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Policy Research Seminar
based on
**Public Policy
Simulation Exercise**
on
**Innovative Policy
Frameworks
for Enhancing Industrial
Development and
Economic Prosperity**

held on
June 3-4, 2024
at NIPA, Peshawar
During 40th MCMC



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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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- Five to six keywords should be provided;
- American English should be used;
- APA Manual of Style should be followed for Endnotes. In-text citations and bibliography are not required.;
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Special Issue: Innovative Policy Frameworks for Enhancing Industrial Development and Economic Prosperity

(This special issue consists of the proceedings of a 2-Day Public Seminar held on June, 3-4, 2024, on "Innovative Policy Frameworks for Enhancing Industrial Development and Economic Prosperity," conducted at the conclusion of the Public Policy Simulation Exercise during the 40th 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:*

I am honored to acknowledge the exceptional work presented in the *KJPP* special issue on the Simulation Exercise for Enhancing Industrial Development and Economic Prosperity, conducted during the 40th MCMC. The exercise has been pivotal in shaping Pakistan's future economic growth, offering valuable insights into key areas such as industrial development, technological advancement, and economic prosperity. The research topics explored reflect the complexity of our country's challenges and offer forward-thinking solutions aimed at transforming Pakistan's economy.

I extend my sincere gratitude to all the researchers and participants whose contributions are essential in laying the foundation for sustainable policies and industrial growth. The collaborative spirit and innovative approaches showcased throughout the exercise have the potential to improve Pakistan's global competitiveness. I am confident that the outcomes will serve as a vital reference for policymakers and industry leaders, driving long-term economic progress and positive change.

As we move forward, I look forward to the continued implementation of these groundbreaking ideas, knowing that they will create a lasting impact on Pakistan's industrial landscape. The collective effort and dedication of all involved reflect a shared commitment to a prosperous future, and I am optimistic about the transformative potential of this work in achieving our long-term development goals.

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 is with great pride and enthusiasm that we present this special issue of the *Khyber Journal of Public Policy*, published by the National Institute of Public Administration, Peshawar, a constituent unit of the National School of Public Policy. This issue focuses on the outcomes of the Simulation Exercise for Enhancing Industrial Development and Economic Prosperity, which was conducted as part of the 40th MCMC from April 29, 2024, to July 5, 2024. This exercise has been a crucial step in exploring innovative policy frameworks aimed at addressing the complex challenges faced by Pakistan's industrial and economic sectors. The research presented in this issue covers a wide spectrum of topics, each designed to provide forward-thinking solutions for enhancing industrial growth and economic development in Pakistan. The contributors have delved into pressing issues across a variety of sectors, from industrial policy to technology, energy, agriculture, and entrepreneurship. Through their work, they have provided invaluable insights and practical recommendations for policy reforms that can transform Pakistan's economic landscape.

The topics explored in this special issue include *Planning Minister's Task Force for Integrated Industrial Development Policy & Planning at Provincial and Federal Levels* by Neelum Sultana Khattak, Abdul Qadir, Muhammad Tanveer Javed, Habib ur Rehman, and Dr. Muqem ul Islam. The paper on *Enhancing High-Quality Automobile and EV Industry in Pakistan* by Sajid Khan, Muhammad Saleem, Muhammad Taufique, and Dr. Muqem ul Islam highlights strategies for advancing the automotive and electric vehicle industries. *Enhancing E-Commerce for Economic Development* by Sarah Shaikh, Ali Raza Khan, Syed Habib ul Hassan Gillani, and Jehanzeb Khan Orakzai explores how e-commerce can drive economic growth in the digital age.

Further, *Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, and Precision Agriculture* by Kamran Khattak, Muhammad Ayaz Khan, Muhammad Bilal Malik, and Shabidullah Wazir addresses the need for modernization in agriculture to increase productivity and ensure food security. *Enhancing FDI and Ease of Doing Business* by Noor Rehman, Maleeka Ahmed, Riaz Muhammad, and Muhammad Tayyab offers recommendations on improving Pakistan's investment climate.

In *Reforming Technical Education and STEM for Technological Advancement and Innovation*, Amir Hassan Khan, Jamshed Khan, Waqas Ahmed, and Muhammad Tayyab discuss how reforms in education can foster technological progress and innovation.

The issue also tackles Reforming the Energy Sector and Cost-Effective Sources of Energy for Industrial Development by Rahimullah Khan, Noor ul Amin, Jamal ud Din, and Shabidullah Wazir emphasizing the role of energy reform in supporting industrial growth.

