan's implementation of these conventions, suggesting that future trade privileges may be contingent upon tangible progress in these areas. (Rafique, 2023)

### ***Institutional Framework Analysis***

The institutional framework governing this sector encompasses institutional mechanisms aimed at fostering growth and ensuring sustainability. Ministry of Commerce and Textile is the main ministry that governs textile sector. A specialized Textile Wing in the ministry deals with matters of textile and is headed by DG Textile who reports to Executive Director general (EDG). EDG report to Special Secretary & Secretary Commerce Division. (Commerce, 2025) The Ministry of Commerce and Textile is responsible to formulate trade policies including textile sector. Its functions also include Export Promotion (TDAP/Trade Officers Abroad), Trade Agreements (FTAs, PTAs etc.), Market Development (trade fairs, expos, marketing campaigns), Regulatory Framework (Tariff policy, anti-dumping duties, countervailing duties, licensing etc.), Capacity Building/Skill Development, Research & Development (R&D) and Sustainability & Compliance with domestic laws & international standards). (Commerce, 2025)

Trade Development Authority of Pakistan (TDAP), operating under the administrative control of the Ministry of Commerce, is involved in national policy making for maximizing exports of goods and services from Pakistan. It is headed by CEO who is appointed from a private sector and assisted by Secretary TDAP. There are 10 Directorate Generals under Secretary TDAP one of which deals with textile and leather goods. It also organizes exhibitions, trade fairs, and delegations to and from Pakistan aiming to enhance the country's export potential in conjunction with Trade Missions. Abroad. (TDAP, 2025)

The role of a Pakistani Trade Officers stationed abroad is to increase the foreign exchange earnings of Pakistan through promoting and facilitating the expansion of Pakistan's visible and invisible exports to the territory to which he is assigned. A Trade Officer posted to a diplomatic mission works under direct administrative supervision of the Permanent Head of the Mission. They however are substantively controlled by Ministry of Commerce which manages them in consultation with TDAP. The Trade Officer assists the Ministry of Commerce in formulation of national trade policy and export development strategy and reports on development taking place in the host country having a bearing on Pakistan's trade, commerce and economic relations with the said country/territory. Currently 65 trade missions in different parts of the world are working for the purpose. (Commerce, 2025)

The National Tariff Commission (NTC) is an autonomous body established under the NTC Act of 2015. It is operating under the administrative control of the Ministry of Commerce. Its primary role is to advise the federal government on tariff-related matters and implement trade defense laws to protect domestic industries from unfair trade practices. The commission is composed of Chairman and the three members. It is assisted by three Directorate General and a Secretary NTC. (NTC, 2025)

The Ministry of Commerce and Textile in Pakistan faces significant challenges in policy implementation, with comprehensive plans often failing to achieve their targets due to bureaucratic inefficiencies and lack of follow-through. Small and Medium Enterprises (SMEs) in the textile sector struggle to access financing, modern technologies, and export markets, limiting their growth potential. The industry's reliance on outdated machinery and insufficient investment in research and development (R&D) has hindered its global competitiveness. Additionally, many manufacturers, particularly SMEs, face difficulties meeting international labor and environmental standards, affecting market access to regions like the EU and the US. The sector's dependence on cotton as the primary raw material makes it vulnerable to production and price

fluctuations, while limited diversification into synthetic fibers and technical textiles restricts growth. Frequent changes in taxation and export rebate policies create uncertainty, further discouraging long-term investments. Despite being a major textile exporter, Pakistan's share in the global textile trade has declined, losing ground to competitors like Bangladesh, Vietnam, and India, which benefit from better policy support and infrastructure. Structural weaknesses, including institutional overlaps among entities like the Ministry of Commerce, FBR, and TDAP, poor infrastructure, and weak international marketing efforts, exacerbate these challenges, reducing the sector's competitiveness and market reach.

The Federal Board of Revenue (FBR) is Pakistan's apex tax authority, operating under the Ministry of Finance. Its responsibilities encompass tax administration, revenue collection, and enforcement of fiscal policies. Key responsibilities include collection of taxes including income tax, sales tax, customs duties, excise duties, and federal levies; maximizing revenue generation to meet national financial needs and development objectives; drafting and implementing tax policies to promote economic stability and growth; managing imports and exports through Pakistan Customs; ensuring compliance with trade regulations and preventing smuggling and illegal trade activities. (FBR, 2025)

Pakistan Customs is organized under FBR. A dedicated Customs Wing headed by Member Customs, who report directly to Chairman FBR, oversees working of Custom Collectorates. Custom Collectorates are field formations divided on the basis of geographical locations and nature of duties. It includes: Model Customs Collectorates (MCCs) which handle major customs operations, including import/export clearance; Preventive Collectorates with focus on anti-smuggling and enforcement of customs laws; Appraisement Collectorates dealing with the assessment and valuation of goods for duty purposes and Enforcement Collectorates focusing on compliance and enforcement of customs regulations. Besides, Regional and Sub-Regional offices have also been established in major cities and key trade zones to facilitate operations at the local level. Customs Stations and Checkpoints are also located at international borders, airports, seaports, and dry ports. (FBR, 2025)

One of the main contributors to an industry-wide liquidity crisis in the textiles and apparel sector is the dysfunctional taxation regime. Refunds of Income Tax, Sales Tax, Provincial Sales Tax and payment of Custom Duty Drawback are paid after a delay of months and are even blocked unnecessarily sometimes causing liquidity crisis. Further, all custom administrations across the globe are making all out efforts to minimize dwell time at ports which have been reduced

to only a few hours in the modern world. In Pakistan it still spreads to days and weeks adding to the cost of inputs and making exports uncompetitive in the international market.

### *Gap Analysis*

The textile sector of Pakistan, while being a cornerstone of the country's economy, faces significant gaps that hinder its global competitiveness and growth potential.

- **Policy and Regulatory Environment:** Pakistan's textile industry faces challenges due to frequent policy changes, weak implementation, and a lack of stakeholder involvement in policy formulation. In contrast, countries with stable and investor-friendly policies, such as Vietnam, attract higher foreign investment, fostering industry growth. The gap in Pakistan lies in inconsistent energy pricing, delayed tax refunds, and overregulation, which hamper the sector's ability to thrive and attract both domestic and foreign investment. **Institutional and governance gaps** persist, with fragmented roles, overlapping jurisdictions, and lack of coordination among stakeholders. Transparency in subsidy allocation and limited accountability mechanisms aggravate inefficiencies (Board of Investment, 2022).
- **Product Diversification, Value Addition and Branding:** Pakistan's textile industry faces a significant challenge due to its heavy reliance on cotton-based products, which account for over 97% of textile exports, while synthetic and woolen textiles contribute less than 3%. Globally, markets are shifting towards synthetic fibers and wool-based products, leaving Pakistan behind competitors like Vietnam, which has successfully focused on value-added products. The gap lies in the country's lack of capacity to produce synthetic textiles and diversify its product line, which limits growth and competitiveness in international markets (APTMA, 2024).
- **Innovation and Technology:** Pakistan's textile industry struggles with insufficient investment in research and development (R&D) and outdated production technologies, resulting in limited adoption of technical textiles and e-textiles. In contrast, leading exporters like China and Vietnam have successfully integrated advanced technology and innovation into their value chains, enhancing their competitiveness. The key gap in Pakistan lies in the absence of policy-driven support for innovation and technology upgradation, which hampers the industry's ability to modernize and remain competitive in the global market (Ministry of Commerce, 2022).
- **Market Diversification:** Pakistan's textile exports are heavily concentrated in a few markets, primarily the USA, EU, and China, resulting in missed opportunities in emerging markets like Japan, Canada, and the Middle East. In contrast, competitors like Vietnam and Bangladesh have successfully expanded their export footprints

globally. The gap lies in Pakistan's limited exploration of untapped markets and the lack of robust marketing strategies, hindering the diversification and growth of its textile export base (APTMA, 2024).

- **Infrastructure and Cost of Doing Business:** Pakistan's textile industry struggles with inadequate infrastructure, including unreliable energy supply, poor logistics, and outdated machinery, which, combined with high production costs and limited access to finance, significantly hinder its competitiveness. In contrast, global competitors offer efficient infrastructure and regionally competitive energy rates. The key gap in Pakistan is the lack of investment in infrastructure development, such as textile parks and Special Economic Zones (SEZs), which could support industry growth and reduce operational challenges (Bhutta, 2024).
- **Workforce Development:** Pakistan's textile industry faces the issue of limited vocational training programs and low female participation in the workforce, which restricts its ability to meet the demands of modern production technologies. In contrast, countries like China and Turkey prioritize workforce upskilling, ensuring a skilled labor force that aligns with industry advancements. The gap in Pakistan lies in the lack of focus on skill development and a low emphasis on gender inclusion, preventing the industry from fully capitalizing on its potential human resources (Board of Investment, 2022).

### *Comparative Analysis of Pakistan with India and Italy*

The textile sector in Pakistan, despite its significant contribution to the national economy, has faced a series of challenges, particularly in comparison to global textile powerhouses like India and Italy. A comparative analysis with these countries reveals key areas where Pakistan's textile sector could benefit from adopting best practices.

#### • **Policy Framework, Infrastructure, Technology and Value Addition Comparison**

**India** has consistently demonstrated robust growth in its textile industry, driven by a combination of strategic policies, technological advancements, and a large, skilled labor force. India's government has implemented the **National Textile Policy** with a clear focus on modernization, value addition, and environmental sustainability. For instance, the **Technological Upgradation Fund Scheme (TUFS)** has been pivotal in incentivizing the adoption of advanced machinery and technology in Indian textile mills. This has allowed India to improve its product quality, efficiency, and competitiveness globally. Additionally, India's efforts to focus on value-added textiles, such as garments and technical textiles, have increased its global export share. Pakistan, in contrast, remains overly reliant on raw material exports, such as cotton and yarn, failing to capitalize on the higher value added by finished goods. Pakistan's textile policy lacks a coherent

strategy to drive technological innovation and create value-added products that could elevate its position in the international market.

**Italy**, on the other hand, is renowned for its high-end textile and fashion industry, which thrives on innovation, branding, and sustainable practices. Italy's focus is on **luxury fashion and design**, supported by world-class craftsmanship and a high degree of industry specialization. Italian textile companies are known for their integration of design, quality control, and environmental sustainability, which has allowed them to command premium prices for their products in the international market. Moreover, Italy's emphasis on **research and development (R&D)** in textile manufacturing, especially in creating eco-friendly fabrics and high-performance materials, has set a global benchmark. Pakistan's textile industry, however, struggles with outdated technology, inefficient production processes, and a lack of investment in R&D, which hinders its ability to innovate or compete in premium markets.

- **Labor Market and Human Resource Development**

Another stark contrast is **labor management**. India has made significant strides in improving working conditions, skill development, and labor laws, even though it still faces challenges in these areas. Pakistan, on the other hand, grapples with child labor issues, poor working conditions, and insufficient labor training programs. While India has initiated skill development programs to enhance workforce productivity, Pakistan's textile labor force remains largely unskilled and underpaid, contributing to inefficiencies in production and lowering the industry's global appeal.

- **Sustainability**

Moreover, **sustainability practices** in India and Italy are far more advanced compared to Pakistan. Italy's textile sector has a strong focus on **eco-friendly production** techniques, including water and energy efficiency, and certifications like OEKO-TEX and GOTS, ensuring that products meet international environmental and social responsibility standards. In contrast, Pakistan's textile mills contribute significantly to environmental degradation, with limited enforcement of environmental regulations and a lack of incentive for adopting sustainable practices.

In conclusion, while Pakistan's textile sector holds enormous potential due to its large cotton production base and low labor costs, it faces significant challenges when compared to the best practices observed in India and Italy. To elevate its global standing, Pakistan must adopt a more forward-thinking approach focused on technological innovation, value addition, sustainability, skill development, and market diversification. Drawing inspiration from India's policy frameworks and Italy's emphasis on design, quality, and sustainability could guide Pakistan toward a more competitive and resilient textile industry.



### *Blavatnik (OIPA) Framework for Analysis*

Pakistan ranks at 90 with a 0.41 index score in the Blavatnik School of Government's Oxford Index of Public Administration 2024 (OIPA). Country's performance in data availability is even more deplorable with the lowest ranking in category D. The textile sector, a cornerstone of Pakistan's economy, accounting for over 60% of export earnings, was analyzed across four domains of OIPA—Strategy and Leadership, Public Policy, National Delivery, and People and Processes.

#### *1. Strategy and Leadership*

Pakistan Ranking: 102/120

**Strategic Capacity:** Frequent changes in textile policies, lack of a long-term vision, and minimal alignment with global trends like sustainability and digitization undermine the sector's competitiveness.

**Cross-Government Collaboration:** Poor coordination between key stakeholders, including the Ministry of Commerce, Ministry of Industries, FBR, and Trade Development Authority of Pakistan (TDAP), hinders coherent policy implementation.

**Openness and Communication:** Policy formulation lacks stakeholder consultation, particularly with small and medium enterprises (SMEs), workers' unions, and industry experts, leading to unrealistic policy objectives.

**Integrity:** Corruption in subsidies, tax refunds, and regulatory authorities undermines trust and efficiency, favoring larger players at the expense of SMEs.

**Innovation:** Limited investment in research and development (R&D) restricts innovation in textiles, especially in value-added segments. Dependency on low-value exports such as raw cotton and yarn persists.

#### *2. Public Policy Domain*

Pakistan Ranking: 78/120

**Policy Making:** Textile policies lack consistency, with frequent shifts in export subsidies, energy pricing, and taxation. Unrealized commitments like establishing textile parks reflect weak implementation.

**Financial Management:** Tariff adjustments and energy pricing policies benefit larger exporters but increase operational costs for SMEs. Access to credit remains constrained due to high-interest rates.

**Regulation:** Regulatory inefficiencies, combined with complex tax regimes, discourage new entrants and SMEs from scaling operations. The lack of enforcement of quality standards undermines competitiveness.

**Crisis and Risk Management:** Textile supply chains remain vulnerable to energy shortages, exchange rate volatility, and global economic shifts. The government lacks a proactive risk management strategy, evident during COVID-19 and global trade disruptions.

**Use of Data:** Data-driven policymaking is non-existent. The absence of centralized databases for production, exports, and labor force hampers evidence-based decision-making.

### *3. National Delivery*

Pakistan Ranking: 95/120

**System Oversight:** Regulatory bodies like TDAP and Pakistan Standards and Quality Control Authority (PSQCA) lack autonomy and technical capacity. Political interference further erodes their effectiveness.

**Digital Services:** While some progress is visible in digitalizing customs and export documentation, the sector lacks a comprehensive digital ecosystem for textile stakeholders.

**Tax Administration:** High dependency on refunds through the zero-rated regime leads to liquidity issues for exporters. Tax evasion and under-invoicing are widespread.

**Border Services:** Inefficient customs operations and non-tariff barriers at borders delay shipments, increasing costs and affecting competitiveness.

**Social Security:** Textile workers, particularly in informal segments, lack social security coverage, access to healthcare, and opportunities for skills development.

### *4. People and Processes Domain*

Pakistan Ranking: 87/120

**Employees Engagement:** The sector employs over 15 million workers, yet labor laws remain poorly implemented. Weak unions and exploitative practices lead to low productivity and morale.

**Diversity and Inclusion:** The workforce is male-dominated, with minimal representation of women and marginalized groups in managerial or technical roles.

**HR Management:** SMEs and informal players lack structured HR policies. Formal contracts are rare, and skill enhancement programs for modern textile technologies, such as automation, are insufficient.

**Procurement:** Heavy reliance on imported machinery and raw materials persists due to inadequate local manufacturing capabilities. Corruption in procurement inflates costs.

**Technology and Workplaces:** Modern technologies are primarily adopted by larger exporters, leaving SMEs reliant on outdated machinery. Workplace safety standards are often ignored, particularly in small-scale units.

## *SWOT-EETH Analysis*

### *SWOT*

#### **Strengths**

- i. **Raw Material Base:** Pakistan benefits from being the fourth-largest cotton producer globally. This provides a steady supply of raw material for the textile industry, giving it a significant cost advantage in the production of cotton-based products.
- ii. **Labor Availability:** The country has a large and affordable labor force, which helps keep production costs low. This is a significant advantage for industries that rely on manual labor, such as weaving, spinning, and garment manufacturing.
- iii. **Established Infrastructure:** Pakistan's textile sector benefits from well-established infrastructure, including textile mills, factories, and related industries. The textile clusters in Faisalabad, Lahore, Karachi, and Multan have a long history and expertise in production.
- iv. **Global Market Access:** Pakistan enjoys preferential access to the European Union market under the GSP+ arrangement, which allows duty-free and quota-free access for many of its textile products.
- v. **Complete Value Chain:** Pakistan has a well-established textile value chain, from cotton production to ginning, spinning, fabric production, dyeing, and garment manufacturing.
- vi. **Government Support:** The government offers various incentives and policies to support the textile industry.
- vii. **Large Domestic Market:** The presence of large domestic market added with a protectionist regime is another Strength of Pakistan's Textile Sector.

#### **Weaknesses**

- i. **Outdated Technology and Machinery:** A major issue in Pakistan's textile sector is the outdated machinery and lack of technological modernization. The sector continues to rely on old production methods, resulting in lower productivity, poor product quality, and an inability to compete in high-value markets.
- ii. **Low Value Addition:** Pakistan's textile industry remains heavily focused on raw material exports such as cotton yarn and fabric. There is minimal focus on adding value through finished products like garments and specialized textiles. This results in lower export earnings compared to competitors who focus on high-value products.

- iii. **Cost of Doing Business:** Though Pakistan has come out of its energy crises, still the high cost of utilities, tariffs on imports of fabric and finished and high operational costs for textile manufacturers is a serious weakness of Energy Sector.
- iv. **Labor Issues:** Although labor costs are low, Pakistan's textile industry faces challenges in terms of worker skill development, working conditions, and compliance with labor laws. This affects productivity and the ability to meet international labor standards.
- v. **Environmental and Sustainability Challenges:** The textile sector in Pakistan is heavily criticized for its poor environmental practices, including water wastage, air pollution, and a lack of adherence to international sustainability standards. This not only affects the environment but also limits market access to eco-conscious global buyers.
- vi. **Dependence on Cotton:** Heavy reliance on cotton makes the industry vulnerable to fluctuations in cotton prices and crop yields.

### Opportunities

- i. **Export Diversification:** There is a growing opportunity to diversify export markets, particularly into emerging economies in Africa, Central Asia, and the Middle East. These markets show increasing demand for affordable textiles and garments.
- ii. **Shift Towards Value-Added Products:** By focusing on value-added products such as garments, technical textiles, and home textiles, Pakistan can increase its export earnings. This shift requires investment in new machinery, design capabilities, and branding.
- iii. **Technological Advancement:** The adoption of modern technology and automation in the textile industry can significantly improve productivity and quality. Investment in **textile machinery modernization** and **Industry 4.0 technologies** such as artificial intelligence (AI) and robotics could enable the sector to compete in global markets with higher value products.
- iv. **Sustainability and Green Practices:** As global demand for sustainable products grows, Pakistan's textile sector has the opportunity to improve its environmental practices. Adoption of eco-friendly technologies and certifications like OEKO-TEX and GOTS could help open new markets and enhance the reputation of Pakistani textiles.
- v. **Government Support and Policies:** The government has started taking measures to boost the textile industry, including textile

policies and incentives for export growth. If effectively implemented, these measures could lead to increased investment, better infrastructure, and a more competitive industry.

### Threats

- i. **Competition from Global Rivals:** Countries like China, India, and Bangladesh offer lower production costs and more advanced technology, creating significant competition for Pakistan's textile exports. Bangladesh, for example, has overtaken Pakistan in garment exports due to its competitive labor costs, better infrastructure, and efficient supply chains.
- ii. **Political Instability and Security Concerns:** Pakistan's textile sector is often affected by political instability, policy changes, and security concerns, which can disrupt manufacturing, exports, and supply chains. This uncertainty can deter foreign investment and affect long-term growth prospects.
- iii. **Global Trade Barriers:** Despite the GSP+ status, Pakistan faces trade barriers, especially in terms of stringent quality standards and non-tariff barriers in international markets. Many countries have moved towards stricter environmental and labor regulations, which could limit Pakistan's access to premium global markets.
- iv. **Climate Change and Cotton Supply Risks:** Pakistan's reliance on cotton as a primary raw material makes the industry vulnerable to climate change, particularly water scarcity, droughts, and pests that affect cotton production. These environmental risks can disrupt the supply chain and raise raw material costs.

### *EETH*

### Enhancement of Strengths

- i. **Complete Value Chain:** Encourage vertical integration within the textile sector to ensure better control over the entire value chain, from raw material production to finished products. Invest in advanced technologies and automation to streamline processes across the value chain, improving efficiency and reducing costs. This shall result in Improved product quality and consistency and enhanced operational efficiency and cost savings.
- ii. **GSP+:** Leverage existing trade agreements like GSP+ and negotiate new ones to secure preferential access to more international markets and by ensuring compliance with international standards and regulations to maintain preferential access and avoid trade barriers, Increased market access and competitiveness along with sustained and potentially expanded benefits from trade agreements can be obtained.

- iii. **Employment Generation:** Implement training and development programs to enhance the skills of the workforce, ensuring they are equipped to handle modern technologies and production techniques. Promote job creation initiatives, especially in rural areas, to provide employment opportunities and reduce urban migration. This shall result in higher productivity and efficiency due to a skilled workforce and improved socio-economic conditions and reduced unemployment rates.
- iv. **Abundant Raw Materials:** Promote sustainable cotton farming practices to ensure a steady and environmentally friendly supply of raw materials. Encourage the use of alternative raw materials like synthetic fibers and blended fabrics to reduce dependency on cotton resulting in ensured long-term availability of raw materials and enhanced environmental sustainability and resilience against fluctuations in cotton supply.
- v. **Cheap Labor:** Improve wages and working conditions to attract and retain skilled labor, while maintaining competitive production costs and implement automation in labor-intensive processes to enhance productivity and reduce reliance on cheap labor resulting in higher job satisfaction and lower turnover rates and increased productivity and competitiveness.
- vi. **Government Support:** Engage in advocacy to influence government policies that further support the textile sector, such as tax incentives, subsidies, and infrastructure development and foster partnerships between the government and private sector to implement initiatives that benefit the textile industry resulting in strengthened policy framework and increased government support and enhanced collaboration and resource allocation for sector development.
- vii. **Large Domestic Market:** Develop strong local brands to capture a larger share of the domestic market. Conduct awareness campaigns to promote locally manufactured textile products, highlighting their quality and affordability which shall result in increased domestic sales and market share and enhanced consumer loyalty and preference for local products.

#### Elimination of weaknesses

- i. **Hurdles in Doing Business:** Simplifying regulatory procedures and reducing bureaucratic red tape can make it easier for businesses to operate. This could lead to increased investment and efficiency in the textile sector. Implementing one-window operations for business registrations and approvals can save time and reduce frustration for entrepreneurs, promoting growth and innovation.
- ii. **Cost of Doing Business:** Providing subsidies and incentives can lower operational costs for textile manufacturers, making them more

- competitive in the global market. Implementing tax reforms to lower the tax burden on businesses can increase profitability and encourage further investment in the sector.
- iii. **Infrastructure Issues:** Investing in improving transportation, logistics, and communication infrastructure can ensure timely delivery of goods, enhancing the sector's reliability and competitiveness. Encouraging public-private partnerships to develop and maintain infrastructure can lead to more efficient and sustainable infrastructure projects.
  - iv. **High Tariffs:** Negotiating favorable trade agreements can reduce tariffs on imports of fabric and finished goods, making it easier to access necessary materials and expand market reach. Implementing policy reforms to lower tariffs can promote trade and increase the competitiveness of the textile sector.
  - v. **Dependence on Cotton:** Encouraging the diversification of raw materials by promoting the use of synthetic fibers and blended fabrics can reduce vulnerability to fluctuations in cotton prices and crop yields. Investing in research and development to improve cotton yields and develop alternative materials can enhance the sector's resilience and innovation.

### Taking advantage of opportunities

- i. **Diversification:** Diversify the product range by including non-traditional textile products, high-value-added items, and blended fabrics. Target different market segments with specialized products, such as technical textiles, fashion textiles, and home textiles. Reduced dependency on traditional cotton products, Increased market opportunities and customer base and higher profitability through value-added products shall be the outcome.
- ii. **Technological Advancements:** Invest in R&D to develop innovative products, improve processes, and stay ahead of industry trends. Adopt digital technologies such as ERP systems, IoT, and data analytics to enhance operational efficiency. This should result in continuous innovation and improvement in product offerings, streamlined operations and better decision-making through data-driven insights and stronger competitiveness in the global market.
- iii. **Sustainability:** Invest in green technologies, renewable energy sources, and waste management systems to minimize environmental impact. Educate consumers about the benefits of sustainable textiles and promote eco-friendly products, which should result in positive environmental impact and compliance with international regulations and attraction of environmentally conscious consumers and markets.

## Hedging against threats

- i. **Energy Shortages:** Develop and invest in renewable energy sources such as solar, wind, and hydroelectric power to reduce dependence on the national grid. Implement programs to improve energy efficiency in textile manufacturing processes, such as energy-saving machinery and practices. Invest in reliable backup power solutions, such as generators and UPS systems, to mitigate the impact of power outages.
- i. **Competition:** Develop strategies to maintain competitive pricing without compromising quality, such as improving production efficiency and reducing waste. Invest in quality control and assurance to enhance the quality of textile products and meet international standards. Explore new markets and diversify the product range to reduce reliance on traditional markets.
- ii. **Environmental Impact:** Adopt sustainable practices such as eco-friendly dyeing and finishing processes, waste reduction, and recycling. Ensure compliance with local and international environmental regulations to avoid penalties and enhance the industry's reputation. Obtain green certifications (e.g., GOTS) to attract environmentally conscious customers and markets.
- iii. **International Competition:** Focus on innovation and product differentiation to stand out in the global market. This can include unique designs, high-quality materials, and value-added services. Form strategic partnerships and alliances with international companies to enhance market access and competitiveness. Leverage favorable trade agreements to reduce tariffs and increase market access.

## ISSUES AND CHALLENGES

- i. **External obligation and challenges in export markets:** The European Union introduced the Corporate Sustainability Due Diligence Directive (CSDDD) in April 2024. Rooted in the United Nations Guiding Principles on Business and Human Rights, CSDDD enforces mandatory human rights and environmental standards for large corporations, extending compliance requirements to their global supply chains. Though Pakistani textile exporters are not directly targeted, their role in European supply chains necessitates adherence to these regulations, set to phase in from 2027. This directive will significantly affect Pakistani textile businesses, compelling them to prioritize sustainable practices and align with global compliance norms to remain competitive.

The new regulations/strategies/directives related to the textile industry introduced in the Green Deal (EU) Strategy on Sustainable and Circular



Textiles, Corporate Sustainability Due Diligence Directive (CS3D) and Carbon Border Adjustment Mechanism (CBAM)) provide detailed guidelines regarding the upcoming requirements from the manufactures/producers. For Pakistan to ensure compliance with the GSP+ obligations for its continuation as well as gain a competitive position in the global export market, it must fully own and fulfill the requirements of the Green Deal and related legislations and directives.

- ii. **Rising energy prices and external shocks:** Textiles, a key economic pillar employing millions and generating significant foreign exchange, face sustainability concerns amid rising energy costs. The IMF's insistence on ending subsidies and aligning energy prices with market rates, as part of its \$7 billion EFF, threatens the sector's competitiveness. A structural benchmark under the program mandates gas disconnections to captive power plants (CPPs) by January 2025, a prerequisite for the \$1 billion tranche in March. Additionally, a proposed Rs 1,700-1,800/mmBtu levy further pressures the industry. Energy costs, a major expense for textile units, already strain margins as Pakistan competes with Bangladesh, Vietnam, and India. Inconsistent and costly energy risks production delays and export commitments, jeopardizing revenue and reserves (Editorial, 2025).
- iii. **Low-Quality Cotton Production:** The inconsistent quality of locally produced cotton, due to outdated farming practices, climate condition and poor pest management, reduces productivity and necessitates costly imports of higher-quality cotton. Pakistan's cotton yield suffers from severe quality issues, with contamination rates over seven times the international standard. Outdated manual picking methods introduce high trash content, leading to significant ginning losses and lower yarn quality. Contamination from plastic strings, due to storage in fertilizer bags, further exacerbates the problem, often becoming apparent only in later processing stages (Ahmad I. , 2020).
- iv. **Outdated Machinery and Technology:** The textile sector in Pakistan struggles with outdated technology and high energy costs, severely impacting its competitiveness against regional players like India and Bangladesh, which have modernized their industries. For example, a Pakistani mill with 25,000 spindles employs 500 workers and consumes 2.6 MW of power, while advanced Indian mills produce more yarn with only 200 workers and 1.5 MW (Ahmad M. , 2015). Lack of investment in capacity expansion and outdated machinery is pushing productivity down, with 50% of textile spindles set to be scrapped.
- v. **High Energy Costs and Shortages:** Frequent power outages, inconsistent gas supply, and high energy tariffs significantly raise production costs, disrupt operations, and undermine the industry's global competitiveness. Textile sector is burdened with high costs and uncertainty over utility prices, harming Pakistan's competitiveness compared to countries like India and Bangladesh, which offer better support to their textile industries (The Nation, 2023).

- vi. **Lack of Diversification:** The industry remains heavily reliant on natural fibers like cotton, with limited focus on man-made fibers (MMFs), which dominate global markets. This limits product innovation and reduces the sector's appeal to international buyers. Pakistan's textile sector, heavily reliant on cotton, is missing a significant growth opportunity in the global shift toward man-made fibres (MMF), which now constitute about 70% of global textile trade. MMF exports in Pakistan account for just 12%, leaving the country sidelined in this expanding market (Mubasal, 2024). Additionally, monopolistic pricing of polyester staple fiber (PSF) limits production and export diversification, further increasing vulnerability to supply shocks.
- vii. **Unskilled Workforce:** A lack of technical training and skill development results in low productivity and inconsistent product quality, affecting the industry's ability to compete with countries like Bangladesh and Vietnam (The Express Tribune, 2011).
- viii. **High Cost of Doing Business:** Complex regulatory processes, high taxes, and delays in tax refunds create financial strain, reducing profitability and discouraging investment in the sector. The stagnation is attributed to rising input costs, particularly electricity and gas prices, which have made exports uncompetitive. Energy tariffs for textile firms have increased from 9 cents/kWh in FY22 to over 14 cents/kWh, further pushing up production costs. Power tariffs have recently been raised again to 17.5 cents/kWh, more than double that of regional competitors like Bangladesh, India, and Vietnam. With gas prices also surging 223% since January 2023, the industry is struggling to maintain production viability. Textile millers warn of further export declines unless the government adopts policies like the Competitive Trading Bilateral Contracts Market (CTBCM) model, which would allow access to cheaper green energy. Energy costs, accounting for 12-18% of textile input costs, are inflated by cross-subsidies, making Pakistan's power tariffs nearly double those of regional competitors. Additionally, the industry calls for increasing the solar net-metering ceiling from 1MW to 5MW for industrial consumers to support the transition to net-zero emissions and boost energy supply (Bhutta, 2024).
- ix. **Competition from Regional Players:** Countries like China, India, and Bangladesh offer lower production costs, better infrastructure, and greater policy support, making them more attractive to global buyers. Pakistan's textile export sector is struggling due to high energy costs, liquidity crises, and poor policy decisions, making it difficult to compete internationally. Bangladesh, for example, has exported more in ready-made garments (\$15.7 billion) in first quarter of 2024 than Pakistan's total exports (\$13.3 billion) (Ali, 2023).

### *Conclusion:*

The textile and apparel industry in Pakistan, a cornerstone of the economy, faces multiple challenges despite its potential to significantly boost export earnings and economic growth. The sector accounts for 50-60% of the nation's exports, but its capacity to contribute further is constrained by several structural and policy-related issues.

Firstly, Pakistan's textile exports are heavily reliant on cotton-based products, comprising over two-thirds of total exports. This focus limits the country's ability to capitalize on the growing demand for man-made fiber (MMF) products globally. Investments in MMF manufacturing are hindered by high import duties on critical inputs like purified terephthalic acid (PTA) and polyester staple fiber (PSF), along with anti-dumping duties, which disincentivize production and export diversification. The lack of growth in MMF exports leaves Pakistan competing for a shrinking market share as global demand for cotton-based products decreases.

The industry also suffers from high energy costs, with power tariffs for industrial consumers being nearly double those in competing regional economies. This issue, coupled with unreliable gas supplies and inadequate renewable energy adoption, significantly raises production costs, rendering exports uncompetitive internationally. Additionally, the withdrawal of regionally competitive energy tariffs (RCET) has further strained the sector.

Liquidity shortages are another critical concern. Persistent delays in tax refunds, exacerbated by the inefficient FASTER system, trap substantial funds that could otherwise be used for operations and investments. Furthermore, the imposition of high sales tax rates and turnover taxes disproportionately affects smaller firms and those involved in upstream processes, deepening financial distress across the sector.

Infrastructure deficits, such as insufficient transport logistics and outdated testing facilities, also impede growth. Lengthy port dwell times, inefficient transport systems, and a lack of domestic testing centers increase costs and delays, making Pakistan's products less competitive. Additionally, inadequate traceability in the supply chain and a limited adherence to international labor and environmental standards pose significant barriers to accessing and retaining key markets, particularly in Europe.

Pakistan's high tariffs and protectionist trade policies have constrained the growth and diversification of its textile industry. By maintaining elevated duties on essential raw materials and imposing complex import procedures, the country has limited its participation in the burgeoning global market for synthetic textiles. To foster a more competitive and export-oriented textile sector, Pakistan may need to reconsider its trade policies, focusing on reducing tariffs, streamlining import processes, and enhancing regional trade cooperation.

## **RECOMMENDATIONS**

### **Technology Upgradation and Modernization**

- Introduce low-interest financing schemes for SMEs to upgrade machinery.
- Implement incentives for the adoption of automation and advanced manufacturing technologies.
- Establish R&D collaboration between universities and textile industry stakeholders.

### **Energy Efficiency and Cost Reduction**

- Introduce regionally competitive energy tariffs for textile industries.
- Encourage the use of renewable energy sources like solar and wind.
- Upgrade infrastructure to reduce power outages and improve reliability.

### **Diversification into Man-Made Fibers (MMF)**

- Reduce import duties on MMF raw materials like polyester staple fiber and purified terephthalic acid.
- Encourage local production of synthetic fibers through public-private partnerships.
- Conduct training programs to facilitate the transition to MMF production.

### **Improved Regulatory and Taxation Framework**

- Simplify the taxation process and introduce one-window operations for exporters.
- Expedite tax refund processes to improve liquidity.
- Enhance transparency and accountability in regulatory procedures.

### **Workforce Skill Development**

- Establish technical training institutes with modern textile-related courses.
- Collaborate with international training organizations for workforce capacity building.
- Introduce mandatory vocational training for workers.

### **Market Diversification and Export Promotion**

- Target new markets in Africa, Central Asia, and the Middle East.
- Conduct branding and marketing campaigns to promote Pakistani textiles globally.
- Utilize trade agreements such as GSP+ and CPFTA to expand market access.

### **Sustainability and Compliance**

- Implement environmental regulations with strict enforcement to meet international standards.
- Provide incentives for adopting eco-friendly practices.
- Develop wastewater treatment and energy-efficient production processes.

**Institutional Strengthening and Governance**

- Strengthen the coordination between TDAP, APTMA, and other relevant institutions.
- Improve the operational efficiency of customs and trade facilitation bodies.
- Introduce digitization to minimize bureaucratic inefficiencies.

**LOG-FRAME MATRIX**

Recommendations	Responsibility	Time Frame	Financial Implication
Technology upgradation and modernization	Ministry of Commerce, APTMA, Private Sector	1-3 years	High
Energy efficiency and cost reduction	Ministry of Energy, Textile Manufacturers	1-2 years	Medium
Diversification into MMF	Ministry of Commerce, FBR	1-2 years	Medium
Improved regulatory framework	FBR, Ministry of Finance, Ministry of Commerce	6-12 months	Low
Workforce skill development	TEVTA, NAVTTC, Textile Associations	2-3 years	Medium
Market diversification and export promotion	TDAP, Trade Missions Abroad	1-2 years	Medium to High
Sustainability and compliance	Environmental Protection Agency, APTMA	1-3 years	High
Institutional strengthening and governance	Ministry of Commerce, FBR, TDAP	Ongoing	Medium

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# Evaluation of Export Sector of Pakistan; Policies, Regulations and Practices

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## Abstract:

The export sector plays a crucial role in Pakistan's economy, driving GDP, industrial growth, and foreign exchange revenues. However, Pakistan's export performance faces significant challenges, including over-reliance on textiles, insufficient diversification, and structural inefficiencies. This paper explores the factors limiting growth, such as regulatory bottlenecks, poor infrastructure, and limited value addition. It identifies promising sectors like IT, pharmaceuticals, and agriculture-based products, which could boost export revenues if developed effectively. To overcome these challenges, a comprehensive policy framework focused on export diversification, infrastructure improvement, and market expansion is necessary. The paper offers actionable recommendations, drawing on international best practices, to modernize Pakistan's export sector, enhance competitiveness, and foster sustainable economic growth. The findings highlight the importance of strategic interventions to transform the sector into a key driver of economic development.

## Key words:

Export Diversification, Industrial Growth, Pakistan Economy, Policy Framework, Trade Competitiveness.

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## *Introduction*

The export sector plays a fundamental role in Pakistan's economy, acting as a crucial driver of economic growth, job creation, and foreign exchange revenue. In the context of a globalized economy, a nation's capacity to competitively export goods and services is essential for maintaining economic stability and promoting sustainable development (Reda Cherif and Fuad Hasanov, 2024). For Pakistan, the export sector presents significant opportunities not only for improving the balance of payments but also for advancing industrialization, boosting productivity, and connecting with global value chains. Despite the acknowledgment of the strategic significance of exports by successive governments over the years, the sector continues to encounter structural challenges that impede its growth.

Pakistan's export sector contributes significantly to the country's gross domestic product (GDP). According to the Pakistan Economic Survey, exports accounted for approximately 8-10% of GDP over the past five years i.e. year 2018 to 2023. This figure underscores the importance of increasing export volumes and diversifying the export base to reduce reliance on external borrowing and improve the trade deficit. With the country's imports consistently exceeding exports, the resulting trade imbalance has placed pressure on foreign exchange reserves and the value of the Pakistani rupee. Strengthening the export sector is, therefore, not just a policy priority but a necessity for achieving macroeconomic stability.

Over the last five years, Pakistan's export performance has exhibited both resilience and challenges. From fiscal year 2018 to 2023, export earnings fluctuated between USD 21 billion and USD 32 billion annually. The textile sector, which accounts for approximately 60% of total exports, has been the backbone of the country's export profile. Key products include garments, bed linens, and cotton yarn, which are primarily exported to markets such as the United States, the European Union, and China. Despite global disruptions caused by the COVID-19 pandemic, the textile sector managed to sustain its performance, largely due to government support measures such as reduced energy tariffs for exporters and the reinstatement of the Generalized Scheme of Preferences (GSP+) status by the EU and the US.

However, Pakistan's export sector remains overly reliant on textiles, leaving other industries underdeveloped and untapped (PBC, 2022). Agriculture-based exports, such as rice, fruits, and vegetables, contribute a modest share to overall exports but hold significant potential for growth. Similarly, the information technology (IT) sector has emerged as a high-potential area, with IT exports surpassing USD 4.2 billion in fiscal year 2024 (PRAL, 2024), a significant increase from previous years. Despite this growth, Pakistan's IT exports remain far below their potential, especially when compared to regional competitors like India and Bangladesh.

Other sectors with untapped potential include pharmaceuticals, engineering goods, and the mining of minerals such as copper and gold (Mulabdic, J. Varela, 2023).

The underutilization of these sectors can be attributed to various factors, including limited value addition, inadequate infrastructure, and a lack of investment in research and development (R&D). Moreover, Pakistan's exporters face challenges such as inconsistent energy supply, regulatory bottlenecks, and limited access to international markets. Addressing these issues requires a comprehensive policy framework that prioritizes export diversification, enhances product quality, and fosters innovation.

To unlock the full potential of Pakistan's export sector, strategic interventions are required. Pakistan has the ingredients to transform its export sector into a driver of economic prosperity. This situation requires that policymakers must adopt a forward-looking approach to harness this potential and ensure sustainable growth for the nation's economy.

### ***Problem Statement***

The export sector serves as a fundamental component of Pakistan's economy, significantly contributing to foreign exchange generation, fostering industrial development, and facilitating economic advancement. However, the export sector has experienced stagnation for an extended period, with exports failing to expand despite the belief that its potential has yet to be fully tapped. Therefore, there is need to critically examines the current state of Pakistan's export sector, analyzing existing policies, regulations, and institutional frameworks to offer practical recommendations aimed at achieving sustainable growth.

### ***Scope of the Study***

This research investigates the present condition of Pakistan's export sector. It evaluates the legal and institutional frameworks, highlighting their strengths and weaknesses. Utilizing a SWOT-EETH analysis, the study assesses the regulatory bodies involved, such as the Ministry of Commerce the Trade Development Authority of Pakistan and Federal Board of Revenue, while also examining governance and service delivery through the Blavatnik School of Government's Oxford Index of Public Administration (OIPA). Furthermore, the research includes comparative analyses with successful export nations like India and Vietnam to pinpoint deficiencies and extract actionable insights. The study also benchmarks Pakistan's export practices against international standards, offering specific recommendations and a practical implementation strategy aimed at improving the sector's growth, competitiveness, and sustainability.

### ***Research Methodology***

The following methodologies have been used for research.

- Mixed methods have been applied.
- Secondary data (qualitative & quantitative)
- Acts, Regulations, Policies and Projects
- Field visit of TDAP office in Peshawar and Zoom Meetings (Additional Secretary Trade Policy, Ministry of Commerce, and Ex. Member Customs, Federal Board of Revenue)
- Articles, Journals and Websites

### ***Literature Review***

Over the years, various studies have been conducted to evaluate the performance, challenges, and policy frameworks of Pakistan's export sector. This literature review highlights the findings from academic and policy-oriented research to provide a comprehensive understanding of the subject.

#### ***Export Sector Performance and Trends:***

The reduction in exports is regarded as a primary factor contributing to the increasing trade deficit of Pakistan, a persistent challenge that the nation has encountered since the onset of the century. Over the past twenty years, the share of exports in the country's GDP has decreased from 16% to 10% (World Bank, 2021). The economic survey 2024 highlights that the country's export base is highly concentrated, with textiles constituting over 60% of total exports. This reliance on a single sector makes the economy exposed to global demand fluctuations. A research study also point out that limited export diversification is a significant barrier to achieving sustainable growth (Maha Khan and Uzma Afzal, 2016).

#### ***Policy Framework and Effectiveness:***

The Government of Pakistan has implemented various policy measures to promote exports, including the Strategic Trade Policy Framework (STPF), Export Finance Scheme, Export Facilitation Scheme etc. and sector-specific incentives. According to the Pakistan Economic Survey (2023), these initiatives aim to enhance competitiveness, improve market access, and encourage value addition. However, lack of policy coherence and inadequate implementation mechanisms often undermine these efforts (Afia, Ejaz, 2017). Moreover, the frequent changes in trade policies create uncertainty, discouraging long-term investment in export-oriented industries.

#### ***Regulatory Environment:***

Studies emphasize that Pakistan's regulatory framework poses significant challenges to exporters. World Bank's Doing Business Report (2023) identify the cumbersome procedures, inefficient customs operations, and poor enforcement of intellectual property rights as critical barriers.

These factors increase the cost of doing business and reduce the competitiveness of Pakistani exports in global markets. Furthermore, the World Bank's Doing Business Report (2023) ranks Pakistan at 108th position out of 190 in terms of trade facilitation, indicating the need for substantial reforms.

### *Practices and Private Sector Role*

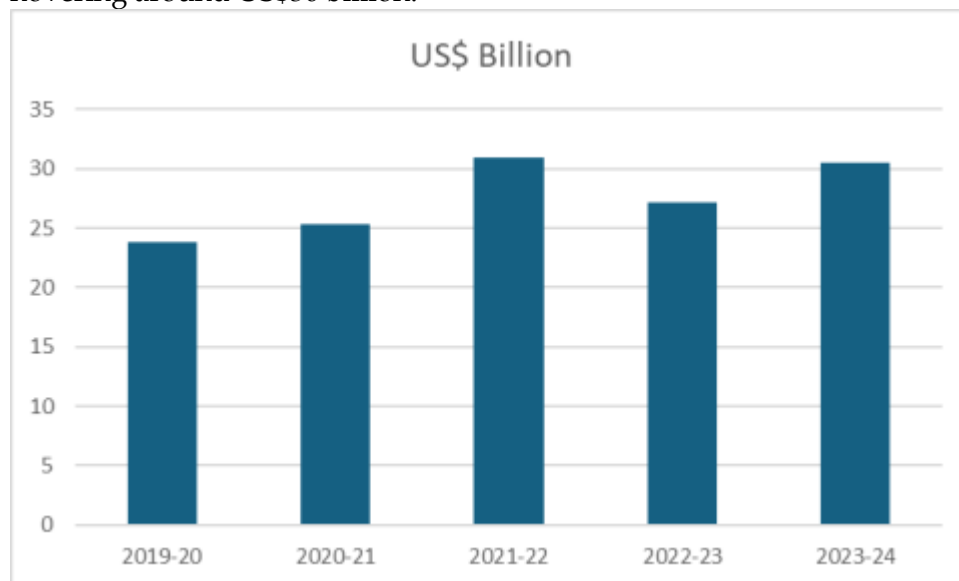
The private sector's contribution to the export sector is significant, but challenges such as limited access to finance and inadequate infrastructure affect its potential. Asian Development Bank emphasized the importance of enhancing collaboration between the public and private sectors to address these issues. Additionally, (Ali Mufti, Imran Ali, 2024) highlight the role of export-oriented small and medium enterprises (SMEs) in driving growth but note their struggles with scaling operations due to limited policy support.

Global Market Dynamics and Competitiveness:

Pakistan's export sector faces intense competition from regional players like India, Bangladesh, and Vietnam. Pakistan's inability to adapt to changing global market trends, such as demand for high-value and environmentally sustainable products, has resulted in declining market shares (Asif Mehmood, Waqas Ahmad, 2017). The absence of innovation and technology adoption further worsens this issue.

#### *1.1 Current Status of Pakistan Export Sector:*

During the last five years the exports of Pakistan achieved its highest level in 2021-22 when the exports were US\$30.9 billion and since then it was hovering around US\$30 billion.



Source: Pakistan Customs

Pakistan's exports data reveal that its base is quite narrow, highly concentrated in a few commodities namely, textile and clothing, leather, rice,

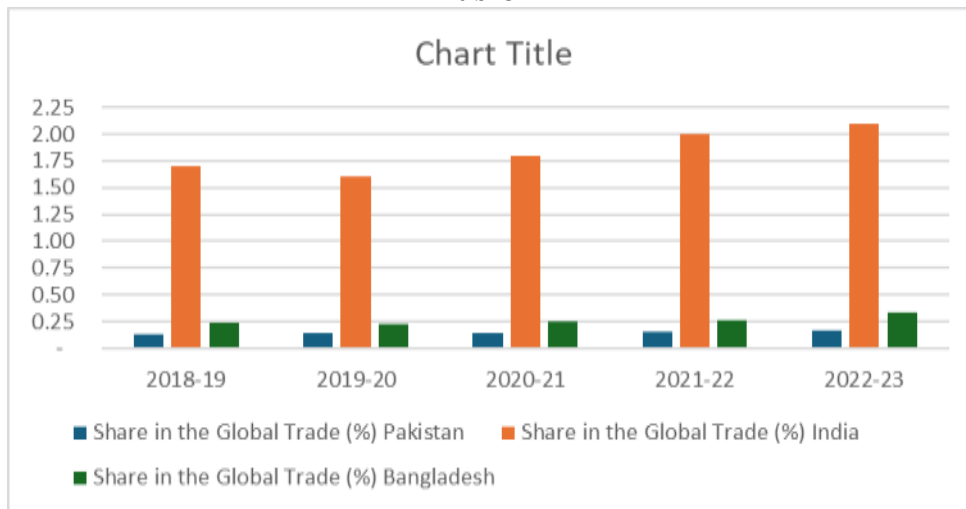


**Table-IV****Exports to the World (US\$ Billion)**

Year	Pakistan	India	Bangladesh
2018-19	22.50	529.00	40.50
2019-20	23.82	498.00	38.80
2020-21	25.30	672.00	45.40
2021-22	30.90	751.00	52.10
2022-23	27.10	776.00	67.00

*Source: ITC Trademap*

The share of the Pakistan exports in the global trade as compared to its regional countries remained as follows.