PPP Mode for Industrial and Infrastructural Development by Touseef Khalid, Muhammad Nasir Khan, Shahnawaz Naveed, and Shabidullah Wazir explores the potential of public-private partnerships in accelerating infrastructure and industrial development. The paper on Creating a Conducive Environment for IT, Business, and Industrial Start-ups by Faisal Karim Qureshi, Kashif Iqbal Jilani, Sami ur Rehman, and Dr. Muqem ul Islam highlights the importance of fostering an entrepreneurial ecosystem in Pakistan.

Import Substitutions and Export Promotion for Improving the Balance of Trade by Shaista Ghazi, Muhammad Tanveer Khalid, Syed Mazhar Ali Shah, and Jehanzeb Khan Orakzai outlines strategies for improving the balance of trade by promoting exports and reducing reliance on imports. Lastly, Tapping Mineral, Oil, and Gas Resources for Economic Development by Qasim Ali Khan, Muhammad Abid Hussain, Sadia Chaudhry, and Muhammad Tayyab discusses the role of Pakistan's natural resources in driving economic growth.

The research in this special issue is a testament to the power of collaborative thinking and innovative problem-solving. The authors have not only addressed immediate challenges but have also provided long-term policy solutions that can guide Pakistan's industrial development and economic prosperity for years to come. We extend our heartfelt gratitude to all the contributors for their dedication, expertise, and vision, which have shaped the ideas and recommendations presented here.

As Pakistan continues its journey towards becoming a global economic powerhouse, the work presented in this journal will serve as a key reference for policymakers, industry leaders, and academics alike. It is our hope that these ideas will spark meaningful discussions and inspire action that leads to tangible improvements in Pakistan's industrial and economic sectors. We are confident that the policy frameworks and recommendations in this issue will contribute to the realization of Pakistan's long-term development goals and play a pivotal role in creating a sustainable, prosperous future for all.

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

Integrated Industrial Development Policy & Planning at Provincial and Federal Levels

Neelum Sultana Khattak¹, Abdul Qadir², Muhammad Tanveer Javed³ Habib ur Rehman⁴, Dr. Mugeem ul Islam⁵



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Abstract:

Industrialization is widely regarded as a key driver of economic growth and development. For Pakistan, implementing a comprehensive and integrated industrial policy is essential to overcome structural constraints and capitalize on opportunities in the global economy. This paper examines Pakistan's industrial journey, from early industrialization and nationalization to privatization and recent initiatives like the China-Pakistan Economic Corridor (CPEC). It highlights persistent challenges such as energy shortages, regulatory inconsistencies, and limited SME financing, which have constrained industrial growth. Recommendations include improving infrastructure, rationalizing land and taxation policies, enhancing ease of doing business, fostering innovation, and promoting export diversification. Furthermore, the policy must integrate sustainable practices and emphasize public-private partnerships to build a resilient industrial sector. Aligning with global value chains and leveraging Pakistan's geographical and resource advantages can position the country as a competitive player in the global industrial landscape, fostering inclusive and sustainable economic development.

Key words:

Industrial policy, economic growth, Pakistan, sustainable development, global value chains.

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Introduction

There is a general belief among economists, policymakers, and the general public that industrialization implies economic growth and development. Unless countries industrialize, the assumption goes, they will continue to remain undeveloped or underdeveloped. The progress of countries like South Korea, Taiwan, and other East and Southeast Asian countries, which have been called the Newly Industrialized Countries (NICs), only reinforces that view (Zaidi, 2005). According to Finance (2022–23), manufacturing holds a dominant position within Pakistan's industrial sector, contributing 12.01 percent to the country's GDP. The sector-wise contribution of each industrial sector to GDP is as follows:

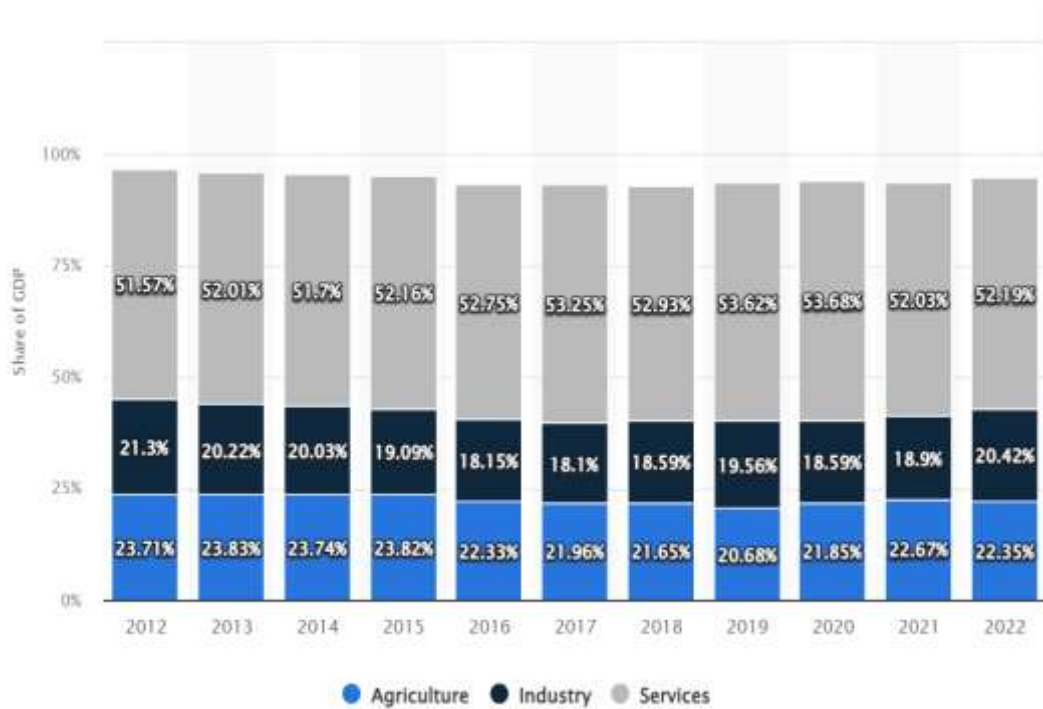


Figure 1

Source: <https://www.statista.com/statistics/383256/pakistan-gdp-distribution-across-economic-sectors/>

Integrated Industrial Development Policy

A developing country such as Pakistan needs an industrial policy to guide its economic growth and development strategies effectively. Industrial policy serves as a roadmap for achieving key objectives such as fostering industrialization, creating employment opportunities, promoting innovation and technological advancement, enhancing productivity, and diversifying the economy. By outlining targeted measures and interventions, industrial policy helps address market failures, overcome structural constraints, and capitalize on comparative advantages to build competitive industries. Additionally, industrial policy provides a framework for coordinating public and private sector efforts, attracting investment, facilitating trade, and integrating into global value chains. Overall, a well-designed industrial policy is essential for driving sustainable and inclusive economic development in a developing country.

Purpose of Integrated Industrial Development Policy

The globally recognized guidelines of the United Nations Industrial Development Organization (UNIDO) may be used to prepare the National Industrial Policy (NIP) for fostering sustainable economic growth. The NIP leverages both existing and emerging instruments to address the multifaceted challenges faced by Pakistan's industrial sector, ensuring alignment with national development goals and the global economic landscape.

Overview of Pakistan's Industrial Policies through various decade

Pakistan's uneven journey with industrial policy has been marked by shifts in strategies that mirror its broader economic, political, and social transitions. Since gaining independence in 1947, Pakistan has adopted various approaches to industrialization, each influenced by the prevailing economic philosophies of the time, the views of political leadership, and shifts in global and national economic conditions.

Early Industrialization (1947–1971)

In the initial years following independence, Pakistan's industrial policy focused primarily on building a base for heavy industry and import substitution to reduce reliance on foreign goods. The government established key institutions like the Pakistan Industrial Development Corporation (PIDC) to promote industrialization. However, this period also saw increasing income disparities and regional economic imbalances, including in parts of the then East Pakistan.

1. Era of Nationalization (1970s)

The early industrialization phase transitioned into nationalization during the 1970s, aiming to address economic disparity but yielding mixed results. Major

industries, banks, and educational institutions were nationalized. This move was intended to distribute wealth more evenly but instead caused inefficiencies in the economy and discouraged private investment. A large state-owned enterprises (SOEs) sector remains a legacy of this era.

2. Deregulation and Privatization (1980s–1990s)

The late 1980s and 1990s marked a significant shift as Pakistan moved towards liberalization, privatization, and deregulation. Policies focused on reducing the state's role in the economy, encouraging private sector participation, and attracting foreign investment. However, issues related to transparency and governance undermined public confidence in these reforms.