**Table-V***Source: ITC Trademap*

### **1.2 Legal and Institutional Framework:**

The Constitution of Pakistan provides the foundation for a legal framework that supports and promotes trade. Specifically:

- **Article 18:** This article guarantees the right to freedom of trade, business, and profession. This fundamental right ensures that individuals and businesses can engage in trade activities without undue restrictions.
- **Article 161:** This article empowers the Federal Government to regulate foreign trade and commerce. This authority allows the government to enact laws and policies that streamline trade procedures and reduce barriers to trade.
- **Article 162:** This article grants the Federal Government the power to establish and regulate corporations. This power can be used to create and oversee institutions that promote trade and investment, such as the Trade Development Authority of Pakistan (TDAP).

While these constitutional provisions do not directly address trade facilitation, they create a legal framework that enables the government to implement policies and initiatives that support and promote trade. The specific laws and regulations related to trade facilitation are typically enacted by the Federal Government under its powers to regulate foreign trade and commerce.

### ***1.3 Key Policies, Regulations for Export Development in Pakistan:***

Following are the main policy level interventions by the Government for the export development and promotion in Pakistan

- **Strategic Trade Policy Framework (STPF) (2020-25):**  
This framework provides a roadmap for enhancing exports by focusing on market access, diversification, and incentives. It prioritizes specific sectors to improve their productivity and competitiveness.
- **Export Policy Order (EPO) (2022):**  
The Export Policy Order outlines guidelines for export operations and establishes regulatory mechanisms for export procedures.
- **National Tariff Policy (NTP) (2019-24):**  
The NTP focuses on rationalizing tariffs to make raw materials and intermediate goods more affordable for exporters. It aims to promote value addition and discourage the export of raw materials.
- **Export Facilitation Scheme (EFS):**  
The scheme is emphasized on providing duty drawbacks for the inputs for the export-oriented units.
- **Export Finance Scheme:**  
Managed by the State Bank of Pakistan, the EFS provides short-term financing to exporters at concessionary rates.
  - **Long Term Financing Facility (LTFF):**  
Managed by SBP, under LTFF, Participating Financial Institutions (PFIs) provide long term local currency finance at a concessional rate of 6% as compared to normal KIBOR (which is higher) for purchase of plant and machinery to be used by the export-oriented projects meeting specified criteria.
- **Duty Drawback of Taxes (DDT):**  
Exporters are reimbursed for taxes and duties paid on inputs used for exportable products.
  - **Free Trade Agreements (FTAs) and Preferential Trade Agreements (PTAs):**  
Pakistan has signed FTAs and PTAs with countries like China, Malaysia, Sri Lanka, and Indonesia, offering preferential access to various markets.

- **Customs Act, 1969:**

This act regulates customs procedures and provides the legal framework for import and export operations.

#### ***1.4 Analysis of the Legal and Policy Framework Governing Pakistan's Export Sector:***

Pakistan's export sector operates under above mentioned legal and policy frameworks. These policies have been developed to facilitate trade, minimize obstacles, and improve competitiveness in international markets. Although these policies provide the basis for development, however, there are challenges associated with the effectiveness of these policies in development and promotion of exports from Pakistan. The analysis given below discuss the strengths and weaknesses of these policy and legal frameworks and identifies the reforms that could enhance the potential of Pakistan's export sector.

**Table-VI**

Framework/Policy	Strengths	Weaknesses	Reforms Needed
<b>Strategic Trade Policy Framework (STPF)</b>	<ul style="list-style-type: none"> <li>• Provides a comprehensive roadmap for export growth, focusing on market access and diversification.</li> <li>• Identifies priority sectors for export enhancement, such as textiles and IT services.</li> <li>• Incorporates performance-based incentives to encourage exporters.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of consistent implementation due to frequent policy changes and political instability (Khan, 2020)</li> <li>• Insufficient monitoring and evaluation mechanisms to track progress against objectives.</li> <li>• Limited integration with industrial and investment policies.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure policy consistency by aligning STPF with industrial and investment policies (Khan, 2020)</li> <li>• Establish robust monitoring and evaluation mechanisms to track policy outcomes effectively at federal as well as provincial and district level like China.</li> </ul>
<b>Export Policy Order (EPO)</b>	<ul style="list-style-type: none"> <li>• Simplifies export procedures and sets clear regulatory guidelines for exporters.</li> <li>• Focuses on promoting non-traditional exports and value-added products.</li> </ul>	<ul style="list-style-type: none"> <li>• Overlaps with other trade-related policies, creating confusion for exporters.</li> <li>• Limited awareness among SMEs about the benefits and provisions of the policy.</li> </ul>	<ul style="list-style-type: none"> <li>• Simplify regulatory overlaps and increase awareness through targeted outreach programs (Ahmad, 2022).</li> </ul>



<b>National Tariff Policy</b>	<ul style="list-style-type: none"> <li>• Aims to create a predictable and rationalized tariff structure to promote industrial growth.</li> <li>• Focuses on reducing tariffs on raw materials and intermediate goods to lower production costs</li> </ul>	<ul style="list-style-type: none"> <li>• Tariff anomalies persist, with high tariffs on input for key export industries (Pasha, 2021).</li> <li>• industries are still facing high costs due to non-tariff barriers as the non-tariff barriers have not been rationalized in the NTP.</li> </ul>	<ul style="list-style-type: none"> <li>• There is need to address tariff anomalies and enforcement of tariff reductions effectively. Further, the non-tariff barriers must also be addressed in the NTP (Pasha, 2021).</li> <li>• Develop a rationalized tariff structure to support long-term industrial growth (World Bank, 2020).</li> </ul>
<b>Export Facilitation Scheme</b>	<ul style="list-style-type: none"> <li>• Encourages SMEs to participate in exports through incentives and streamlined procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited adoption by SMEs due to lack of awareness and bureaucratic hurdles.</li> <li>• Complex application procedures reduce its effectiveness (Ahmad, 2022).</li> <li>• Operational misuse by the importers and issues of monitoring.</li> <li>• EFS discourages industrial manufacturing and consciously encourages imports &amp; trading.</li> </ul>	<p>Simplify application procedures and provide training programs for SMEs to enhance adoption (Ahmad, 2022).</p>
<b>Export Finance Scheme (EFS) and Long-Term Financing Facility (LTFF)</b>	<ul style="list-style-type: none"> <li>• Provides low-cost financing to exporters to improve liquidity and competitiveness.</li> </ul>	<ul style="list-style-type: none"> <li>• Access is skewed towards large firms, with SMEs often excluded due to stringent requirements (World Bank, 2020).</li> </ul>	<ul style="list-style-type: none"> <li>• Expand access for SMEs by relaxing collateral requirements and reducing administrative delays (World Bank, 2020).</li> </ul>
<b>Duty Drawback of Taxes</b>	<ul style="list-style-type: none"> <li>• Encourages investment in export-oriented industries through long-term credit.</li> </ul>	<ul style="list-style-type: none"> <li>• High administrative costs and delays in disbursements reduce the scheme's effectiveness.</li> </ul>	<ul style="list-style-type: none"> <li>• Introduce transparent refund mechanisms and expedite processing times to address liquidity issues (Khan, 2020).</li> </ul>
<b>Free Trade Agreements (FTAs)</b>	<ul style="list-style-type: none"> <li>• Enhance market access for Pakistani exports in key regions, such as China and Malaysia.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited utilization of FTAs due to non-tariff barriers and insufficient export readiness.</li> <li>• Trade imbalances persist, with</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on resolving non-tariff barriers and enhancing export readiness to fully utilize FTAs (Hussain, 2019)</li> <li>• Conduct regular</li> </ul>

	<ul style="list-style-type: none"> <li>• Reduce tariff barriers, making Pakistani products more competitive.</li> </ul>	Pakistan importing more than it exports under most agreements (Hussain, 2019).	reviews to address trade imbalances effectively (Ahmad, 2022).
<b>Customs Act, 1969</b>	<ul style="list-style-type: none"> <li>• Provides a comprehensive legal framework for regulating customs operations and facilitating trade.</li> <li>• Includes provisions for modernizing customs processes through automation i.e. WEBOC and PSW.</li> </ul>	<ul style="list-style-type: none"> <li>• Outdated provisions i.e. valuation rules, inspection procedures, documentation and dispute resolution conflict with modern trade requirements, slowing down clearance processes.</li> <li>• Corruption and inefficiency in customs operations increase the cost of exporting (Transparency International, 2021).</li> </ul>	<ul style="list-style-type: none"> <li>• Modernize outdated provisions and strengthen anti-corruption measures in customs operations (Transparency International, 2021).</li> <li>• Introduce automation in valuation methods and streamline dispute resolution frameworks.</li> </ul>

### ***1.5 Institutions Responsible for Export Development and Promotion:***

The key institutions which are directly and indirectly are involved in for the export development and promotion in Pakistan are as follows.

- **Ministry of Commerce (MOC):**  
MOC Formulates trade policies and negotiates trade agreements. Ensures policy alignment with national economic goals. The policies include EPO, STPF, EFS and NTP.
- **Trade Development Authority of Pakistan (TDAP):**  
TDAP is Mandated to promote and facilitate exports through trade fairs, market research, and capacity-building programs. Provides export intelligence and matchmaking services to exporters. TDAP is the custodian of STPF under the administrative umbrella of MOC.
- **State Bank of Pakistan (SBP):**  
SBP offers financial support through schemes like the Export Finance Scheme and regulates foreign exchange policies to support exporters.
- **Pakistan Customs (Federal Board of Revenue):**  
FBR facilitates trade by streamlining customs processes and implementing the customs-related provisions of trade agreements.
- **Small and Medium Enterprises Development Authority (SMEDA):**  
SMEDA is mandated to support SMEs in accessing export markets and improving their competitiveness through training and advisory services.
- **Pakistan Software Export Board (PSEB):**  
Focuses on the promotion of IT and software exports by supporting companies in market development and capacity building.

### ***1.6 SWOT and EETH Analysis of Organizations Regulating Pakistan's Export Sector:***

The above listed organizations play a crucial role in enhancing the efficiency and competitiveness of Pakistan's export sector on a global scale. The following analysis will assess the strengths, weaknesses, opportunities, and threats (SWOT) associated with these institutions with respect to export development and promotion, along with recommendations for reforms utilizing the EETH framework (Enhancement of strengths, Elimination of weaknesses, Taking advantage of opportunities, and Hedge against threats);

**Table-VII**

<b>1. Ministry of Commerce</b>			
<b>SWOT Analysis</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Formulation of trade policies by focusing on diversification and growth strategies.	Limited inter-agency coordination with other export-promotion bodies.	Expanding FTAs and PTAs with emerging markets i.e. Brazil, South Korea, South Africa, Poland.	Vulnerability to political instability impacting policy continuity.
	Weak implementation mechanisms for policy enforcement (Khan, 2020).	Promoting regional trade integration under initiatives like CPEC and trade integration with central Asian states.	Global economic slowdowns affecting trade negotiations.
<b>EETH Analysis</b>			
<b>Enhancement of Strengths</b>	<b>Elimination of Weaknesses</b>	<b>Taking Advantage of Opportunities</b>	<b>Hedge Against Threats</b>
Strengthen inter-agency collaboration for cohesive export promotion.	Implement capacity-building initiatives to address weak enforcement.	Leverage CPEC to build trade corridors with other neighboring states i.e. CAS.	Institutionalize long-term trade agreements to withstand political changes.
Develop more comprehensive trade agreements with a focus on non-traditional markets.	Establish monitoring frameworks to ensure effective execution of policies.	Target trade partnerships in Africa and Central Asia for diversification.	Diversify export markets to reduce dependency on limited regions.
<b>2. Trade Development Authority of Pakistan</b>			
<b>SWOT Analysis</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Arrangement and participation in trade exhibitions and promotional activities.	Insufficient budget and resources to effectively implement initiatives (Ahmed, 2022).	Collaboration with international trade bodies to improve market access.	Over-reliance on traditional sectors like textiles.
Provides market intelligence to exporters.	Limited outreach to SMEs and non-traditional sectors.	Enhancing participation in global trade fairs.	Global competition in non-traditional sectors like IT and engineering.
<b>EETH Analysis</b>			
<b>Enhancement of Strengths</b>	<b>Elimination of Weaknesses</b>	<b>Taking Advantage of Opportunities</b>	<b>Hedge Against Threats</b>

Increase budget allocations to expand promotional activities.	Enhance resource allocation for better implementation of trade fairs.	Strengthen the partnerships with global trade organizations for technical assistance.	Diversify the export base to include IT, pharmaceuticals, Chemicals, Gems, Minerals, Seafood through blue economy, meat, agriculture products and engineering goods.
Introduce digital platforms for wider exporter outreach.	Develop specific outreach programs targeting SMEs.	Boost non-textile exports through targeted trade fairs.	Invest in capacity-building programs for emerging sectors.
<b>3. State Bank of Pakistan</b>			
<b>SWOT Analysis</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Provides financial schemes like the Export Finance Scheme and Long-Term Financing Facility .	Limited access to financing for SMEs (World Bank, 2020).	Expanding credit facilities for IT and other emerging sectors.	Interest rate hikes impacting local financing schemes.
Regulates foreign exchange policies to facilitate exporters.	High administrative hurdles and delays in disbursements.	Partnering with private banks for better outreach.	Currency volatility affecting export earnings.
<b>EETH Analysis</b>			
<b>Enhancement of Strengths</b>	<b>Elimination of Weaknesses</b>	<b>Taking Advantage of Opportunities</b>	<b>Hedge Against Threats</b>
Expand financing schemes to include emerging sectors like IT and renewable energy.	Simplify application procedures for export financing schemes.	Offer tailored financial products for high-growth industries.	Implement hedging mechanisms to protect exporters against currency fluctuations.
Improve the accessibility of financial products to SMEs.	Partner with private banks to expand outreach.	Promote public-private partnerships to boost export financing.	Align financing rates with global trends to remain competitive.
<b>4. Federal Board of Revenue</b>			
<b>SWOT Analysis</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
Streamlines customs and tax refund processes.	Corruption and inefficiencies in customs operations (Transparency International, 2021).	Modernizing customs through digitization.	Resistance to reform from entrenched interests.
Implement trade facilitation policies like the Export Facilitation Scheme.	Delays in processing tax refunds for exporters.	Adopting blockchain for secure and transparent trade documentation.	Regional competitors are offering faster trade facilitation.

EETH Analysis			
Enhancement of Strengths	Elimination of Weaknesses	Taking Advantage of Opportunities	Hedge Against Threats
Complete automation of tax and customs processes to reduce delays.	Introduce transparent customs operations using blockchain technology.	Launch nationwide digitization initiatives to improve customs processes.	Develop a reform strategy to engage stakeholders and minimize resistance.
Provide exporters with real-time support through digital tools.	Reduce bureaucratic layers to speed up refund processes.	Train staff in emerging technologies for trade facilitation.	Benchmark processes against competitors to improve service quality.
<b>5. Small and Medium Enterprises Development Authority</b>			
SWOT Analysis			
Strengths	Weaknesses	Opportunities	Threats
Supports SMEs with training and capacity-building programs.	Limited funding restricts its outreach.	Enhancing collaboration with TDAP for SME export promotion.	SMEs face high barriers to entry in global markets due to competitiveness issues.
Provides advisory services for export readiness.	Lack of focus on sector-specific export strategies (Ahmed, 2022).	Targeting high-potential sectors like IT and organic agriculture.	Poor adoption of modern business practices by SMEs.
EETH Analysis			
Enhancement of Strengths	Elimination of Weaknesses	Taking Advantage of Opportunities	Hedge Against Threats
Expand sector-specific training for high-potential industries.	Advocate for increased government funding.	Use partnerships with TDAP to amplify export-related initiatives.	Subsidize entry costs for SMEs to access international markets and increase competitiveness through sector specific incentives
Increase collaboration with international SME development programs.	Design targeted programs for sectors like IT and organic agriculture.	Develop export clusters for specialized industries.	Conduct awareness campaigns on modern trade practices.
<b>6. Pakistan Software Export Board</b>			
SWOT Analysis			
Strengths	Weaknesses	Opportunities	Threats
Focused to promote IT exports.	Limited integration with global IT trade bodies.	Expanding global partnerships in IT.	Intense competition from established IT hubs like India and the Philippines.
PCEB Facilitates capacity-building and market linkages for IT firms.	Small budget relative to the sector's potential.	Enhancing digital infrastructure to support IT exports.	Lack of global certifications for Pakistani IT firms.
EETH Analysis			
Enhancement of Strengths	Elimination of Weaknesses	Taking Advantage of Opportunities	Hedge Against Threats

Promote global certifications for IT professionals to enhance credibility.	Increase funding for PSEB to meet industry demands.	Attract foreign investments to enhance infrastructure.	Focus on niche markets where Pakistan has a comparative advantage.
Facilitate high-value projects through government and private sector collaboration.	Build stronger relationships with global IT trade organizations.	Market Pakistan as a competitive IT outsourcing hub.	Invest in global marketing campaigns to enhance Pakistan's IT image.

## **2. Evaluation of Public Administration in Pakistan's Export Sector Using OIPA Framework:**

The Oxford Index of Public Administration (OIPA) provides a structured approach to assess public administration, governance, and service delivery. This evaluation applies the OIPA framework to analyze the effectiveness, efficiency, and inclusiveness of Pakistan's governance and public administration systems in relation to the export sector. The relevant institutions in this regard have been assessed using OIPA index:

### **2.1 Effectiveness:**

The term effectiveness measures how well the objectives of governance and administration are achieved. It emphasizes the importance of determining whether the goals set by governance bodies are met successfully and whether the strategies employed are delivering the intended outcomes. The said criteria focus on aligning resources, processes, and policies to achieve desired results efficiently and effectively. An analysis of the relevant institutions in this regard is given below;

**Table-VIII**

<b>Organization</b>	<b>Strength</b>	<b>Challenges</b>
Ministry of Commerce	Comprehensive trade policies such as STPF, NTP and bilateral agreements are key contributions. These policies lay the groundwork for export growth. For example, the trade agreement with China under CPEC has facilitated market access for textiles and agricultural products	Weak implementation mechanisms, lack of accountability, and inconsistent monitoring hinder policy success. For instance, the delayed execution of the Strategic Trade Policy Framework (STPF) 2020-25 has led to missed export targets and underutilization of trade agreements, highlighting gaps in effective policy follow-through (Khan, 2020).
TDAP	Organizes trade fairs and offers market intelligence, such as the annual Expo Pakistan event, which has attracted international buyers and fostered new trade relationships. According to a report by the Ministry of Commerce (2021), the event generated over \$1 billion in export orders from international clients.	Limited outreach to exporters in emerging and non-traditional sectors, coupled with inadequate resource allocation, hampers the effectiveness of TDAP's initiatives in diversifying exports (Ahmad, 2022).

Federal Board of Revenue	Initiatives like web-based One Customs (WeBOC) digitize customs processes, reducing clearance times by up to 40% for Karachi port exporters.	Corruption and inefficiencies in customs operations persist, affecting service delivery (Transparency International, 2021).
State Bank of Pakistan	Provides export financing through schemes like EFS and LTFF. The financing provided to textile exporters in Faisalabad resulted in 12% increase in regional exports in 2022.	Administrative delays, such as processing times of up to 6 months for Export Finance Scheme (EFS) applications, and documentation bottlenecks in Long-Term Financing Facility (LTFF) approvals reduce the efficiency of these schemes (World Bank, 2020).
SMEDA	Offers training programs and advisory services for SMEs, focusing on export readiness. Its "Export Awareness Campaign" in southern Punjab in 2022 trained over 500 small businesses on export documentation.	Inadequate focus on sector-specific needs, such as addressing the unique challenges faced by textile hubs in Faisalabad or agricultural exporters in Sindh, and lack of outreach to remote regions, including Baluchistan and northern areas where export potential remains untapped i.e. Copper and gems etc.
PSEB	Promotes IT exports and capacity-building initiatives for the tech industry. Its 2021 "IT Startup Incubation Program" supported 50 new startups, 20 of which successfully entered international markets.	Insufficient budget restricts the ability to scale initiatives like the "IT Startup Incubation Program," which in 2021 supported only 50 startups compared to demand. Limited integration with global IT markets, such as North America (Silicon Valley), Europe, and East Asia (Japan, South Korea), prevents access to high-value IT projects. Furthermore, the IT freelancers face difficulties in global payment systems. Notably the absence of PayPal in Pakistan and limited access to advanced technical training, which reduces their competitiveness in global markets.

## 2.2 Efficiency:

The term efficiency assesses the allocation and utilization of resources in the provision of export-related services, emphasizing the reduction of waste and the enhancement of productivity. The analysis given below assesses whether the key institutions related to export sector development effectively utilize their financial, human, and technological resources to foster export growth, minimize administrative delays, and improve service delivery to various stakeholders;



**Table-VIII**

<b>Organization</b>	<b>Strength</b>	<b>Challenges</b>
Ministry of Commerce	Efficient utilization of trade promotion resources, including focused capacity-building programs for exporters. For example, the TDAP's collaboration with the EU-funded TRTA II program successfully implemented SPS (Sanitary and Phytosanitary) compliance measures, leading to a significant increase in the acceptance rate of Pakistani mangoes in the EU market, as documented by the International Trade Centre (ITC) report, 2021.	High bureaucratic oversight, lengthy approval processes and inadequate delegated decision-making reduce efficiency. This is evident in the delays in actualizing the benefits of Export Facilitation Scheme, which impacts on exporter's ability to access streamlined processes.
TDAP	Managing limited resources for capacity-building programs, such as exporter training workshops, which equip small businesses with essential skills for global trade. TDAP also manages data collection and market intelligence dissemination effectively, helping exporters make informed decisions without requiring extensive government funding.	Inadequate funding limits its ability to scale initiatives like regional trade fairs and exporter capacity-building programs. Additionally, the lack of digital tools to streamline internal processes reduces operational efficiency, leading to delays in program execution. A lack of resources for regional trade fairs reduces accessibility for exporters in Baluchistan and Khyber Pakhtunkhwa.
Federal Board of Revenue	implemented several initiatives to enhance the efficiency of customs processes and improve compliance among exporters like Compliance Risk Management (CRM) and digital platform like WEBOC.	Delays in tax refund processing, such as those experienced by industrial exporters, and systemic redundancies increase costs for exporters.
State Bank of Pakistan	Ensures liquidity for exporters through financial schemes. A case in point is the Export Finance Scheme, which provided \$500 million in 2022 to textile exporters, boosting production.	Administrative delays in disbursements and high procedural barriers for SMEs, particularly in the manufacturing sector.
SMEDA	Provides targeted support for SMEs for export readiness. For instance, the "SME Export Development Project" in Gilgit-Baltistan has helped local businesses enter niche markets like organic apricots and cherries.	Insufficient outreach to underserved regions reduces its inclusivity and efficiency, particularly in southwestern Baluchistan where export potential is untapped.
PSEB	Facilitates IT skill development and creates market linkages for exporters. In 2021, it supported 15 IT startups in gaining contracts in North America, according to the Pakistan Software Export Board's Annual Report 2021.	Limited adoption of advanced technologies to enhance service delivery. For example, a lack of integrated CRM systems has slowed engagement with international clients by making it difficult to track client interactions, respond to inquiries

		promptly, and provide tailored solutions. This has particularly impacted smaller IT firms seeking long-term contracts with North American and European markets.
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### 2.3. Inclusiveness:

The concept of inclusiveness evaluates governance systems, specifically assessing how well they address the needs of different stakeholders. It ensures that all segments of society, including marginalized and underrepresented groups, benefit equitably. In the context of Pakistan's export sector, inclusiveness involves providing equal opportunities for small businesses, rural exporters, women-led enterprises, and less-developed regions to participate in and benefit from export activities. By focusing on inclusivity, governance systems can unlock untapped potential and foster sustainable economic growth. In this regard, an analysis is given below to evaluate the inclusiveness of Pakistan's export sector development organizations:

**Table-IX**

Organization	Strength	Challenges
Ministry of Commerce	Develop inclusive trade policies aimed at regional balance. The Special Economic Zones under CPEC have prioritized less-developed areas like Gwadar for export-driven growth.	Limited execution of inclusive measures in implementation, particularly in ensuring equitable access for smaller regions such as Gilgit-Baltistan and Baluchistan, where logistical barriers and inadequate infrastructure further exacerbate the issue of regional inequality in accessing export opportunities.
TDAP	Promotes regional participation in trade fairs. For example, regional exporters from Khyber Pakhtunkhwa were given exhibition space in Expo Pakistan 2022.	Limited programs targeting emerging and potential sectors for exports, such as chemical, minerals, gems, organic agriculture and handicrafts from remote areas like Gilgit-Baltistan, where organic apricot and cherry production remains untapped, and Sindh, which has potential in traditional handicrafts like Ajrak and Sindhi embroidery. These regions face inadequate support in accessing global markets through TDAP initiatives.
Federal Board of Revenue	Simplifies processes for exporters in mainstream sectors. In addition to streamlining customs clearance, the WeBOC system integrates trade documentation, reducing errors and delays for exporters	Inequitable focus on traditional sectors, leaving emerging sectors underserved. For example, exporters of IT services often face higher scrutiny in tax documentation, delaying processes.

	across multiple industries, including pharmaceuticals and agriculture.	
State Bank of Pakistan	Offers financing schemes accessible to a broad spectrum of exporters. According to the State Bank of Pakistan's Annual Report 2022, its initiative to provide collateral-free loans for women entrepreneurs facilitated access to over PKR 5 billion in credit, marking a significant step towards inclusivity.	SMEs and startups often face challenges accessing these schemes due to stringent collateral and documentation requirements, particularly in high-risk areas like Gilgit-Baltistan, where financial infrastructure is underdeveloped, and logistical barriers further limit access to credit and support programs.
SMEDA	Provides specialized programs for SME growth. For example, the "Digital Literacy Training Programme" has trained over 200 women entrepreneurs, equipping them with essential digital skills to expand their online presence, access e-commerce platforms, and enhance business growth (The News)	Limited focus on marginalized groups, such as rural businesses and women-led enterprises in Sindh and Baluchistan. For instance, women entrepreneurs in rural Sindh often lack access to digital training programs and e-commerce platforms, while agricultural SMEs in Baluchistan face logistical barriers and inadequate marketing support to connect with national and international markets
PSEB	Promotes IT exports and skill development for youth. Its "Freelancers Capacity Building Program" trained over 5,000 individuals, including women, on digital platforms like Fiverr and Upwork, as reported at program website.	Lack of inclusivity in targeting rural freelancers as they often lack access to reliable internet, and targeted training programs that address platform-specific skills for marketplaces like Fiverr and Upwork, limiting their ability to compete in global markets.

### ***3. Gap Analysis: Comparing Pakistan's Export Sector with Vietnam and Bangladesh:***

In the year 2000, Pakistan's share of global exports was around 0.18%, Bangladesh was 0.06% and Vietnam was 0.14%. Currently, Pakistan's export share of the world's total exports has declined from 0.18% to 0.13%, Bangladesh's export share of the world's total exports has increased from 0.06% to 0.19% and Vietnam's export share of the world's total exports has increased from 0.14% to 1.17%. reaching to the level of 345 Billion US\$.

Vietnam and Bangladesh have emerged as prominent players in the global export market, by leveraging targeted policies, sector-specific incentives, and robust institutional frameworks to drive their export growth. Vietnam's success in attracting foreign direct investment (FDI) for high-tech industries like electronics and Bangladesh's dominance in ready-made garments (RMG) highlight the effectiveness of strategic government interventions. In contrast, Pakistan's export sector faces persistent challenges. This analysis

identifies specific measures taken by Vietnam and Bangladesh to strengthen their export sectors and highlights Pakistan's shortcomings, offering actionable recommendations to address these gaps. By adopting proven strategies from these countries, Pakistan can enhance its global competitiveness and achieve sustainable export-led growth.

**Table-X**

	Vietnam	Bangladesh	GAP in Case of Pakistan
<b>Strategy and Leadership</b>	<p>A centralized export strategy under Vietnam's Socio-Economic Development Strategy (SEDS) 2021-2030 integrates FDI, trade facilitation, and infrastructure investments.</p> <p>Strategic leadership attracted tech giants like Samsung and Intel, establishing Vietnam as an electronics hub.</p> <p>Vietnam's electronics exports grew by 250% over a decade, reaching 40% of total exports by 2021 (World Bank, 2021).</p>	<p>Bangladesh's Export Policy 2018-21 included a dedicated task force for leadership coordination across ministries and trade bodies.</p> <p>Strong leadership in ready-made garment (RMG) sector negotiations secured GSP+ benefits from the EU.</p> <p>RMG exports grew from \$6 billion in 2000 to \$42 billion by 2022, supported by sector-focused leadership (Bangladesh Export Promotion Bureau, 2022).</p>	<p>Export leadership lacks cohesion across institutions like Ministry of Commerce, and FBR, leading to fragmented decision-making.</p> <p>Absence of a unified export vision results in weak inter-agency coordination.</p>
<b>Public Policy</b>	<p>Vietnam's proactive FDI policies, such as the Law on Investment 2020, simplify approvals and provide incentives for high-tech industries.</p> <p>Regular updates to trade policies ensure alignment with global trade trends.</p> <p>Vietnam's high-tech zones, supported by FDI-friendly policies, contributed \$50 billion to exports in 2021 (UNCTAD, 2021).</p>	<p>Export Policy 2018-21 focused on non-textile sectors like pharmaceuticals and IT, offering subsidies and training programs. Within textile sector, the focus is on Man Made Fiber textile products.</p> <p>Monitoring mechanisms ensured consistent policy implementation.</p> <p>Pharmaceutical exports grew 25% annually from 2017-2021, driven by policy incentives (World Bank, 2017).</p>	<p>Policies like the Strategic Trade Policy Framework (STPF) 2020-25 lack robust implementation and monitoring mechanisms.</p> <p>Heavy reliance on traditional agriculture based textiles with limited support for emerging sectors like IT, pharmaceuticals, and other</p>

			potential sectors like exports of Chemicals, Gems, Minerals, Seafood through blue economy, meat, agriculture products and engineering goods and within textile sector, the Man made Fiber textiles.
National Delivery	<p>Seamless delivery of trade facilitation services through the National Single Window (NSW) reduced customs clearance times by 50%.</p> <p>Integrated logistics hubs in special economic zones (SEZs) enhanced export delivery.</p> <p>Seafood exports grew significantly due to efficient customs operations and logistics hubs.</p>	<p>UN funded the Automated System for Customs Data (ASYCUDA) modernized customs processes, reducing delays for RMG exporters.</p> <p>Export processing zones (EPZs) ensured efficient production-to-export delivery.</p> <p>Dhaka EPZ reduced production-to-export timelines by 20%, boosting competitiveness in global markets (WTO Trade Policy Review, 2019). In 2021-2022, exports from EPZs reached a record high of US\$8.65 billion.</p>	<p>Customs inefficiencies persist due to the limited integration of WeBOC with other regulatory agencies.</p> <p>Delays in SEZ development under CPEC hinder export competitiveness. A key example is Siah Dik Copper Project for export of Copper.</p>
People and Processes	<p>FDI projects include local employment quotas, promoting skill development in rural areas.</p> <p>Government training programs prepare the workforce for high-tech industries.</p> <p>Over 300,000 rural jobs created in the footwear sector, with women comprising a significant share (ILO, 2021).</p>	<p>Skills for Employment Investment Program (SEIP) trained over 300,000 workers, enhancing female participation in the RMG workforce. This project focused on the segment of the population from disadvantaged backgrounds, like helpless women, persons with disabilities (PWDs), ultra-poor, ethnic minorities, transgender, etc., to be included in the training program and secure job placement for them</p> <p>Women-focused financial programs empower rural entrepreneurs.</p> <p>Women constitute 80% of the</p>	<p>Limited training programs for women and rural exporters in non-textile sectors.</p> <p>SMEs in underserved regions lack access to digital tools and infrastructure.</p>

		RMG workforce, contributing to its \$42 billion export value (Md. Ziauddin Iqbal, 2024)	
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Based on the preceding discussion and analysis of the export enhancement strategies employed by Vietnam and Bangladesh, it is evident that Pakistan must implement the following policy-level decisions to develop a robust and efficient export sector;

### ***3.1 Strategy and Leadership:***

- Align strategies across key institutions like Ministry of Commerce, SBP, and FBR to ensure cohesive decision-making and unified vision for export growth.
- Create a 10-year plan with clear goals for export diversification and FDI attraction.
- Focus on high-value sectors such as IT, electronics, and pharmaceuticals along with other potential sectors such as high-value agriculture, Chemicals, Gems, Minerals, Seafood through blue economy, meat, engineering goods and Man-made Fiber textiles.
- Introduce tax exemptions and simplified approvals for foreign investors in priority sectors through Board of investment like Vietnam's success in attracting global tech giants like Samsung and Intel.

### ***3.2 Public Policy***

- Introduce dedicated policies for exports of IT, pharmaceuticals, high-value agriculture, Chemicals, Gems, Minerals, Seafood through blue economy, meat, engineering goods and Man-made Fiber textiles.
- Include subsidies, tax incentives, and capacity-building initiatives for non-textile sectors.
- Establish independent units to monitor export policies like STPF, ensuring timely adjustments like Bangladesh's practice of involving regional trade bodies in policy implementation.
- Facilitate compliance with certifications like Global G.A.P (Global G. A.P. is an internationally recognized certified standard that ensures Good Agricultural Practices) and labor standards to boost agriculture and dairy based exports.

### ***3.3 National Delivery***

- Full automation of customs and trade services under a Pakistan single window platform like Vietnam's National Single Window (NSW) system for seamless inter-agency coordination.
- Streamline approvals for SEZ projects and prioritize infrastructure development.
- Develop sector-specific SEZs focusing on electronics, RMG, and pharmaceuticals by incentivizing investment in public private mode.

- Modernize logistics hubs and reduce port delays, learning from Bangladesh's EPZ success which US\$8.65 billion exports from EPZs.

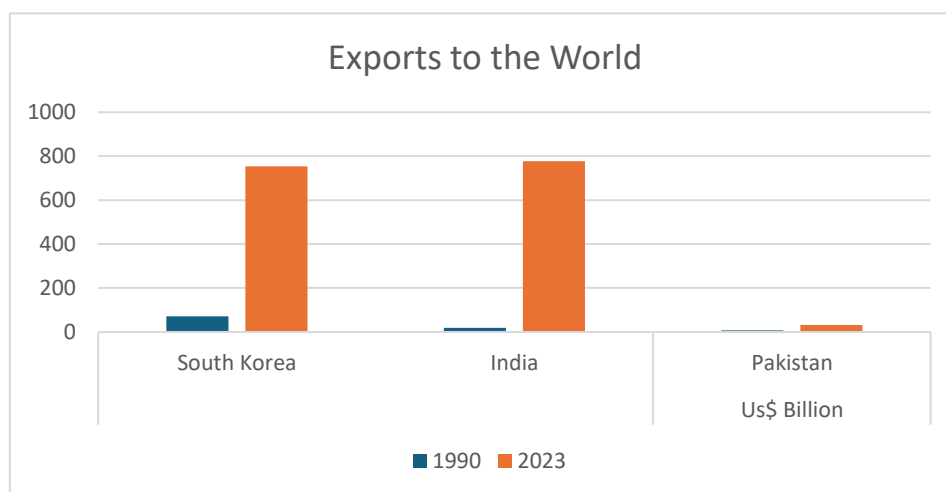
### 3.4 People and Processes:

- Introduce programs like Bangladesh's Skills for Employment Investment Program (SEIP).
- Expand digital literacy, e-commerce, and platform-specific training for freelancing.
- Provide targeted financial assistance and market access to rural businesses in underserved areas like Gilgit-Baltistan and Baluchistan.
- Invest in digital infrastructure to enable participation in IT and online marketing agriculture exports.
- Launch specialized training for high-tech industries, similar to Vietnam's initiatives for electronics manufacturing.
- Collaborate with the private sector to address skill gaps in pharmaceuticals and IT.

## 4. Comparative Analysis of Pakistan's Export Sector with India and South Korea:

Pakistan, India, and South Korea, despite their unique cultural and regional characteristics, share similarities in their historical and geopolitical contexts. Each of these nations emerged from the significant divisions of the mid-20th century: Pakistan and India from the partition of British India, and Korea from the period of Japanese occupation. They all shared a legacy of colonial governance and encountered similar obstacles during the post-colonial phase. In the 1990s, all three countries faced challenges in their export sectors; however, India and South Korea have since made substantial advancements in their export capabilities, significantly outpacing Pakistan. A detailed comparison of the export figures for these three nations is presented below.

Table-XII



A comparative analysis given below analyze the factors driving these differences to identify areas for improvement and implement strategies to enhance Pakistan export competitiveness in the global market.

Practices	India	South Korea	Area for reform for Pakistan
<b>Political Commitment and Government Support</b>	<p>Focused on export promotion through flagship initiatives like "Make in India," aimed at boosting domestic manufacturing and exports.</p> <p>Despite the change of Governments, the policies remain intact.</p>	<p>Long-term industrial strategies like the "5-Year Economic Development Plans" ensure policy continuity and support for exports which help in transition from an agrarian economy to a global industrial powerhouse, with exports of semiconductors, electronics, and automobiles.</p>	<p>There is a need for "Charter of Economy" among all the political parties for consistencies in the economic development policies.</p> <p>Strengthen political commitment by aligning national export policies with a long-term vision. Empower the institutions for consistency of the policies without political interference.</p>
<b>Export Structure</b>	<p>Highly diversified export basket, including IT services (23%), pharmaceuticals (10%), and engineering goods (15%).</p> <p>IT industry led by giants like TCS, Infosys, and Wipro contributes over US\$300 billion annually.</p> <p>Policy support through the Foreign Trade Policy 2021-2026, incentivizing emerging sectors.</p>	<p>A global leader in high-tech exports, specializing in electronics (semiconductors, smartphones), automobiles, and machinery.</p> <p>Known for strong emphasis on research &amp; development and technological innovation</p> <p>Exports of semiconductors alone contributed to over US\$128 billion in 2022</p>	<p>Primarily relies on low-value-added exports, heavily concentrated in agriculture based textiles and few agriculture products (rice, cotton), and some light manufacturing. Limited diversification restricts growth potential.</p> <p>There is a need for export basket diversification by including exports of Chemicals, Gems, Minerals, Seafood through blue economy, meat, agriculture products and engineering goods. Within textile sector, the focus must be given to Man made Fiber textiles.</p>



<b>Export Destinations</b>	Diversified export markets across regions, including Asia, Europe, and the Americas. This reduces reliance on any single market and provides greater stability.	Strong presence in global markets, with significant exports to major economies like the US, China, and the EU.1 Extensive regional trade agreements further expand market access.	Relatively concentrated on a few major markets, primarily the US and Europe. Diversification is required to decrease vulnerability to economic downturns in key markets.
<b>Financial and Policy Support</b>	<p>Production Linked Incentive (PLI) Incentivizes manufacturing in key sectors like electronics and pharmaceuticals.</p> <p>Market Access Initiative (MAI) to Financially assist for trade fairs and market research.</p> <p>Trade Infrastructure for Export Scheme (TIES) funds logistics and export-related infrastructure.</p>	<p>Subsidized R&amp;D in export-oriented industries like electronics and chemicals.</p> <p>Tax breaks for exporters and government-backed credit guarantees.</p> <p>Korea Trade Insurance Corporation (K-Sure) offers comprehensive export financing and credit insurance.</p>	<p>Enhancement of financial incentives and improvement in refund mechanisms for exporters.</p> <p>Foster implementation framework for Policies like EFS and LTFF to eliminate delays in implementation.</p>
<b>Infrastructure Development</b>	<p>Logistics and Digital Platforms:</p> <p>National Logistics Policy (2022) aims to reduce logistics costs from 13% to 8% of GDP.</p> <p>Digital platforms like ICEGATE streamline customs and trade documentation.</p>	<p>Smart Ports and Advanced Logistics:</p> <p>Incheon Port leads in trade efficiency through digitized systems and integrated logistics hubs.</p>	Reduction in logistics costs and improvement of port infrastructure and fragmented customs processes to mitigate delays.
<b>Human Capital and Skill Development</b>	Focus on skill development through programs like the Skill India Mission to upskill the workforce for export-oriented	<p>Investments in education and R&amp;D to prepare a workforce for high-tech industries.</p> <p>Industry-specific training programs in</p>	<p>Development of training programs for IT, high-tech manufacturing, and export-oriented agriculture.</p> <p>Alignment between</p>

	industries. IT and engineering graduates form the backbone of the services export sector.  Over 1.5 million IT professionals are employed globally, contributing to export growth.	collaboration with universities.  High-tech sectors like semiconductors and electronics benefit from a skilled workforce.	education and industry needs.
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### 5. GAP Analysis for Improvement in Pakistan's Export Sector:

Based on above discussion and analysis, a GAP analysis has been made. The following GAP analysis highlights areas for improvement by identifying gaps in general and in comparison, to successful practices in Vietnam, Bangladesh, India, and South Korea, and outlines actionable reforms to address these challenges;

#### 1. Strategy and Leadership:

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>Cohesive Leadership</b>	Lack of coordination among MoC, FBR, and TDAP reduces policy coherence.	Establish a <b>national level leadership Council</b> for cohesive decision-making and export strategy, inspired by <b>Vietnam's centralized export strategy under SEDS 2021-2030</b> , which integrates FDI, trade facilitation, and infrastructure investments.
<b>Sectoral Focus</b>	Over-reliance on textiles with minimal diversification.	Develop a <b>10-Year Export Diversification Plan</b> focusing on IT, pharmaceuticals, and engineering goods, learning from <b>Bangladesh's sector-focused leadership in RMG</b> , which grew exports from \$6B in 2000 to \$42B in 2022.
<b>Long-Term Vision</b>	Absence of a long-term export-led growth strategy.	Establish a <b>National Export Vision</b> with clear FDI targets and sectoral goals, inspired by <b>India's Make in India initiative</b> , which combines domestic manufacturing and export promotion under a cohesive long-term strategy.

## 2. Governance and Public Administration:

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>Weak Policy Implementation</b>	Frequent changes in trade policies undermine continuity and effectiveness.	Establish <b>robust monitoring and evaluation frameworks</b> for all export-related policies. <b>Vietnam's Socio-Economic Development Strategy (SEDS)</b> ensures policy consistency and long-term monitoring mechanisms, leading to sustained export growth.
<b>Limited Inter-Agency Coordination</b>	Export-related bodies like MoC, FBR, and TDAP operate in silos, reducing efficiency.	<b>Foster inter-agency collaboration</b> through joint working groups and digital coordination platforms. <b>Vietnam's National Single Window (NSW)</b> successfully integrated multiple agencies, reducing customs clearance times and improving export facilitation.
<b>Accountability and Monitoring Deficiencies</b>	Inadequate mechanisms to track policy outcomes and address inefficiencies.	Implement a <b>Charter of Economy</b> to ensure political consensus and continuity in export-related policies. <b>South Korea and India Economic Development Plans</b> maintain continuity and accountability through a unified national vision for economic and export development.

## 3. Export Diversification:

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>Export Concentration</b>	Heavy reliance on low-value textiles (60% of total exports).	Expand the export base by focusing on <b>electronics, Chemicals, Pharmaceuticals, Chemicals, Gems, Minerals, Seafood through blue economy, meat, agriculture products, light engineering goods</b> and within textile sector, the focus must be given to <b>Man made Fiber textiles taking cues from Vietnam</b> , where electronics exports grew by 250% in a decade and now contribute 40% of total exports.
<b>Market Access</b>	Limited access for agriculture, IT, and minerals to global markets.	Improve compliance with global standards like <b>Global G.A.P</b> for agriculture and <b>ISO certifications for IT</b> , following Bangladesh's targeted initiatives that enhanced GSP+ utilization for the RMG sector and improved global market access.
<b>Global Value Chains</b>	Weak integration into global value chains (GVCs).	<b>Enhance R&amp;D funding</b> and establish Sector-Specific SEZs for pharmaceuticals and electronics, mirroring <b>South Korea's deep GVC</b> integration through R&D investments in semiconductors, electronics, and automobiles.

**4. Human Capital & Skill Development:**

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>IT &amp; High-Tech Skills</b>	Limited focus on IT and advanced manufacturing skills for export industries.	Enhance <b>Digital Literacy</b> and High-Tech Training Programs to upskill the workforce for IT and high-value manufacturing, inspired by <b>India's Skill India Mission</b> , which contributed to \$200B IT exports annually.
<b>Marginalized Groups</b>	Women and rural exporters face significant barriers in accessing export markets.	Expand initiatives like SMEDA's Digital Literacy Program to train rural women and SMEs, focusing on untapped regions like Balochistan and Gilgit-Baltistan, taking insights from <b>Bangladesh's SEIP</b> , which trained over 300,000 disadvantaged workers.

**5. Financial and Policy Support:**

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>Export Financing</b>	Inefficient implementation of schemes like EFS and LTFF.	<b>Streamline EFS/LTFF disbursement</b> processes and include targeted subsidies for emerging sectors like IT and agriculture, inspired by <b>India's Production Linked Incentive (PLI)</b> program, which incentivizes manufacturing exports.
<b>Tax Reimbursement</b>	Absence of a reimbursement mechanism for indirect taxes.	<b>Improve tax refund mechanism</b> like <b>India's RoDTEP</b> , which reimburses embedded taxes and duties for exporters, effectively reducing export costs and boosting competitiveness.
<b>SME Credit Access</b>	SMEs face barriers in accessing export finance due to collateral requirements.	<b>Provide collateral-free loans</b> and simplify documentation requirements for SME exporters, following <b>Bangladesh's approach</b> to easy credit access for RMG SMEs, which facilitated exponential growth.

**6. Trade Facilitation & Infrastructure:**

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>Customs Processes</b>	Inefficiencies in customs and limited digitization increase export costs.	Fully <b>integrate Pakistan Single Window (PSW)</b> for seamless inter-agency coordination, learning from Vietnam's National Single Window (NSW), which reduced customs clearance times by 50%.
<b>Logistics Costs</b>	High logistics costs and inadequate port infrastructure reduce competitiveness.	<b>Modernize ports, establish regional logistics hubs</b> , and incentivize private sector investments in logistics, inspired by <b>India's National Logistics Policy</b> , which aims to cut logistics costs from 13% to 8% of GDP.
<b>SEZ Development</b>	Delays in developing SEZs hinder competitiveness.	Accelerate <b>SEZ development</b> with a focus on high-value industries like electronics, pharmaceuticals, and processed foods, following <b>Bangladesh's success in EPZs</b> , which accounted for \$8.65B in exports in 2021-22.

**7. Trade Facilitation & Infrastructure:**

Aspect	Gaps in case of Pakistan	Recommendations with Insights from Comparative Practices
<b>FTA Utilization</b>	Limited utilization of FTAs due to lack of readiness and market access.	<b>Conduct sectoral readiness assessments and improve FTA negotiations</b> to address <b>non-tariff barriers</b> , modeled after <b>South Korea's extensive FTA network</b> with key markets like the US, EU, and ASEAN.
<b>Market Concentration</b>	Dependence on a few key markets like the US and EU.	Expand market access through bilateral agreements and <b>trade missions, targeting Africa, Central Asia, and South America</b> , following <b>India's strategy</b> of diversifying exports across Asia, Africa, and the Americas.