3. Post-2000s Industrial Sector

The government launched initiatives to promote sectors deemed to have a comparative advantage, such as textiles, agriculture, and IT. Policies were crafted to address the challenges of modernization, technology adoption, and innovation. As a result, key industries such as textiles, telecommunications, and construction experienced significant growth, leading to job creation and increased exports. Another paradigm shift occurred with the advent of CPEC, heralded as a game-changer for Pakistan's economy. However, implementation delays, security concerns, inter-provincial coordination issues, and challenges with profit repatriation slowed the pace of CPEC-related projects, limiting their impact on the industrial sector in the medium to long term.

Problem Statement

There is a general belief among economists, policymakers, and the general public that integrated industrial policy fosters economic growth and development in any country. However, the formulation and implementation of Integrated Industrial Policy and Planning in Pakistan face significant challenges at both provincial and federal levels, such as fragmented policy frameworks, regulatory inconsistencies, inadequate infrastructure, limited access to affordable financing, and a shortage of skilled labor. Therefore, the current situation necessitates a research endeavor to identify the root causes and challenges faced by the country in formulating and implementing an integrated industrial policy and to suggest feasible solutions in light of the lessons learned.

Scope of the Study

This study aims to analyze the policy framework for integrated industrial development at federal and provincial levels in Pakistan. It will also examine policy coherence, alignment, and will identify gaps that hinder industrial growth. The study evaluates policy frameworks, implementation and

coordination mechanisms, focusing on their impact on regional disparities. The goal is to provide actionable recommendations for enhancing policy integration and promoting balanced, sustainable industrial development in Pakistan.

Literature Review

One of the significant reasons for the sluggish industrialization in Pakistan is the prolonged absence of a dedicated industrial policy. Consequently, the roles such a policy would typically fulfill are being managed through other public sector policies related to investment, trade, and monetary matters. The SMEDA Act of 1998 was established to regulate small and medium enterprises (SMEs) by the federal government, followed by Vision 2025 (Burki, 2008). An SME policy was formulated in 2007, which has since been amended and is pending cabinet approval. The 18th Constitutional Amendment devolved Part I of the Federal Legislative List, including the industrial sector, to the provinces, transferring industrial affairs to provincial governments (MOIP, 2021). Frequent changes in government are a major contributor to policy uncertainty in Pakistan. Moreover, past governments have often implemented ad-hoc industrial policies in reaction to crises (Kemal, 2008). The conflict between federal and provincial industrial policies has further complicated the achievement of desired outcomes in the industrial sector (Burki, 2008). The Pakistan Business Council advocates for a "Make-in-Pakistan" initiative to drive industrial growth, leveraging Pakistan's domestic market of over 200 million consumers to develop scale and competitiveness, eventually addressing global demand (PBC, 2018).

Research Methodology

The research study employed a qualitative methodology, utilizing both primary and secondary data sources. Data was gathered from research articles, newspapers, and reports available online. Additionally, a round of interviews was conducted to delve deeper into the core issues. The collected factual and critical data was then analyzed using various methods including situational analysis, legal analysis, SWOT analysis, gap analysis, and log frame analysis

Situational Analysis

The first Integrated Industrial Policy is in draft state at federal level to be revived by the concerned stakeholders, however, sector specific policies of the following sectors exist:

- a) Fertilizers Policy-2021
- b) Electric Vehicle Policy-2022
- c) Mobile Device Manufacturing Policy-2020
- d) SME Policy-2021

Situational Analysis of Policies

National Industrial Policy

An Industrial Policy can be defined as government measures aimed at shifting production focus toward sectors with the potential to contribute significantly to economic growth—an outcome unlikely without such measures. A policy serves as a guiding document for both the government and the private sector, outlining long-term objectives to be achieved (Saggi & Pack, 2006). Historically, various governments have followed fragmented industrial development policies, but a single comprehensive policy focusing solely on industrial growth has never existed.

The Ministry of Industries and Production (MoIP) of the Federal Government is currently developing a National Industrial Policy (NIP 2021) with assistance from ADB. However, the details of this policy have not yet been made public. It is encouraging to see the government taking such an initiative, but it is noteworthy that successive governments have neglected this crucial policy area for decades. Following the 18th Amendment, the MoIP's role in industrial development was significantly reduced, with provinces being empowered to manage industrial matters. Nonetheless, international coordination and industrial policy formulation remain under the MoIP's mandate (MoIP, 2017).