**6. The "Missing Export" and Untapped Export Markets in Case of Pakistan:**

Pakistan possesses significant untapped export potential across diverse sectors. The sector like Chemicals, Pharmaceuticals, Chemicals, IT, Gems, Minerals, Seafood, meat, agriculture products, light engineering goods and Man-Made Fibers Textiles offers a prime avenue for growth. These sectors have the potential to become major export earners, catering to both domestic and international markets.

The diversification of exports is crucial for Pakistan to improve its competitiveness in the international market and attain sustainable economic development. The World Bank has evaluated Pakistan's annual export potential to be \$88.1 billion citing the "**missing exports**" of US\$ 61 billion (Mulabdic, J. Varela, 2023), indicating considerable opportunities for growth and the necessity to broaden the range of export products. Nations such as

Vietnam and Bangladesh have effectively implemented export-driven growth strategies, leading to swift industrialization and significant market shares globally, especially in the textile industry.

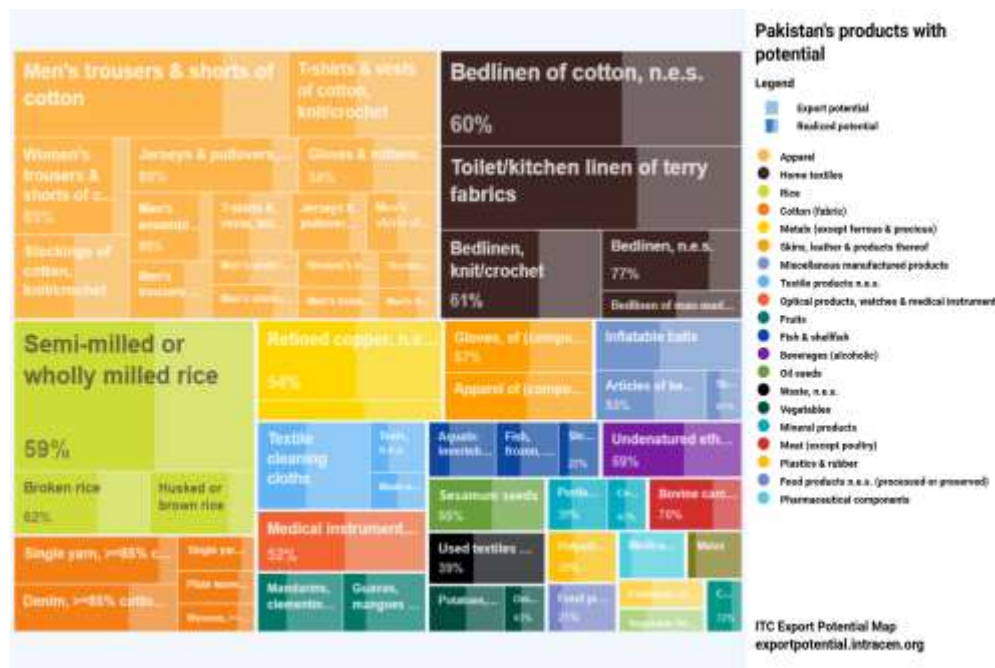
The world bank study has highlighted the following sectors with the potential missing exports;

**Table-XIV**

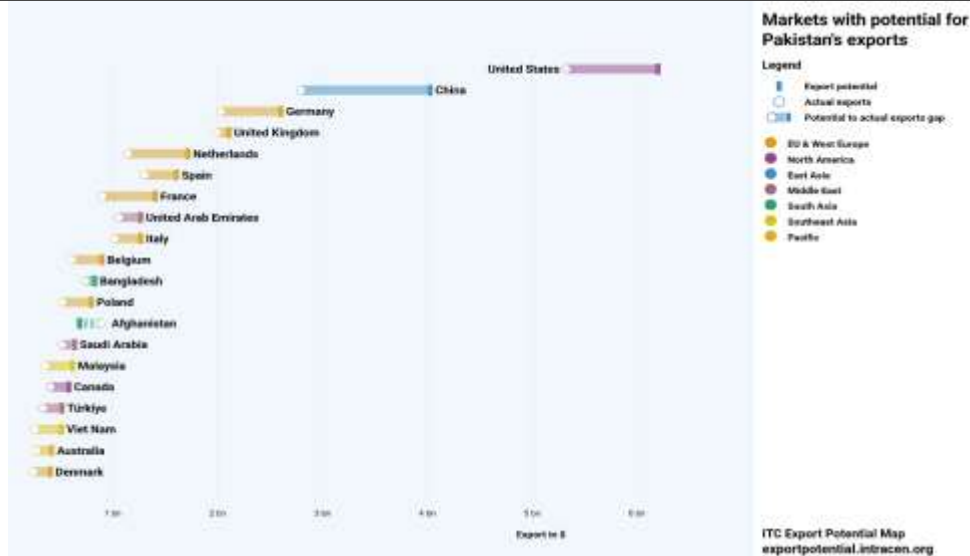
Sector	Export Potential	Current Situation
Machinery & Equipment	High	Under-exported due to lack of support
Minerals & Metals	High	Mostly exported in raw form, with low value addition.
Chemicals & Pharmaceuticals	Moderate	Minimal focus on exporting finished products.
Non-Textile Manufacturing	High	Government focus remains on textiles, limiting diversification.

*Source: World Bank*

The ITC Export Potential Map, developed by the International Trade Centre (ITC), evaluates a nation's export capabilities and identifies key sectors for potential exports. The said map identifies the following sectors for the potential exports from the Pakistan in global trade;



The ITC Export Potential Map further highlights the untapped export potential of Pakistan in relation to its top 20 trading partners as follows.



In addition to the above, specific product wise export potential of Pakistan is discussed below;

**Meat:** China consumes 23% of the world's total beef production while Pakistan exports only 0.5% of the world's consumption.

**Man Made Fiber Textiles:** The global textiles and apparel trade is witnessing a significant transformation, shifting emphatically towards man-made fibers (MMF), which now constitute approximately 63% of global textiles and apparel trade, earning them the title "fiber of the future". However, the share of Pakistan in global Man-Made Fiber Textile is only 1%.

**Copper:** The global trade volume of Copper ores and concentrates for the year 2021 was 88 billion US dollars, with an annual growth rate of 9% and a quantity of 37 million metric tons of copper ores and concentrates exported at a cost of 2,369 US dollars per ton. However, Pakistan is exporting the Copper ores and concentrates to only one partner i.e. China at the lowest cost at 453 US \$/ton. It can be a source of addition to the export volume if Pakistan manage the pricing of the product and also explore new markets such as Japan, Korea, Germany, Canada, Spain, USA, and India, etc.

### *Conclusion:*

Pakistan energy sector is trapped in vicious cycle where Electricity Tariff is too much high for domestic and industrial consumers which has hampered the Industrial development and forcing Industrial and Domestic consumers to switch to alternate energy options by leaving National Grid as observed through Solarization Boom. This is further reducing the electricity consumption of National Grid thus further increasing electricity tariffs for remaining consumers of National Grid due to fixed capacity payments charges under IPPs agreements.

Lack of focus and investment in Renewable Energy Infrastructure has made Thermal Production the dominant contributor in Energy Mix. Oil and Gas exploration activities are minimal despite the fact that Pakistan's power production heavily dependent upon imported oil. The Findings of research calls for policy action in the form of practical recommendations through Tailored energy policies for ensuring that the Energy Sector may play its role in Industrial development of Pakistan. The export sector in Pakistan is a crucial element of the country's economic structure, supporting growth, industrial advancement, and the generation of foreign exchange. However, despite its significant potential, the sector continues to face various structural and operational obstacles, such as excessive dependence on textiles, insufficient diversification, and fragile institutional frameworks. Tackling these challenges is essential for attaining sustainable economic growth and minimizing reliance on external borrowing.

The regulatory and policy environment governing Pakistan's exports, though extensive, is troubled with inefficiencies. Initiatives like the Strategic Trade Policy Framework (STPF) and Export Facilitation Scheme (EFS), Export Finance Scheme etc. have been undermined by inconsistent implementation and bureaucratic delays. Reforming these frameworks to ensure coherence, transparency, and integration with industrial policies will enhance competitiveness. Furthermore, strengthening inter-agency coordination among key institutions like the Ministry of Commerce, Federal Board of Revenue, Finance Division and State Bank of Pakistan is essential for effective governance and development of an export led growth mechanism.

Pakistan's export performance has demonstrated resilience in textiles, which account for approximately 60% of total exports. However, the limited development of other sectors, such as Chemicals, Pharmaceuticals, Chemicals, IT, Gems, Minerals, Seafood, meat, agriculture products, light engineering goods and Man-Made Fibers Textiles, underlines the urgent need for diversification. Comparative analyses with nations like Vietnam, Bangladesh, India, and South Korea reveal the transformative impact of targeted strategies, sector-specific incentives, and robust governance. These countries have leveraged their policies to foster innovation, attract foreign investment, and integrate into global value chains, presenting valuable lessons for Pakistan.

Pakistan's comparative disadvantage in global trade highlights deficiencies in infrastructure, human capital, and market readiness. Lessons from Vietnam's high-tech zones, Bangladesh's ready-made garments sector, South Korea's research and development investments and India's "Make in India" initiative provide actionable insights, particularly in terms of aligning national policies with long-term visions for export-led growth. Similarly, diversifying export markets to include Africa, Central Asia, and South America can mitigate the risks of market concentration.



Unlocking the potential of potential sectors, such as Chemicals, Pharmaceuticals, Chemicals, IT, Gems, Minerals, Seafood, Meat, agriculture products, light engineering goods and Man-Made Fibers Textiles, is crucial for enhancing Pakistan's global competitiveness. Initiatives to modernize logistics, digitize customs operations, and establish sector-specific Special Economic Zones (SEZs) will further reduce trade costs and improve delivery systems. Additionally, targeted support for SMEs and rural exporters, particularly women-led enterprises, can make the export sector more inclusive and equitable.

In conclusion, a comprehensive strategy is required to revitalize Pakistan's export sector. By addressing policy gaps, enhancing institutional capacity, and aligning with regional as well as global best practices, Pakistan can transform its export sector into a dynamic driver of economic growth. The actionable recommendations identified through this study serve as a pragmatic roadmap for achieving competitiveness, sustainability, and diversification in the export landscape.

### **RECOMMENDATIONS**

To address the challenges and capitalize on the opportunities identified in the above paragraphs, the following actionable recommendations are proposed for transforming Pakistan's export sector into a sustainable and diversified growth instrument.

#### **1. Strengthen Policy Framework and Implementation:**

##### **1.1 Consistency in Trade Policies:**

Establish a long-term National Export Vision with bipartisan support to ensure policy continuity and reduce the impact of political transitions.

##### **1.2 Effective Monitoring Mechanisms:**

Develop a centralized monitoring and evaluation framework for export-related policies like the Strategic Trade Policy Framework (STPF), inspired by Vietnam's success in tracking policy implementation.

##### **1.3 Simplify Regulations:**

Reduce bureaucratic bottlenecks by streamlining export-related processes under a unified digital platform by interlinking all regulatory bodies such as Pakistan Single Window (PSW).

#### **2. Export Diversification and Market Expansion:**

##### **2.1 Expand Sectoral Focus:**

Prioritize underdeveloped high-potential sectors like IT, pharmaceuticals, chemicals, engineering goods, and man-made fiber textiles through targeted tax incentives, subsidies, and R&D funding. Address the gap in "missing exports" by encouraging value addition in underutilized sectors such as minerals (e.g., copper), agriculture products, and seafood.

Incentivize private sector participation in manufacturing of value-added products and increased export value.

## **2.2 Market Access:**

Establish new trade agreements and strengthen compliance with international certifications like Global G.A.P for agriculture exports, ISO standards for IT, and advanced technical benchmarks for manufacturing goods. Focus on aligning export products with demand trends in untapped high-value markets. Additionally, address non-tariff barriers that hinder access to lucrative global markets.

## **2.3 Untapped Markets:**

Target underexplored regions such as Africa, Central Asia, and South America to reduce over-reliance on traditional markets like the US and EU. Expand exports of products like processed meats, high-quality agricultural goods, man-made fibers, and engineering goods to match global demands. Highlight the importance of diversifying both products and markets. Focus on products like copper, where exports are currently undervalued and limited to a single market, and explore opportunities in regions like Japan, South Korea, Germany, and Canada to bridge this gap.

## **3. Boost Institutional Capacity**

### **3.1 Inter-Agency Coordination:**

Foster collaboration among the Ministry of Commerce, Federal Board of Revenue (FBR), and Trade Development Authority of Pakistan (TDAP) through joint task forces and digital coordination platforms. 3.2 Enhanced Role of TDAP: Allocate more resources to TDAP for organizing global trade fairs, conducting market research, and supporting SMEs in non-traditional sectors. 3.3 Modernize Customs Operations: Fully automate customs processes using blockchain technology to enhance transparency and efficiency, reducing clearance times.

## **4. Infrastructure Development**

### **4.1 Special Economic Zones (SEZs):**

Accelerate the development of sector-specific SEZs for high-tech industries like electronics and pharmaceuticals, modeled on Bangladesh's successful EPZ framework.

### **4.2 Logistics and Ports Modernization:**

Improve logistics infrastructure and reduce port delays by incentivizing private sector investment, inspired by India's National Logistics Policy.

## **5. Human Capital and Skill Development**

### **5.1 Skill Development Programs:**

Launch specialized training initiatives for high-potential sectors, including IT, high-tech manufacturing, and export-oriented agriculture, similar to India's Skill India Mission.

### **5.2 Inclusivity in Exports:**

Expand programs like SMEDA's Digital Literacy Training to include rural women, small businesses, and marginalized groups in regions like Baluchistan and Gilgit-Baltistan.

### **5.3 Collaboration with the Private Sector:**

Partner with industry leaders to design training programs that align with global export standards.

## **6. Financial and Policy Support for SMEs:**

### **6.1 Expand SME Credit Access:**

Simplify collateral requirements and provide subsidized credit to SMEs for entering export markets, following Bangladesh's approach in the RMG sector.

### **6.2 Improve Tax Refund Mechanisms:**

Introduce transparent, automated tax refund systems like India's RoDTEP to reduce delays and improve liquidity for exporters.

### **6.3 Export Financing:**

Enhance access to financial schemes like the Export Finance Scheme (EFS) and Long-Term Financing Facility (LTFF) by reducing administrative hurdles.

## **7. Innovation and R&D**

### **7.1 Invest in Technology:**

Facilitate widespread adoption of modern technologies across manufacturing, agriculture, and IT sectors by offering R&D grants, low-interest loans, and tax incentives for innovation. Establish innovation hubs and incubators to support startups in high-potential areas such as renewable energy, artificial intelligence, and biotechnology. Encourage public-private partnerships to fund and commercialize innovative solutions, leveraging lessons from South Korea's focus on high-tech industries like semiconductors and electronics.

## 7.2 Support High-Value Exports:

Facilitate partnerships between local businesses and global firms to leverage advanced technologies and attract expertise for value addition in minerals, agriculture, and light engineering goods to increase export revenues.

### *Practical Implementation Plan (PIP) for Pakistan's Export Sector:*

Based on the recommendations above, a practical implementation plan (PIP) has been developed utilizing the Log Frame Matrix, which outlines specific actions, stakeholders, timeframes, and Key Performance Indicators aimed at enhancing the export sector of Pakistan:

**Table-XV**

Objective	Action	Stakeholders	Timeframe	Key Performance Indicators (KPIs)
<b>Policy Strengthening</b>	Develop a <b>National Export Policy</b> with bipartisan support.	Cabinet, Ministry of Commerce (MoC), Planning Commission, Finance Division, FBR	1 year	Adoption of the export-led growth policy.
	Introduce a <b>centralized monitoring mechanism (CMU)</b> for export policies like STPF, integrating provincial oversight for localized implementation and accountability. Establish a <b>Federal-Provincial Coordination Board</b> for Export Monitoring.	Cabinet, Ministry of Commerce (MoC), Planning Commission, FBR, TDAP, Provincial Planning & Development Departments	1 year	Quarterly performance reports from each province submitted to the CMU.  inclusion of provincial KPIs in national export targets.
	Digitize regulatory processes under the <b>Pakistan Single Window (PSW)</b> initiative.	FBR, MOC, Ministry of IT.	06-12 months	80% reduction in manual processes for export compliance.
<b>Export Diversification</b>	Offer tax incentives and subsidies for <b>non-traditional sectors</b> (Chemicals,	MOC, Ministry of Finance, FBR,	1-2 years	20% growth in exports of non-traditional sectors.

	Pharmaceuticals, Chemicals, IT, Gems, Minerals, Seafood, meat, agriculture products, light engineering goods and Man-Made Fibers Textiles).	SBP		
	Encourage value addition in <b>minerals, agriculture, and light engineering goods.</b>	Ministry of Industries, private sector, NARC, Provincial Agriculture Department.	2–4 years	25% increase in processed exports.
	Negotiate <b>new trade agreements</b> with African, Central Asian, and South American nations and <b>Re-negotiate</b> existing trade agreements where trade balance is negative.	MOC, Ministry of Foreign Affairs.	3–5 years	Signing of at least 5 new trade agreements with in European as well as U.S market.
<b>Institutional Capacity Building</b>	Establish a <b>coordination mechanisim</b> among MoC, Finance Division, and FBR for cohesive policy implementation.	MOC, Finance Division, FBR	6 months	Regular inter-agency meetings and joint project execution.
	Increase budget allocations for <b>TDAP</b> to support global trade fairs and SMEs.	MOC, Ministry of Finance	1 year	50% increase in SMEs' participation in trade fairs.
	Fully automate <b>customs processes</b> using blockchain and digital platforms.	FBR, Ministry of IT	2 years	Reduction of Customs clearance times by 50%.

<b>Infrastructure Development</b>	Accelerate development of <b>Special Economic Zones (SEZs)</b> for high-tech, Chemical and pharmaceutical sectors.	MOC, SEZ authorities, private investors	3–5 years	Operationalization of at least 3 sector-specific SEZs.
	Modernize logistics infrastructure, including ports and cold storage facilities.	NHA, Ministry of Maritime Affairs, KPT, Port Qasim Authority, Gwadar Port Authority, private sector	2–4 years	30% reduction in logistical costs for exporters.
<b>Human Capital Development</b>	Launch <b>sector-specific training programs</b> for IT, high-tech manufacturing, and agriculture.	SMEDA, PSEB, provincial governments	1–3 years	100,000 trained professionals across export-oriented fields.
	Expand <b>digital literacy programs</b> to rural women and SMEs in underserved regions.	SMEDA, IT Ministry, NGOs	2 years	30% increase in participation of women in exports.
<b>Financial and Policy Support</b>	Simplify <b>credit access</b> for SMEs by reducing collateral requirements.	SBP, MOC, commercial banks	1–2 years	20% increase in SME export contributions.
	Automate and fast-track <b>tax refund mechanisms</b> for exporters.	FBR, Ministry of Finance	1 year	80% of pending refund claims are processed within 3 months.
	Expand <b>Export Finance Scheme (EFS)</b> and LTFF to include emerging and potential sectors.	SBP, MoC	1–2 years	25% increase in financing to IT and pharmaceutical sectors.

<b>Innovation and R&amp;D</b>	Establish <b>innovation hubs</b> for research in renewable energy, IT, and high-tech manufacturing.	Ministry of Science, private sector	3 years	Launch of 5 innovation hubs in priority sectors.
	Fund <b>value-added research</b> in minerals and agro-processing industries.	MOC, universities, private sector	3 years	20% growth in export-ready processed products.
<b>Targeting Missing Exports</b>	Identify products with high <b>missing export potential</b> (e.g., Machinery & Equipment Minerals & Metals Chemicals & Pharmaceuticals Non-Textile Manufacturing).	MOC, TDAP.	1 year	Roadmap for bridging the missing export revenue gap.
	Facilitate market entry for undervalued exports (e.g., copper, meat etc).	MOC, TDAP	2 years	Entry into 5 new high-potential markets.

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# Critical Evaluation of Energy, Pol, GAS/LNG, Policies, Strategies and Practices in Relation with the Industrial Development in Pakistan

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## Abstract:

This research analyzes the challenges and opportunities within Pakistan's energy sector, particularly its role in supporting industrial development. The sector is hindered by inefficiency, fragmented policies, and limited renewable energy investment. The paper evaluates Pakistan's energy capacity, governance, and institutional frameworks, utilizing SWOT analysis and global case studies to identify key reform areas. Key findings reveal that rising energy costs and reliance on fossil fuels impede industrial growth, while inadequate renewable infrastructure exacerbates these issues. The study offers policy recommendations such as creating an independent electricity market, renegotiating power agreements, and promoting energy efficiency. Furthermore, the paper highlights the need to operationalize Special Economic Zones (SEZs), upgrade transmission lines, and adopt sustainable energy practices. These reforms aim to lower costs, improve sector efficiency, and ensure long-term industrial growth.

## Key words:

Energy Sector, Industrial Development, Policy Reform, Renewable Energy, Efficiency.

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## *Introduction*

An efficient energy sector, which mainly encompasses electric energy, petroleum (POL), Natural Gas/LNG, RLNG, Coal, Wind, Solar etc. plays a pivotal role in national development, directly influencing industrial growth, economic development, and socio-economic development. The symbiotic relationship between cost-efficient and uninterrupted supply of energy and industrial development is inevitable. In Pakistan, the complex interplay of policies, strategies, and practices within this sector, and policies indirectly influencing it have significant implications for the industrial development of Pakistan. The energy sector faces persistent challenges, including institutional inefficiencies, fragmentation of legislative frameworks, capacity constraints, and policy gaps, hindering its ability to support sustainable industrial growth. Rising costs and tumbling supplies of fossil fuels have a greater push for sustainable and renewable energy sources to reshape industrial practices, promote energy efficiency, and reduce environmental impact.

This research paper critically evaluates Pakistan's energy sector, with a prime focus on country's industrial development goals. It examines the sector's capacity, preparedness, outputs, and processes, along with the legal and institutional frameworks that govern it. The study also identifies key strengths, weaknesses, opportunities, and threats by conducting SWOT, EETH and BETH analysis to uncover growth potential and enhance sectoral efficiency.

Furthermore, the paper employs the Blavatnik School of Government's Oxford Index of Public Administration (OIPA) to evaluate the governance, public administration, and service delivery mechanisms within Pakistan's energy sector. A GAP analysis has been conducted with India and Bangladesh to highlight deficiencies and identify actionable lessons from policy actions implemented in these countries to address similar challenges. In addition, the role of Pakistan's energy sector in driving industrial development is explored through a comparative analysis of global best practices. This evaluation identifies effective strategies adopted by other nations to leverage their energy sectors for industrial growth and assesses their relevance and applicability to Pakistan. The findings underscore critical areas where reforms are necessary to enhance sectoral performance and foster industrial expansion.

The research concludes with pragmatic recommendations to address the issues and challenges identified in the analysis. These recommendations are structured within a log frame matrix, outlining specific actions, timelines, and measurable outcomes to ensure effective implementation and long-term sustainability. By bridging gaps and incorporating global best practices, this paper aims to contribute to the transformation of Pakistan's energy sector into a robust driver of industrial and economic growth.

### ***Problem Statement***

It is undeniable that the Government is putting its efforts to manage the problems of Energy sector for revival of Industrial development. However, there are apprehensions regarding the efficacy of Government policies for addressing the Energy Sector's issues for industrial growth. Therefore, a thorough evaluation is essential to identify any shortcomings in the current Government policies, with the aim of proposing practical recommendations to maximize their effectiveness.

### ***Scope of the Study***

The study mainly focuses on overall situation of the energy situation prevailing in the country, the governance and institutional frameworks administering the energy sector, correlation of energy and industrialization and overall economic impacts prompted by the energy cost and availability. The reliance is mainly on analyzing data for the last five (5) years to establish the argument that energy deficiencies and ineffective energy governance may hinder the ability of the government for economic revival and public service delivery. The study also takes into account the future prospects and challenges of the sector to frame a workable set of recommendations.

### ***Research Methodology***

The study adopted a hybrid research design, combining qualitative and quantitative methodologies to ensure a comprehensive analysis. While qualitative methods form the core of the study, quantitative data is utilized to enhance and support the findings. The research draws on a wide array of sources, including academic studies, scholarly articles, departmental reports, and news items, to provide a well-rounded perspective. Additionally, comparative case studies of successful reforms have been taken into account. Policy Gap Analysis, Institutional Gap Analysis, Legal framework analysis, Swot-EETH Analysis, particularly focusing [Blavatnik] Oxford Index of Public Administration (OIPA) have been conducted to ascertain the discrepancies of policy and institutional frameworks of the government and fragmentation of the key institutions responsible for energy governance and management. The legislative gaps analysis was also conducted to identify lacunas in the existing legislative framework. For the practical insight of the issues, Interviews have also been conducted.

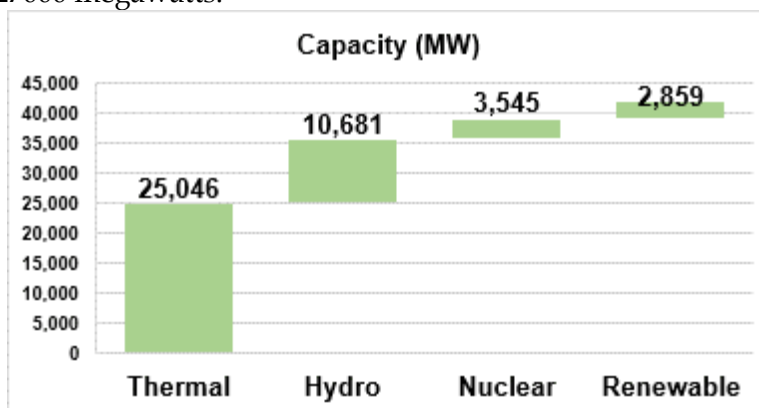
### ***SITUATIONAL ANALYSIS***

#### ***INSTALLED CAPACITY - PREVAILING SITUATION OF ELECTRICITY***

Currently 42,131 MW is the total installed capacity with percentage shares of Hydel, Nuclear, Renewable, and Thermal at 25.4 percent, 8.4 percent, 6.8 percent, and 59.4 percent, respectively (ESP, 2025).

S. NO.	TYPE	SOURCE	INSTALLED CAPACITY (MW)	PRODUCTION MW	TRANSMISSION CAPACITY MW
1.	Electricity	Thermal Power Plants (gas, coal, and oil)	25,046	14,517	22,000
2.		Hydro	10,681		
3.		Nuclear (KANUP, CHASHNUP)	3,545		
4.		Renewable Energy (Wind, Solar, Biogas)	2,859		
Total			42,131		

Installed capacity of the electricity is far above the actual need, or in other words, from actual consumption of the country which in peak periods stood around 27000 megawatts.



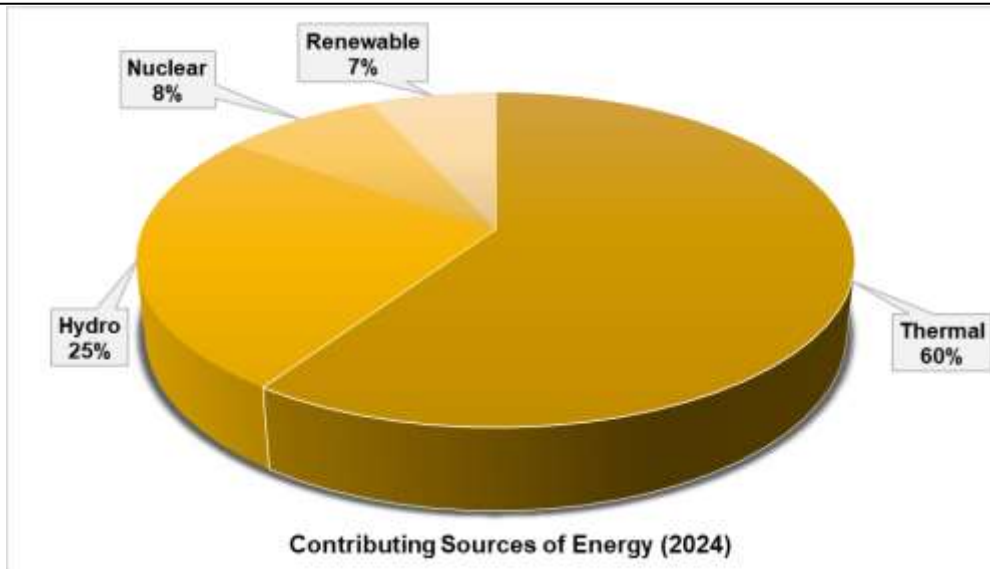
### THE ENERGY MIX

Most of the energy Pakistan presently producing comes from thermal resources. During the year 2023-24, Pakistan spent huge amounts of foreign reserves on import of petroleum products, LNG and coal to meet its energy needs.

S. NO.	TYPE	PRODUCTION/IMPORT	CONSUMPTION	IMPORT BILL
1.	Petroleum	Local: 2.75 MN Ton Imported: 11.0 MN tons	12.3 MN Ton	\$15.16 billion
2.	Gas	3,116 MMCFD/Day	3,207 MN cubic feet per day	Local Production
3.	LNG	Local: 0 Imported: 7.15 MN tons		\$4.05 billion
4.	Coal	Imported: 23.9 MN tons Local: 17.06 MN Tons		\$2.7 billion

Source (ESP, 2025); Self-prepared.

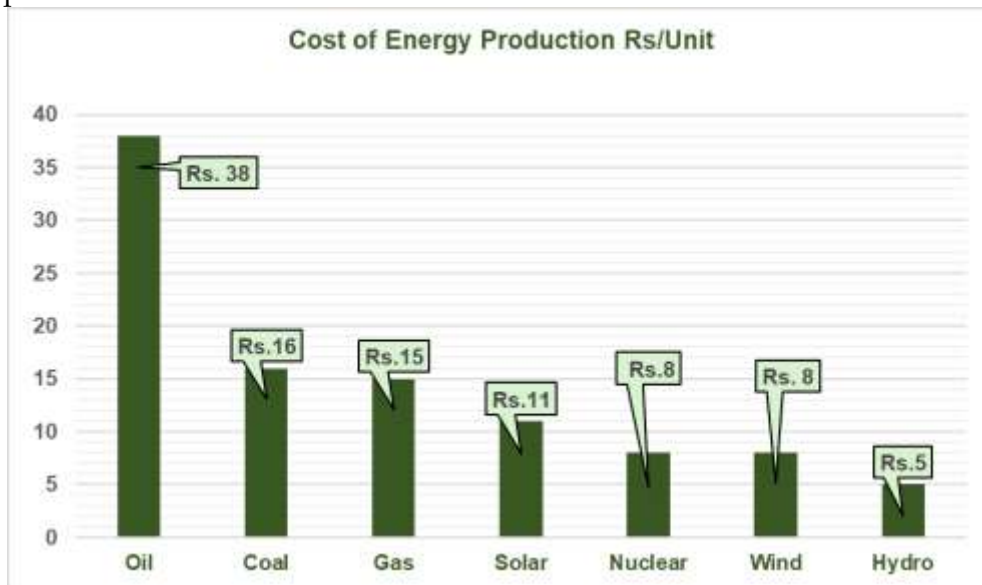
Thermal energy dominates Pakistan's energy production, contributing nearly 60% (Ghumman, 2024) of the total energy production mix. Limited investment in renewable sources as well as hydel energy perpetuates this dependency. Since the electricity produced through thermal sources is most expensive leading to higher energy prices in Pakistan.



Source (ESP, 2025); Self-prepared.

### RELIANCE ON IMPORTED OIL FOR THERMAL ENERGY

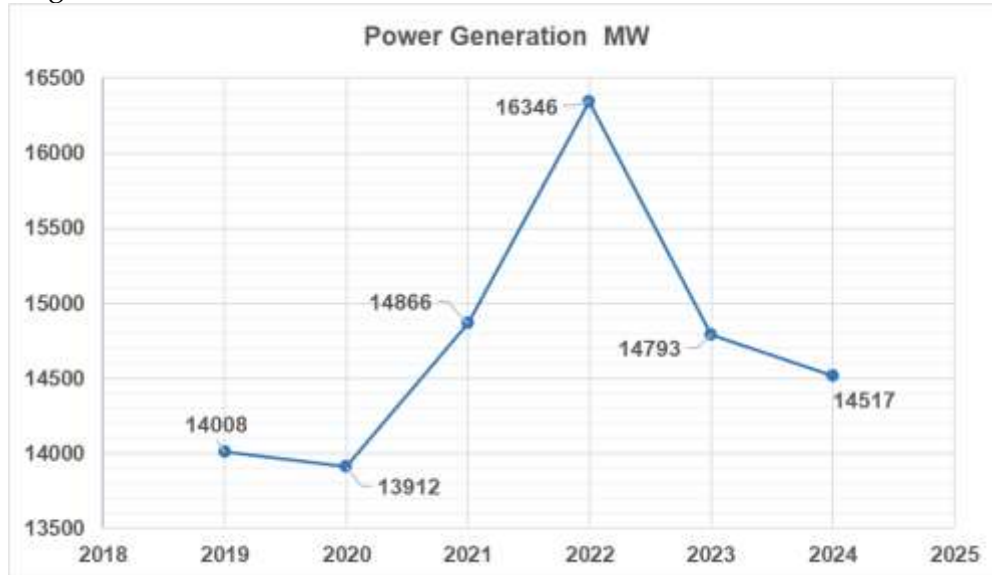
Thermal production requires crude oil as input fuel. Pakistan is highly dependent on imported oil and any increase in global oil prices directly escalates overall electricity production cost of the electricity. This not only increases the inflation in the economy but also increases the cost of production for businesses.



Source (Finance Division, 2025); Self-prepared.

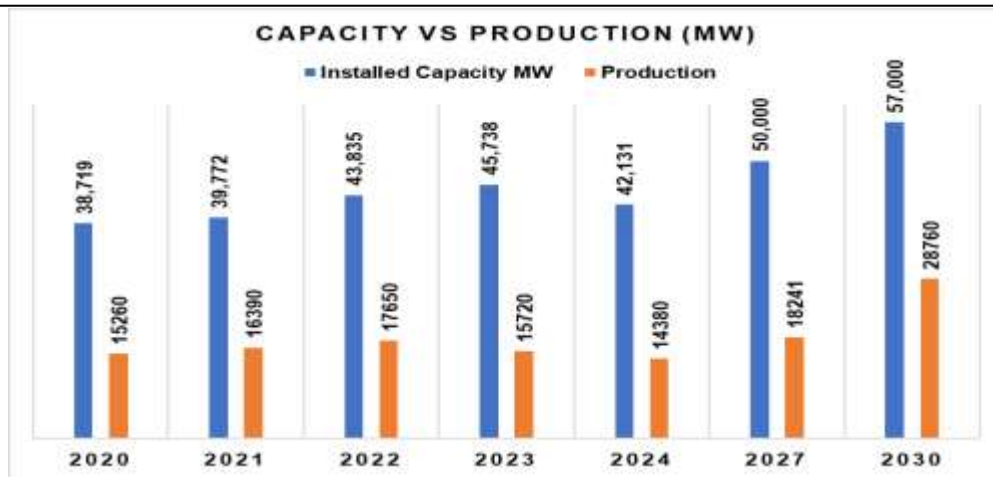
### EXCESS OF INSTALLED ELECTRICITY CAPACITY OVER DEMAND

It's astonishing to note that Pakistan has witnessed a significant decrease in power production during the past couple of years, which attributes to low demand for the energy. In the year 2022, Pakistan touched its peak production of 16,346 megawatts of electricity which dropped to 14,517 megawatts in 2024.



Source (ESP, 2025); Self-prepared.

The following graph shows a comparison between installed and produced energy for the last few years. It is evident that the installed capacity has witnessed a steady increase, and it is anticipated to reach 57,000 MW and next 5 years, but the demand has been significantly decreasing. Though the estimation of production and consumption is also anticipated to double but still it will remain half of the production. This surplus capacity leads to higher per-unit electricity costs due to capacity payments for unused power, exacerbating financial strains in the energy sector. Additionally, the excess capacity, coupled with reduced demand, has resulted in increased capacity charges in monthly bills of consumers, making electricity more expensive for end-users.



Source (Malik & Ahmad, 2022; ESP, 2025); Self-prepared.

### HIGHT COST OF THE ENERGY

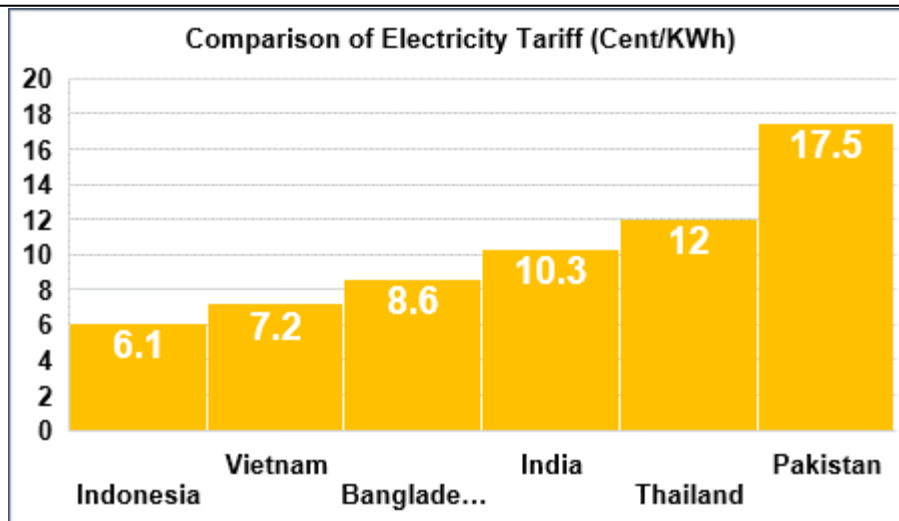
One of the factors in the declining trend of use of electricity is its higher cost. The high cost of energy in Pakistan significantly hampers its industrial competitiveness and difficult for domestic and commercial users. It is worth noting that the cost of the electricity in Pakistan has risen by 116% in last 08 years (Salik, 2024).



Source (ESP, 2025); Self-prepared.

This rising trend in energy costs puts extra pressure on the overall strained economic condition of the country. Particularly when it is compared to regional peers, most importantly India and Bangladesh, Pakistan industrial sectors losses the competitiveness.





Source (EnerData, 2025); Self-prepared.

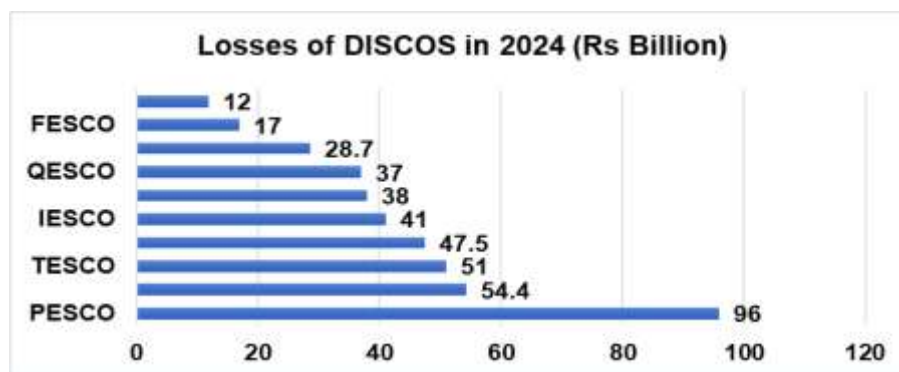
It ultimately inflates production costs, reduces export competitiveness and profitability of the country's industrial sector.

#### ***HUGE LOSSES OF TRANSMISSION AND DISPATCH***

18.31% of the transmission losses against NEPRA's target of 11.77%, which in term of amount makes Rs. 591 billion during 2024, is yet another challenge for the energy sector governance of the country (Ahmed, 2024). The major network of 220kV, 132kV and 500kV is almost 40 years old and requires an approximate \$3 billion annually for upgradation (Business Recorder, 2025).

#### ***POLITICALLY DRIVEN UNIFORM TARIFF SYSTEM***

Over a dozen electricity distribution companies and two separate gas distribution companies are operating in the country but a uniform tariff structure has been enforced nationwide. This practice undermines the efficiency of the performing companies and hides the inefficiencies of non-performing companies.



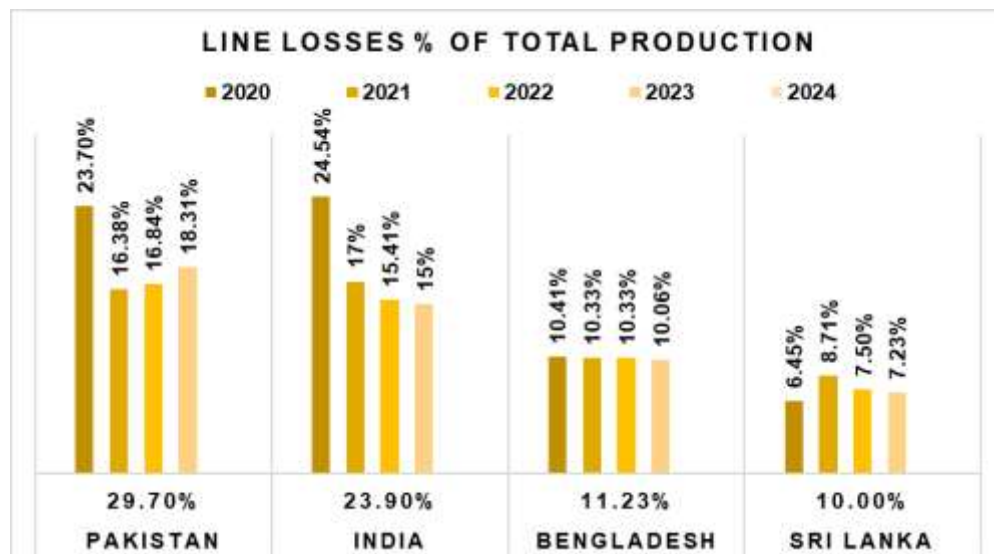
Source: (Rana, 2024; Ghumman, 2024); Self-prepared

Ideally, each company should calculate, and charge tariffs based on its specific delivery costs, consumption patterns, and line losses. However, for decades, the uniform tariff system has remained in place, forcing the federal government to adjust an annual subsidy of approximately Rs. 450 billion to PESCOs alone for stolen or unlawfully sold power for maintaining uniform power rates/slabs across the country.

The same principle applies to gas distribution companies, further exacerbating financial inefficiencies.

#### **CAPACITY GAP:**

The Government has planned to increase the capacity to 57000+ megawatts by 2030 (SOP, 2025). However, the existing transmission lines and the grid system is capable of transmitting only 22000 megawatts of the energy, which can be forced to increase to 27000 megawatts maximum for shorter periods of time (Jaffer, 2024; Kugelman, 2015).



*Source (ESP, 2025); Self-prepared.*

This ultimately increases financial strain on consumers, elevates production costs, and deteriorates their competitiveness. In terms of money, accumulative line losses are in billions of rupees.



Source (ESP, 2025); Self-prepared.

### **INCREASING TREND OF SOLARIZATION**

Due to higher electricity tariffs and uncertainty of electricity supply, domestic consumers and industrial units are switching towards solarization, thus lowering the energy demand from the national grid. 1718 megawatts of solar energy have already entered the national grid, solar panels of 7000+ megawatts capacity have been imported, and 4742 net metering applications are pending for approval at NEPRA (Khan, 2024). This trend is being seen as a threat to ability of the government to handle IPPs.

### **GAS SECTOR CHALLENGES**

#### **MONOPOLY OF SNGPL AND SSGCL**

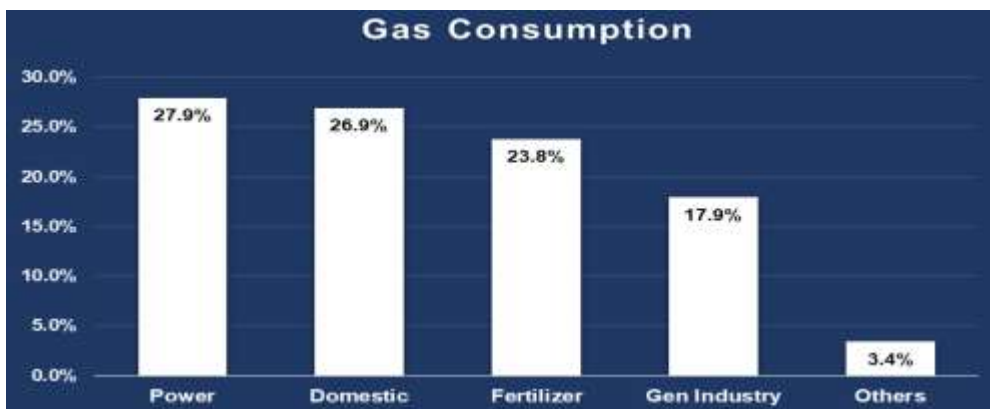
OGRA Ordinance 2002 envisioned the introduction of private companies into the distribution domain to create an efficient and competitive gas distribution framework. However, over time, the two state-owned companies not only solidified their financial standing as profit-generating entities listed on the stock market but also established a dominant influence over OGRA. As a result, even after an additional 14 years, no private entity has been permitted to enter the domain, effectively stalling the intended reform.

#### **CIRCULAR DEBT OF GAS SECTOR**

Accumulated circular debt of gas sector is Rs 2.8 trillion (Kiyani, 2024). Maintaining low prices of gas for a long period, line losses, thefts, and non-inclusion of RLNG in Gas Basket has disrupted the financial stability of the whole supply chain of gas sector.



The industrial sector is one of the largest consumers of gas. 24% of the total production of gas is utilized for the production of fertilizers while 27% is utilized for power production in the industrial sector.



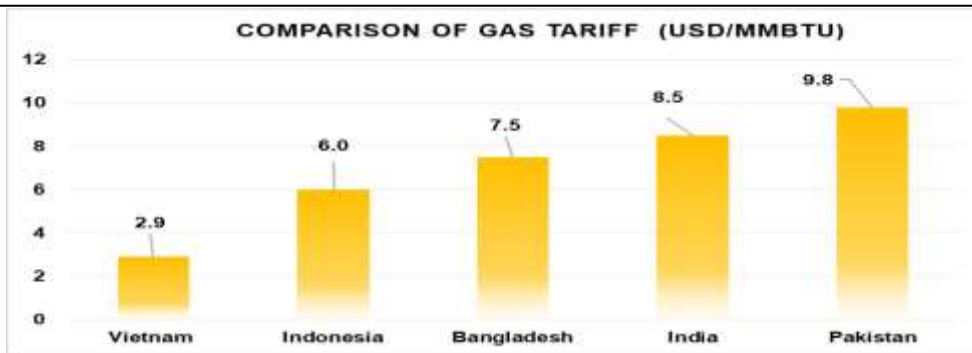
Source (ESP, 2025); Self-prepared.

### **IMPORT OF EXPENSIVE LNG/RLNG**

Pakistan's reliance on imported LNG/RLNG strains foreign exchange reserves and worsens the trade deficit, especially with rising global prices. Currency depreciation further inflates LNG costs, while limited infrastructure restricts efficient distribution. Over-reliance on imports reduces focus on domestic exploration, increases debt burden, and exposes the country to geopolitical risks. Additionally, environmental concerns arise as LNG contributes to greenhouse gas emissions.

### **HIGH TARIFFS OF GAS**

Pakistan is having highest gas tariffs among the competing economies, most importantly India and Bangladesh. During the recent past, gas prices have significantly increased in the country which has not only affected the domestic users but also hampered the industrial use of gas.



Source: (EnerData, 2025); Self-Prepared

The rising trend of prices and the availability challenges also negatively impacting the industrial sector of the country.

Since 2015, Pakistan prioritized imported LNG over local exploration. However, rising global energy prices led to cancelation of shipments, which *has further aggravated the energy crisis*.

#### **STAGNANCY IN OIL & GAS EXPLORATION:**

Rising security threats, bureaucratic hurdles, huge circular debt, inconsistent policies and wrangling of provincial and federal governments on mineral exploration rights are among the reasons which have hindered the exploration activities. Gas reserves have been depleting at 9% per annum. (Bhutta, 2024) deteriorating the situation further.

UFG

Since November 2023, gas tariffs have seen a staggering hike of approximately 1100%. Provision of gas to huge number of consumers (over 700,000) in Karachi and likewise other places of the country is a major reason for gas pilferage and inclusion of unaccounted for gas component in the bills (Arif, 2025).

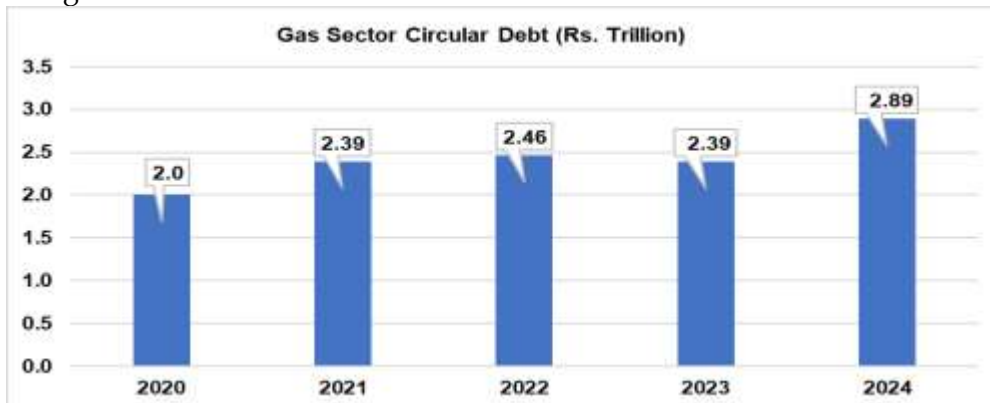
#### **CIRCULAR DEBT**

As of June 30, 2024, Pakistan's power sector circular debt reached a record high of Rs 2.393 trillion, increasing by Rs. 83 billion during FY 2023-24 (Jawad, 2024).



Source (Finance Division, 2025); Self-prepared.

The gas sector circular debt also stands at Rs. 2.89 trillion.



Source (Finance Division, 2025); Self-prepared.

These escalating debts exacerbates the fiscal deficit, diverts funds from essential public services, and deters investment in the energy sector. Consequently, it leads to higher electricity tariffs, increasing production costs for industries and contributing to inflation, thereby hindering economic growth.

### **HUGE CAPACITY PAYMENTS TO IPPS**

Independent Power Producers (IPPs), particularly those set up under the 1994 and 2002 energy policies, are considered as one of the main reasons for escalated electricity costs and rising circular debt. By FY 2025, capacity payments are estimated to reach Rs 2.1 trillion, equivalent to a charge of Rs 17.31 per kilowatt-hour (kWh). Moreover, the terms of recently concluded IPP agreements under CPEC are even more challenging than those of the earlier contracts. IPPs under CPEC are guaranteed a return on equity (ROE) of up to 20% in dollar terms which is significantly higher than the 12%-15% offered to other IPPs in Pakistan.

Chinese government made the capacity payments to their company's compulsory to ensure that Pakistani authorities do make sincere progress towards materialization of industrial development part of CPEC, which could not happen. This guaranteed return adds to the tariff structure making the issue more complex. In the wake of public agitation against the IPPs, the government has negotiated and revised contracts with 28 IPPs while contracts of few have been terminated. This may result in saving of Rs. 137 billion annually (APP, 2025). However, the issue is still a huge challenge for the government.

### **INACTION AGAINST IMPORT OF IRANIAN OIL**

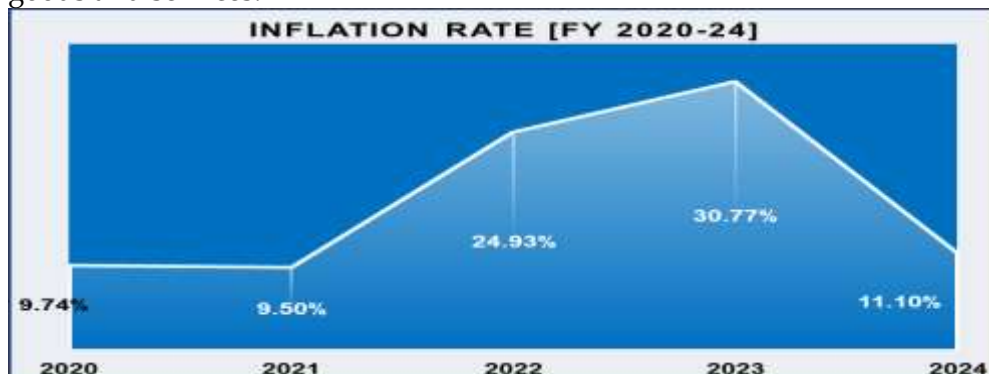
Another alarming issue is increasing scale of smuggled Iranian oil which has disrupted the local oil industry and causing Rs. 227 billion losses to the national exchequer annual (Kiyani, 2024).

### **CONSEQUENCES**

Consequences of energy sector challenges are highly damaging to industrial development, social and economic development and overall living conditions of general public in the country.

### **HIGHER INFLATION**

The rising inflation is one of the core consequences of energy sector inadequacies, adversely affecting the economy. Since the energy component is 36.61% in overall basket of CPI (CEICDATA, 2024), any hike in energy tariffs directly impacted the cost of living and increases production costs for goods and services.

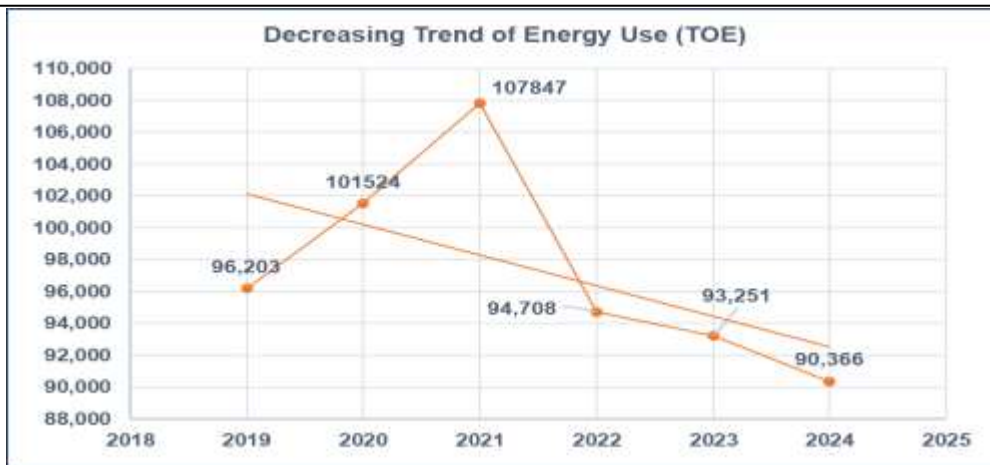


Source (Finance Division, 2025); Self-prepared.

Though inflation has seen a drop during the last year but the adverse effects of higher inflation on purchasing power of common people are still visible. The industrial sector also witnessed a substantial decrease in energy consumption in the past few years. A sharp decrease of almost 20,000 TOE<sup>6</sup> shows negative impacts of price hike and inflation.

<sup>6</sup> a unit of energy measurement that represents the amount of energy in a ton of crude oil.

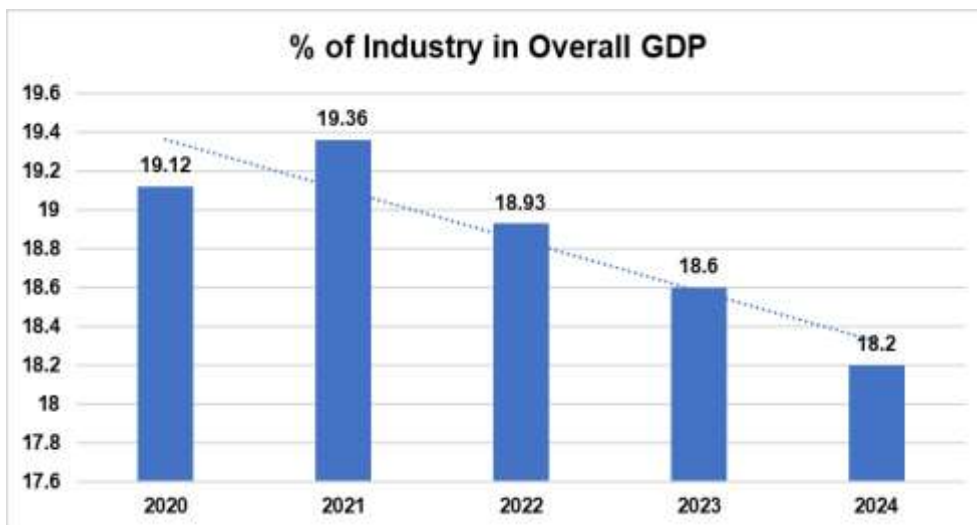




Source (ESP, 2025); Self-prepared.

### SHUTTING DOWN TREND IN INDUSTRIAL SECTOR

The surge in electricity tariffs in Pakistan has significantly impacted industries, leading to closures and production cuts. Approximately more than 8,000 businesses have closed operations in Pakistan and got themselves registered at Dubai Chamber of Commerce (Hussain, 2025). Around 81 industrial units, including 10 textile mills and five sugar mills, had been closed during the past five years due to the electricity crisis in the province (Siddiqui, 2024). Resultantly, the contribution of the industrial sector in overall GDP has been substantially decreased.

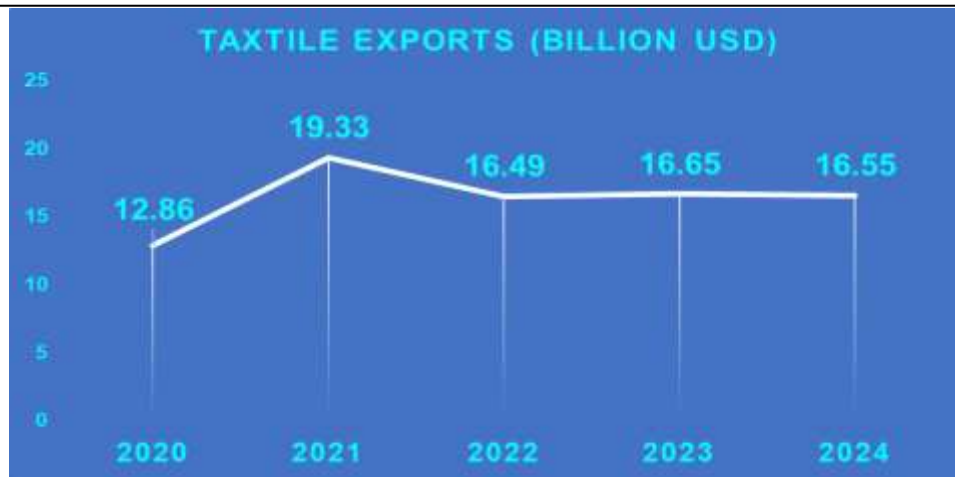


Source (ESP, 2025); Self-prepared.

### STAGNANCY IN TEXTILE EXPORT

The textile sector is the backbone of our economy's exports. Due to high energy tariffs, textile exports have been hit hard, and many textile units have been closed as they are unable to operate due to higher energy costs.

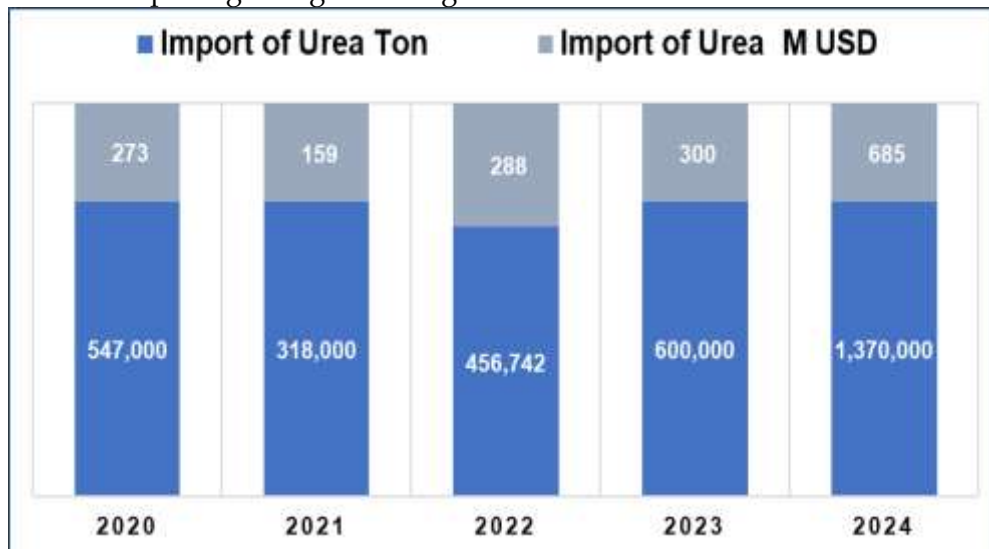




Source: (Sattar & Majeed, 2022; Profit, 2024); Self-prepared

### **DECLINE IN FERTILIZER PRODUCTION**

The fertilizer sector is confronting a crisis due to shortage of gas and not been able to cope up with fertilizer demand in the country. This has led to imports of urea on an annual basis not only affecting the agriculture sector but also depleting foreign exchange reserves.



Source: (Argus, 2025); Self-Prepared

### **LEGAL, INSTITUTIONAL AND POLICY ANALYSIS**

The energy sector of Pakistan is regulated by both federal and provincial power ministries, with key regulatory bodies such as OGRA, NEPRA, and PPIB overseeing generation and tariff fixation for domestic and industrial consumers. Distribution and transmission are managed by companies like NTDC, PESCO, SNGPL, and SSGC, which operate nationwide.

However, the sector is burdened by a complex, multi-layered regulatory framework, inter-governmental conflicts over mandates and powers, delayed bill payments, power theft, transmission losses leading to mounting circular debt, persistent supply shortages, and rising power tariffs.

### ***INSTITUTIONAL FRAMEWORK ANALYSIS***

#### **Private Power and Infrastructure Board**

The Private Power and Infrastructure Board (PPIB) Act 2012 established the PPIB as a statutory organization to facilitate private sector investment in Pakistan's power sector.

##### **Strengths**

Serving as a single point of contact for investors in the power sector. Encourages private sector participation in power generation and infrastructure along with execution of government policies related to private sector power projects and assists in the development of private power projects and facilitates investors in necessary approvals.

##### **Weaknesses**

The PPIB's role often overlaps with provincial energy departments and other federal agencies thus creating administrative inefficiencies due to concurrent mandates.

#### **Area for improvement**

PPIB's role should be expanded to prioritize renewable energy projects for a more balanced energy mix, while streamlining processes and clarifying roles with provincial energy departments and relevant agencies to reduce inefficiencies.

#### **NEPRA**

The National Electric Power Regulatory Authority (NEPRA) is responsible for regulating Pakistan's power sector, including setting electricity tariffs, promoting competition, and safeguarding consumer interests.

##### **Strengths**

NEPRA has contributed to tariff-setting process, aligning consumer costs and operational expenses.

##### **Weaknesses**

NEPRA has weak control over DISCOS and has failed to introduce a competitive market mechanism by privatizing public sector DISCOS or allowing private sector involvement in the distribution network.

#### **Area for improvement**

NEPRA needs to rationalize its regulatory functions to address provincial concerns and foster greater collaboration and reduce friction.

#### **OGRA**

The Oil and Gas Regulatory Authority (OGRA) is a key regulatory body in Pakistan, tasked with overseeing the oil and gas sectors.

Its primary responsibilities include setting tariffs for gas distribution, ensuring fair competition, regulating the exploration, production, and transportation of oil and gas, and protecting consumer interests. OGRA also monitors the performance of oil and gas companies, ensuring compliance with safety and environmental standards.

#### **Strengths**

OGRA provides oversight of the oil and gas sector, ensuring consumer protection and investor confidence.

OGRA has facilitated private sector investments in LNG terminals and related infrastructure.

#### **Weaknesses**

OGRA's centralized decision-making has led to disputes over natural gas allocation, royalties, and infrastructure development. Additionally, its lack of focus on security issues affecting oil exploration companies has contributed to the exit of multinational companies (MNCs) from the country perpetuating deficiency of indigenous energy resources.

Despite the clear vision outlined in the OGRA Act to involve the private sector by 2010, OGRA has failed to establish a competitive process by engaging private companies in gas distribution.

OGRA should endeavor to get powers regarding LNG/natural gas mixing in gas supply from distribution companies, address high levels of Unaccounted for Gas (UFG) added in bills @ 6-15%, and push for construction of Russia-backed gas pipeline.

### ***Integrated Generation Capacity Expansion Plan 2024-34***

In the light of Energy policy, NTDC has developed an Indicative Generation Capacity Expansion Plan (IGCEP) 2024-34. NEPRA has also approved this plan. The IGCEP is a revolving plan to be updated yearly to account for any change in generation technologies trends, governmental policies, progress/priorities of different projects etc. To provide a roadmap for the addition of new power generation capacities based on projected demand, ensuring reliability and cost-effectiveness.

#### **Strengths**

Analyses future electricity demand based on economic and demographic factors.

Evaluates available energy resources, including fossil fuels and renewables to determine optimal generation mix.

#### **Weaknesses**

The new IGCEP (2024-34) has reduced the share of variable renewable energy (VRE) from 30% to 12.9% contradicting local policy targets, while relying heavily on hydropower, which has been proposed to account for over 10,000 MW as 'strategic capacity' despite likely construction delays. This could exacerbate cost overruns and delays, reducing the share of cheaper renewable energy sources like wind and solar.

### **Area for improvement**

NTDC needs to revise the IGCEP to align it with the Alternative & Renewable Energy (ARE) Policy 2019 by increasing the share of renewable energy such as solar and wind, while reducing the reliance on costly and delayed hydropower projects. Integrating more RE will help lower costs and reduce dependence on large-scale, high-risk hydropower investments.

NTDC needs to introduce a rigorous evaluation process by engaging private field experts, to assess their real cost impacts and avoid unnecessary commitment to expensive projects.

### **National Electricity Policy 2021**

The National Electricity policy addresses various sectors, including generation, transmission, distribution, and market operations, providing directions for integrated planning and development.

### **Strength**

The Policy envisions to ensure access to electricity through a sustainable power sector, emphasizing optimal utilization of indigenous resources, integrated planning, efficiency, competitive market, affordability, and environmental friendliness.

It also focuses on cost-reflective tariffs, competitive wholesale market, transmission-distribution efficiency, uniform regulatory applicability, elimination of circular debt and reducing greenhouse gas emissions.

### **Weaknesses**

The policy lacks implementation roadmap and respective timelines. Further, it does not outline any plan for activating cheaper energy import projects like IP, Pakistan Stream Gas Pipeline (PSGP), TAPI, CASA 1000 etc.), and Thar Coal.

The Policy also lacks a concrete plan to resolve circular debt.

### **Area for improvement**

The policy should spell out mechanism for enhancing institutional coordination between Federal and Provincial authorities, fostering public-private partnerships (PPPs) to attract investment, incorporating energy efficiency and demand-side management strategies.

### **Alternative & Renewable Energy (ARE) Policy 2019**

Covers a wide range of renewable energy sources, including biogas, biomass, waste-to-energy, geothermal, hydrogen, solar, and wind.

### **Strengths**

Aims to harness Pakistan's renewable green energy potential through affordable energy solutions with aim to enhance renewable energy generation to 30% of total by 2030 (which currently stands at 6.8%) and to replace expensive fossil fuels.

### **Weaknesses**

The policy emphasizes off-grid solutions, however, lacks in providing strategy for these initiatives in rural and remote areas.

### **Area for improvement**

A single national platform, having representation of all provinces and federal stakeholders should be established to streamline bureaucratic processes to expedite project approvals.

Introducing financial incentives such as tax breaks/subsidies to attract large-scale investments in renewable energy projects.

Upgrade grid infrastructure to accommodate renewable energy, and foster public-private partnerships (PPPs) for off-grid solutions and renewable energy projects in rural areas.

### ***NATIONAL ENERGY EFFICIENCY AND CONSERVATION POLICY (NEEC) 2023***

The National Energy Efficiency and Conservation Policy (NEEC) 2023 outlines a range of measures aimed at enhancing energy efficiency in Pakistan's industrial sector which consumes 37.1% of the nation's energy. The policy has set target to save 2.3 million tons of oil equivalent (MTOE) and reduce carbon dioxide emissions of 9 million tons by 2030.

#### **Strengths**

The policy has been announced well before 2026, the year when E.U has announced to impose Carbon Adjustment Mechanism (CBAM) Tax on imports of carbon-intensive goods (mainly cement, electricity, fertilizers, iron and steel, aluminum, and hydrogen) into the EU.

#### **Weaknesses**

Weak enforcement mechanisms, fragmented governance between federal and provincial authorities, and insufficient institutional capacity at both levels could hinder the policy implementation.

### **Area for improvement**

The government may promote use of Electric vehicles (EV) by granting 100% tax waiver on EVs and impose ban on import of fuel charged automobile for a couple of years like Ethiopia.

The government must also provide clear financial subsidies/tax rebates especially to SMEs to promote energy-efficient technologies.

### **18th constitutional amendment**

The 18th Constitutional Amendment has granted provinces a 50:50 share in the royalty from natural and mineral resources. However, the powers to set tariffs and make decisions regarding revenue collection in this context still remain with the federal government.

#### **Strengths**

The 18th Constitutional Amendment granted provinces the right to share mineral royalties with the federal government and allowed them to generate their own power.

#### **Weaknesses**

The federal government has failed to consult provinces on oil and gas matters as required, leading to discord over legislative control of mineral exploration rights and causing legal ambiguities.

Provinces are now moving forward with their independent power generation system, transmission networks alongside establishing 'provincial power tariff determining authorities' to bypass the federal transmission systems

#### **Area for improvement**

The ambiguities regarding mineral exploration rights and power generation should be removed by the federal government through effective utilization of CCI.

### **SWOT-EETH ANALYSIS**

#### **Strengths of Energy Sector**

As per Alternative Energy Development Board (AEDB), Pakistan has vast potential of Solar (2.9 million MW), Wind Energy (50,000 MW), Hydel Potential (60,000 MW). Similarly, Pakistan has 186 bn tons of coal Reserves with potential to generate 100,00 MW. Similarly, Pakistan can act as potential energy transient hub due to its strategic location. Projects like TAPI and IPI highlight this potential.

#### **Enhancement of Strengths**

Pakistan must launch Competitive Trading Bilateral Contract Market (CTBCM) framework according to which Electricity Buyers (Industries etc.) and Power producers to directly negotiate and trade power through bilateral contracts. This would end the monopoly of Government and open up the opportunities for private sector generators to compete and supply electricity. As the CTBCM framework ensures competitive pricing and revenue predictability, it would encourage private sector to invest in Coal, Wind and Solar sector for utilizing un-tapped potential.

Weaknesses of Energy Sector and their Elimination Strategies

#### **High Electricity Tariffs and solution**

Industrial tariffs range between Rs. 55-60 per unit, causing industries to close and unemployment to rise. These tariffs include Energy Price and Capacity Payments, both of which are subject to GST. The Supreme Court has ruled that GST should not apply to Capacity Payments. Exempting them from GST would lower tariffs and help curb circular debt. (Kaleem, A. Personal Communication, 17.01.2025)

#### **Massive Power Circular Debt and solutions**

Currently the Power sector circular debt stands at Rs. 2.39 trillion. It has deterred the investment in Energy sector and disrupted the whole supply chain with cash shortage. Pakistan should enhance its reliance on cheaper energy like Wind and coal. Pakistan should also invest in existing Grid infrastructure to reduce line losses and renegotiate IPP contracts.

#### **Inefficient Discos and Solutions**

Transmission and Dispatch losses alone in FY 24 were 591 billion. This increases Circular debt of power sector.

It is proposed that instead of Privatizing Discos, we may introduce Independent Boards of by bringing specialist management from Market as per provisions of State-Owned Enterprise (Governance and Operation) Act, 2023. It is further proposed that instead of privatizing whole Discos we should Privatize the Feeders for efficient distribution and recovery.

### *Issues of Gas Circular Debt & Expensive RLNG and solutions*

During FY 24, the Gas sector Circular Debt has reached up to Rs. 2.8 trillion leading to disruption in Gas sector supply chain and Cash Shortage. Similarly, the expensive imported RLNG is being treated as separate fuel rather than being included in Gas basket. This resulted in non-recovery of cost of RLNG thus further increasing Circular debt. The proposed solution is implementation of Weighted Average Cost of Gas (WACOG) Law in true letter and spirit. As per this law, there would be a balanced price mechanism that would reflect the true cost of GAS including RLNG. Implementing WACOG would mean that the higher cost of imported LNG would be averaged with the lower cost of locally produced gas, resulting in a fairer price for consumers and Circular Debt would not increase as it will ensure full recovery of Cost of Gas.

### **IPPS, Capacity Payments and Solutions**

Contracts with IPPs have resulted in huge Capacity payments leading to circular debt and high electricity tariffs. The proposed solution is renegotiating the Purchase Power Agreements with IPPs to reduce the capacity payments. Another strategy to mitigate the impact of capacity payments is increased demand of electricity through industry expansion.

Stagnant Oil & Gas Exploration and Solutions:

Opportunities of Energy Sector and Taking Advantages of them  
Independent Electricity Market

The government has plans to launch Independent Electricity market from March 2025. This is an opportunity for Private sector power buyer and sellers to take part in directly in power trade without Government. Now it's the responsibility of the NEPRA to develop clear and transparent rules to govern trading, pricing and dispute resolution.

Renegotiation of PPAs with IPPs

Recently, the Cabinet has given approval of revised agreements with 14 IPPs with expected savings of Rs. 10 to 11 per unit of electricity tariff. This is a positive development as it would reduce the financial burden of Capacity Payments and would not allow Power Circular debt to escalate. The Government/Ministry of Energy Power Division should exploit this opportunity and further expand the negotiations with Others IPPs for revision of PPAs for reducing Capacity Payments.

Exploration of Thar Coal Indigenous Reserves

Pakistan has the largest coal Reserves equivalent to almost 176 billion tons. Already Sindh Engro Coal Mining Company under PPP model is working with Sindh Government.

PPIB can further identify opportunities with foreign investors on PPP mode to exploit these reserves through sharing resource, expertise and Risk and technology transfer.

#### Private Sector Ownership of New Gas Discoveries

Like Independent Electricity model, OGRA/SIFC should also work on this model to transfer ownership of certain percentage of new Gas discoveries to private sector. This decision will encourage investment in Oil and Gas exploration and will provide much needed liquidity in supply chain. Now it's the responsibility of the OGRA/SIFC to develop clear and transparent rules to govern trading, pricing and dispute resolution.

#### Threats of Energy Sector and Strategies to Hedge against them

##### Installed Capacity Exceeding Demand

This is the biggest threat right now Pakistan Energy Sector is facing that out of total installed capacity of almost 42,000 MW our average consumption is around 14,000 MW. This factor is the main cause of circular debt and high electricity tariffs. Capacity once installed cannot be reversed in short term, Therefore Pakistan should revive Industrial sector to enhance electricity demand.

##### Thermal Production Dependent upon Imported Oil

Due to stagnant Oil and Gas exploration sector, Pakistan's Thermal Production is highly dependent upon imported oil. Last year, Pakistan imported \$ 17 billion oil in FY 2024. (PBS, 2025). Any increase in global oil prices directly increases our energy tariffs. Similarly, any disruption in supply chain routes of oil supply due to the law-and-order situation will halt our thermal production. In order to hedge this threat, Pakistan should revive Oil exploration sector to increase local exploration of oil.

### ***GAP ANALYSIS UTILIZING OXFORD INDEX OF PUBLIC ADMINISTRATION***

The study has chosen India and Malaysia for comparison in the light of Oxford Index of Public Administration. India and Malaysia are at 50th and 40th position of the said index while Pakistan's is at 90th position. Both India and Malaysia are relevant case studies for Pakistan as Malaysia has recently emerged as a middle income and industrialized country in the wake of shifting of Japan to hi-tech industry while India is a close neighbor having identical governance and political structures.

### ***PAKISTAN ENERGY SECTOR COMPARISON WITH INDIA.***

#### Renewable Energy:

India ranks 3rd largest producer for renewable energy in the world, with over 125 GW of installed renewable capacity and having an ambitious target for 500 GW of renewables by 2030 (Singh, Ratn, & Jha. 2024). On the Other hand, Renewable energy accounts for less than 6.8% of Pakistan's energy mix. India's policy initiatives, such as the National Solar Mission, provide a robust framework for transitioning to clean energy.



#### Energy Efficiency Initiatives:

As per Bureau of Efficiency India, India has implemented comprehensive energy efficiency programs. India has launched Ujala Scheme in 2015 distributing energy-efficient LED bulbs to consumers at significantly reduced prices.

#### Energy Security and Diversification:

The energy mix in India is reasonably diversified including large investments in renewables, nuclear power, and domestic coal. Unlike Pakistan, 49% of Indian energy comes from Coal. Coal prices are much more stable than oil prices. Pakistan's is heavily relying on thermal resources, oil among the top, making energy security highly vulnerable and dependent upon price fluctuations in international market.

#### Foreign Investment and Partnerships:

India is among the most favored destination for energy investments, including renewable energy, nuclear energy, and grid modernization. India attracted \$13 billion in renewable energy investments in 2022 alone, with strong private-sector involvement (Myers, 2022) while Pakistan struggling to attract foreign investments due to political instability and security challenges.

#### Electric Vehicle (EV) and Charging Infrastructure:

India is witnessing significant growth in the electric vehicle (EV) sector, with government policies supporting EV manufacturing, charging infrastructure development, and incentives for consumers and manufacturers (Wagh, 2024). The FAME II scheme aims to promote electric vehicles and charging stations across the country. Pakistan is only beginning to develop its electric vehicle market and charging infrastructure, with limited government initiatives and a slower pace of adoption.

### ***PAKISTAN ENERGY SECTOR COMPARISON WITH MALAYSIA***

#### Energy Supply Reliability and Electrification:

Malaysia boasts nearly 100% electrification, ensuring reliable energy supply across urban and rural areas. The country has modernized its grid infrastructure, reducing transmission and distribution losses to around 6% (Merdekawati, Suryadi, Pangestika, & Zafira, 2024). Pakistan struggles with frequent power outages, and electrification rates in rural areas remain below 75% with an approximate annual \$5 billion losses due to unreliable power supply (Kugelman, 2015).

#### Energy Mix and Renewable Energy:

According to Malaysia Renewable Energy Roadmap Malaysia has a diverse energy mix, with a strong emphasis on renewable energy sources such as hydropower, solar, and biomass. Renewables contribute over 20% to the energy mix which is anticipated to be 31% by the end of this year and 70% by 2050 (ITA, 2024; Yahoo., Salleh., Chatri., & Huixin. 2024). While in Pakistan, the renewable energy accounts for approximately only 6%.

#### Energy Pricing and Affordability:

Malaysia provides subsidies and maintains regulated energy tariffs for consumers and industries to ensure affordability. For example, industrial electricity tariffs in Malaysia range between \$0.06–\$0.10 per kWh (Nadhila, & Setyawati., 2024). The Corporate Renewable Energy Supply Scheme (CRESS) Policy allows producers to directly negotiate electricity tariff rates with corporate customers, making the market more liberal (ITA, 2024). Energy prices in Pakistan are volatile and significantly higher due to dependence on imported fuels and inefficiencies in the energy supply chain. Industrial tariffs exceed \$0.19 per kWh, making production costs higher and the government maintains strict controls on the system.

**Policy Framework and Investment Climate:**

Malaysia's government has established clear policies, such as the Sarawak Corridor of Renewable Energy (SCORE), to attract investment in energy-intensive industries. The country attracted over \$13 billion in energy investments in 2022 alone (Teow, 2024) while Pakistan received only Rs. 800 million FDI in Power sector in FY 2024.

**Grid Resilience and Disaster Management:**

Malaysia has invested in modernizing its energy grid to make it resilient to natural disasters and climate-related risks. Advanced grid management systems and infrastructure upgrades ensure minimal disruptions which are at an average only 10 hours per year. Pakistan's grid infrastructure is outdated and highly vulnerable to disruptions caused by extreme weather, such as floods and heatwaves.

### ***COMPARISON WITH BEST PRACTICES - CHINA A CASE STUDY***

**Massive Investment in Energy Infrastructure by China:** China's energy infrastructure considered world's best which includes large-scale hydropower dams e.g., Three Gorges Dam 22500 MW, proposed Yarlung Hydroelectric Project (60,000 MW). It has also developed ultra-high voltage (UHV) transmission lines to efficiently transport electricity across long distances thus supporting industrialization. Pakistan should also Invest in large-scale infrastructure like hydropower (e.g., Diamer-Bhasha Dam) and modernize transmission and distribution systems to reduce losses and ensure a stable supply for industrial zones.

**Diversification of Energy Mix:** China has Reduced its reliance on coal by aggressively expanding renewable energy, now producing 308 GW of solar and 400 GW of wind power as of 2024 as per International Renewable Energy Agency. Pakistan can also learn from China that Pakistan should also invest in Solar, Wind and Hydro Power Projects in resource-rich region like Sindh and Baluchistan. Pakistan should also exploit its natural coal & gas reserves.

**Integration of Energy and Industrial Policies:** China has Created Energy-Industrial Zones, aligning energy production with industrial development, such as in the Yangtze River Economic Belt and Greater Bay Area as per World Bank Report on China Economic Zones.

China has leveraged energy subsidies and stable energy pricing to support energy-intensive industries like steel, chemicals, and electronics. Due to this China's cost of production is reasonably low as compared to other countries. Pakistan should also align CPEC Special Economic Zones (SEZs) with dedicated energy resources to ensure uninterrupted industrial operations. Stabilize energy pricing to make Pakistani industries globally competitive. Strategic Energy Cooperation and Financing: China has Secured international partnerships and financing for energy infrastructure projects, such as investments through the Belt and Road Initiative (BRI). It has also Partnered with global leaders for technology transfer in renewable energy and grid modernization. Pakistan should Strengthen energy collaborations under CPEC, focusing on technology transfer and financing for renewable and grid projects. Pakistan should Seek diversified foreign partnerships to reduce dependency on a single country and improve access to advanced energy solutions.

### ***ACTIONABLE LESSONS FOR PAKISTAN'S ENERGY SECTOR DEVELOPMENT***

#### **Diversification of Energy Mix:**

Both India and Malaysia have significantly diversified their energy portfolios. India focuses on solar and wind energy, while Malaysia invests in hydropower, solar, and biomass. Invest in Renewable energy sources like solar, wind, and hydropower to reduce dependency on imported fossil fuels. Encourage private sector participation in renewable energy development through incentives and simplified regulations. Diversification can improve energy security, reduce costs, and make the sector more resilient to global price shocks.

#### **Improve Grid Infrastructure:**

Malaysia has modernized its grid, reducing transmission and distribution losses to under 6%, compared to Pakistan's 17-19%. Pakistan should upgrade its Grid Infrastructure to reduce Transmission and Dispatch losses and improve efficiency and reliability. Modernized grid infrastructure would enhance supply reliability, reduce outages, and support industrial growth.

#### **Align Energy Policies with Industrial Growth:**

India has launched Integrated energy reforms with "Make in India" to support energy-intensive manufacturing industries. While Malaysia has Created industrial zones like the Sarawak Corridor of Renewable Energy (SCORE), offering affordable energy to attract global investors. Pakistan should also prioritize Energy access to its key industries like Textiles, leather and Fertilizer.

#### **Development of Electrical Vehicle Market and Infrastructure:**

Pakistan should Introduce a comprehensive EV policy with tax incentives, subsidies, and reduced GST, similar to India's Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme.

Pakistan needs to develop an extensive network of public and private EV charging stations, prioritizing urban areas and highways. Pakistan should facilitate affordable financing and leasing options to make EVs accessible to the wider population.

### ***POLICY GAP ANALYSIS***

#### **Desired State:**

The desired state of Pakistan's energy sector for industrial development should aim to provide reliable, cost-competitive electricity to boost productivity and competitiveness. Similarly, the electricity demand should be enhanced to utilize excess capacity of National Grid. This requires reducing electricity tariffs through renegotiation of capacity payments and improved efficiency in power generation and distribution. Diversifying the energy mix towards renewable and indigenous resources can lower costs and ensure sustainability. Revitalizing the exploration sector to reduce reliance on imports and addressing circular debt are critical. Finally, fostering industrial growth through tailored energy policies, such as special tariffs and uninterrupted supply for industries, can drive economic development.

#### **Current State:**

The current state of Pakistan's energy sector is marked by high electricity costs, surplus installed capacity, and a stagnant exploration sector, with an energy mix heavily reliant on expensive thermal power. This has resulted in a significant circular debt burden and massive capacity payments, straining fiscal resources. High tariffs and unreliable supply have reduced industrial competitiveness, discouraging investment and hampering growth. The exodus of consumers from the national grid further exacerbates financial pressures, while the lack of affordable energy access undermines industrial productivity and development potential.

#### **Policy Gap Analysis:**

Government should Review and renegotiate IPP contracts to reduce capacity payments for bringing down the electricity tariffs and Prioritize investments in renewable energy sources like wind and coal to reduce dependence on expensive thermal energy. Government should Incentivize local exploration of oil, gas, and coal reserves to reduce dependence on imported oil. Government should upgrade the Grid for reducing line losses and reduce theft and improve recovery to control Circular debt. Government needs to promote Electrical Vehicle usage.

### ***Conclusion:***

Pakistan energy sector is trapped in vicious cycle where Electricity Tariff is too much high for domestic and industrial consumers which has hampered the Industrial development and forcing Industrial and Domestic consumers to switch to alternate energy options by leaving National Grid as observed through Solarization Boom.

This is further reducing the electricity consumption of National Grid thus further increasing electricity tariffs for remaining consumers of National Grid due to fixed capacity payments charges under IPPs agreements. Lack of focus and investment in Renewable Energy Infrastructure has made Thermal Production the dominant contributor in Energy Mix. Oil and Gas exploration activities are minimal despite the fact that Pakistan's power production heavily dependent upon imported oil. The Findings of research calls for policy action in the form of practical recommendations through Tailored energy policies for ensuring that the Energy Sector may play its role in Industrial development of Pakistan.

## ***RECOMMENDATIONS***

### ***DEVELOPMENT OF INDEPENDENT ELECTRICITY MARKET***

Government should Implement Competitive Trading Bilateral Contracts Market (CTBCM) framework to allow private sector power generators and buyers to trade electricity independently of government following the footsteps of Malaysia. It would encourage the private sector to invest in Coal and Wind energy. This would ensure competitive pricing and revenue predictability

### ***RENEGOTIATIONS OF PPAS WITH THE IPPS***

After the successful negotiations with 28 IPPs, government should expand the exercise to remaining IPPs including the Chinese IPPs. Negotiations should focus on delinking Capacity Payments from \$ based to Rupee based. Similarly, the Government should also negotiate to reduce the Fixed Rate of return. This would reduce the Capacity payment charges and electricity tariff leading to enhanced Industrialization and use of National Grid/Electricity demand

### ***INTRODUCTION OF SMART METERING***

NEPRA should introduce Smart Metering across Discos to control theft and improve Recovery rate. This would also reduce line losses and encourage real time monitoring and billing. All this would increase the efficiency of Discos and will improve the financial health of Discos.

### ***PRIVATIZATION OF DISCOS FEEDERS***

Ideally Discos should be Privatized in phased manner, however, keeping the political considerations in view, as a first step, Government should privatize the Feeders of the Discos. This would enhance the recovery rate, reduce electricity theft, improve the operational efficiency and reduce the Circular Debt.

### ***INDEPENDENT BOARDS OF THE DISCOS.***

The government may bring market-based specialist management into the boards of DISCOS under the provisions of State-Owned Enterprise (Governance and Operations) Act, 2023. This would enhance the efficiency of Discos.

### ***REMOVAL OF GST FROM CAPACITY PAYMENT***

Currently, the GST is being charged from the consumers in the electricity bill on Energy Price (30%) as well as Capacity Payment (70%). As per orders of the Apex Court, GST should be applicable on energy price only. Delinking capacity payment component from GST would reduce electricity tariff, circular debt and promote industrialization and increase electricity demand/National Grid.

### ***REDUCTION OF TAXES IN ELECTRICITY TARIFF***

Currently the electricity tariff includes Federal Excise Duty, 17% Sales Tax, withholding tax and Income Tax etc. increasing unit price to Rs. 60. During the off seasons (winter), surplus energy should be provided to Industrial consumers at the cost rate to promote industrial activities.

### ***IMPLEMENT THE WACOG LAW 2022***

The Weighted Average Cost of Gas law should be implemented in letter and spirit to include all the cost of local gas production and imported LNG/RLNG to ensure that gas prices determined by OGRA include the cost of local and imported gas. This will stop the circular debt from further escalation. This step would also enhance the use of expensive surplus RLNG.

### ***INTRODUCTION OF PRIVATE SECTOR OWNERSHIP OF NEW GAS DISCOVERIES***

Like CTBCM Framework in Power Sector, OGRA and SIFC should also introduce a certain percentage of private sector ownership in newly but unallocated gas fields. This policy will alleviate liquidity crisis of exploration and production companies, attract FDI in Gas sector, reduce Gas circular debt, increase local gas production leading to reduced electricity tariff and enhanced industrialization and enhanced electricity demand/National Grid.

### ***GRADUAL SHIFT OF GAS FROM CPPs TO EFFICIENT GAS BASED GENERATION PLANTS***

Government has decided under IMF conditions to stop the Gas provision to Captive power plants. This would lead to immediate closure of Industry and unemployment. We should implement this measure in phase wise so that industry may continue, and gas may be shifted to more efficient plants and Industry start using National Grid leading to enhanced electricity demand and reduction in electricity tariff.

### ***OPERATIONALIZATION OF SEZs FOR INDUSTRY REVIVAL***

Board of Investment should put maximum efforts to operationalize existing SEZs. There are currently 13 SEZs under Provincial governments at various stages of approval. (Abdul Haq, S. Personal Communication. 17.01.2025). BOI should also provide necessary infrastructure to CPEC based Chinese IPPs. This step would enhance the Industrial activities leading to higher electricity demand.

### ***UPGRADATION OF TRANSMISSION LINES UNDER PPP MODE***

Under National Electric Policy 2021, NEPRA should undertake the project of upgrading existing transmission lines in phased manner. First upgrades should be undertaken to the extent that the gap between peak summer demand and transmission capacity can be bridged. As a second priority, necessary upgrades to transmission/distribution lines to SEZs, industrial states, and units should be made. This would reduce T&D losses and control circular debt.

### ***PROMOTE ELECTRIC VEHICLE POLICY***

Under National Electric Vehicle Policy, Government should provide necessary recharging infrastructure, provide subsidies and tax exemptions on EV procurement. Government needs to provide incentives to local and international manufacturers to establish EV production facilities in Pakistan. This would reduce the Pakistan's dependence upon imported oil and will increase electricity demand resulting into reduction of electricity tariff.

### ***REDUCTION OF MANAGEMENT FEE ON IMPORT OF LNG/RLNG***

Currently, PSO is charging 2.5% Management Fee on import of LNG/RLNG which makes it further expensive for local domestic and Industrial consumption. OGRA may take the matter with PSO and other LNG/RLNG importing companies to reduce the management fee for reduction in its local price for enhancing its use as Fuel for power generation.

### ***PROMOTE ENERGY CONSERVATION AND EFFICIENCY***

Under National Energy Efficiency and Conservation Policy 2023, The Government should encourage energy efficiency and conservation by launching programs like UJALA 2015 in India. Such programs should subsidize the use of LED bulbs for promotion of clean and efficient energy

### ***RESOLUTION OF DISPUTES BETWEEN FEDERAL AND PROVINCIAL GOVERNMENTS***

The 18th Amendment has allowed provinces to generate their own power. Provinces are now moving forward with their independent power generation system, transmission networks alongside establishing 'provincial power tariff determining authorities' to bypass the federal transmission systems. Such disputes should be resolved through effective utilization of CCI.

### ***REVISION OF IGCEP 2024-34 TO PROMOTE RENEWABLE ENERGY***

Under Alternative and Renewable Energy Policy 2019, Government plans to enhance Renewable Energy up to 30% in Energy mix. However, Integrated Generation Capacity Expansion Plan 2024-34 has proposed Renewable Energy target from 30% to 12.9%. NTDC needs to revise the IGCEP to align it with the Alternative & Renewable Energy (ARE) Policy 2019 by increasing the share of renewable energy such as solar and wind, while reducing the reliance on costly and delayed Hydropower projects.

***REVIVAL OF OIL & GAS EXPLORATION SECTOR***

Federal Govt should reduce/rationalize Windfall Oil Levy imposed upon Oil & Gas Exploration companies to enhance their profit margins for encouraging investment in this sector. Similarly, Exploration companies should also be provided adequate security specially in KPK and Baluchistan regions. This would reduce dependence on imported oil and will reduce electricity tariff due to low-cost indigenous Gas and Oils.

***APP BASED THEFT REPORTING SYSTEM FOR REDUCTION OF UFG  
LOSSES***

To mitigate Unaccounted for Gas losses, an App based Theft Reporting Mechanism with credit points for Whistle Blowers may be introduced to check UFG losses followed by deploying smart meters enabling accurate consumption monitoring and theft detection.



**LOG FRAME**

Action	Lead Implementer	Time
DEVELOPMENT OF INDEPENDENT ELECTRICITY MARKET	Ministry of Power, NEPRA	3-5 years
RENEGOTIATIONS OF PPAS WITH THE IPPS	Ministry of Power	Immediate
INTRODUCTION OF SMART METERING	NEPRA	1-2 Years
PRIVATIZATION OF DISCOS FEEDERS	Ministry of Power, NEPRA	1-2 Years
INDEPENDENT BOARDS OF THE DISCOS.	NEPRA	Immediate
REMOVAL OF GST FROM CAPACITY PAYMENT	Ministry of Power, FBR	Immediate
REDUCTION OF TAXES IN ELECTRICITY TARIFF	Ministry of Power, FBR	Immediate
IMPLEMENT THE WACOG LAW 2022	OGRA, Ministry of Petroleum	Immediate
INTRODUCTION OF PRIVATE SECTOR OWNERSHIP OF NEW GAS DISCOVERIES	OGRA, Ministry of Petroleum	2-3 years
GRADUAL SHIFT OF GAS FROM CPPs TO EFFICIENT GAS BASED GENERATION PLANTS	NEPRA, OGRA, Ministry of Petroleum & Power	2-3 Years
Operationalization of SEZs for Industry Revival	BOI	2-5 years
Upgradation of Transmission Lines Under PPP Mode	NEPRA	2-3 years
Promote Electric Vehicle Policy	Ministry of Power, NEPRA	2-5 years
Reduction of Management Fee on Import of LNG/RLNG	OGRA	Immediate
Promote Energy Conservation and Efficiency	Ministry of Power	2-5 Years
Resolution of Disputes between Federal and Provincial Governments	CCI, Cabinet	Immediate
Revision of IGCEP 2024-34 to Promote Renewable Energy	Ministry of Power & Petroleum	Immediate
Revival of Oil & Gas Exploration Sector	OGRA, Ministry of Petroleum	2-5 Years
App Based Theft Reporting System for Reduction of UFG Losses	OGRA, SNGPL, SSGPL	Immediate

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