Developing countries like Bangladesh have implemented clear industrial policies that have facilitated robust economic growth. These policies are revised every five years to adapt to changing circumstances (Financial Times, 2021). In contrast, Pakistan's industrial policy development has been erratic. Industrial policies were often not independent documents but were part of medium-term development plans or responses to crises.

Since independence, Pakistan has implemented five such policies:

1. The first was in 1949, following India's trade embargoes.
2. The second was integrated into the two five-year plans during Ayub Khan's era from 1960 to 1970.
3. The third policy emerged during PM Zulfikar A. Bhutto's tenure, who initiated the nationalization of industries.
4. The fourth policy was adopted during the democratic governments from 1988 to 1999.
5. The fifth was implemented during President Musharraf's rule.

Subsequent democratic governments largely followed past policies without establishing a comprehensive industrialization strategy (Burki, 2008). A National Industrial Policy was drafted during President Gen. Pervez Musharraf's period but was sidelined by vested interests. The history of industrial policymaking in Pakistan shows that incoming leaders heavily

influenced policy, often changing it with each new government. This lack of long-term planning has hindered industrial development, leaving Pakistan's industrial sector lagging behind other Asian economies.

Policymaking in Pakistan tends to be uneven, as illustrated by the case of industrial development. Ideally, the federal government should formulate a national policy upon which provinces could base their own policies. However, Khyber Pakhtunkhwa and Punjab developed their own industrial policies before the finalization of NIP 2021. This policy gap has negatively impacted the stagnant share of the industrial sector in the country's GDP. Small-scale manufacturing contributes a mere 2% to the national economy (PBS, 2021).

Despite its great potential, the government has prioritized it more than larger industries. For instance, SMEDA developed an SME policy in 2007 without a national industrial policy and revised it again with USAID's assistance. The policy is now awaiting cabinet approval.

Another noteworthy aspect is that almost all major policies in the country are being developed with international development partners' assistance. While this practice is beneficial, it does not build the departments' capacity to develop such policies independently, leading to dependency on foreign assistance.

There is always a need for a robust institutional framework to implement policy effectively. Additionally, the roles and coordination mechanisms among various government entities need to be clearly and fully elaborated. To bring Pakistan at par with its industrially advanced regional partners, its industrial policy must address concerns about the availability of financial and technical resources. Furthermore, it needs to outline a comprehensive plan for securing the necessary investments and technology transfers (Haque, 2023).

Situation Analysis of SME Policy-2021

The SME Policy 2021 of Pakistan is a comprehensive document aimed at fostering the growth and development of small and medium enterprises (SMEs) in the country. SMEs constitute approximately 90% of all enterprises in Pakistan, contribute 40% to GDP, and account for 80% of non-agricultural employment. This policy highlights several key features designed to create a conducive environment for SMEs, recognizing their critical role in economic development, job creation, and innovation.

Key Features of the Policy

Simplification of Regulatory Processes:

The policy aims to streamline regulatory procedures to reduce the burden on SMEs. It proposes reducing the number of licenses and permits required for SME operations and establishing one-stop-shops for regulatory compliance.

Enhanced Access to Finance:

Recognizing the challenges SMEs face in accessing finance, the policy introduces measures to improve credit availability. This includes the establishment of credit guarantee schemes and incentives for financial institutions to develop SME-friendly financial products.

Promotion of Market Access:

The policy emphasizes the importance of market access for SMEs, particularly through digital platforms and e-commerce. It aims to increase the digital literacy of SMEs and improve digital infrastructure to facilitate better market integration.

Support for Innovation and Technology Adoption:

To foster innovation, the policy encourages investment in research and development (R&D) and the adoption of new technologies. Subsidies and tax incentives are provided to support R&D activities within SMEs.

Skill Development and Entrepreneurship:

The policy focuses on enhancing the skills of the workforce and promoting entrepreneurship through various training programs and educational initiatives.

Lacunas in the SME Policy

While the SME Policy 2021 lays a strong foundation, several gaps have been identified in the literature:

Implementation Challenges:

The policy lacks a clear implementation roadmap. Effective execution requires detailed action plans and timelines, which are currently missing. Without a robust implementation framework, the policy's goals may not be fully realized (OECD, 2020).

Limited Focus on the Informal Sector:

A significant portion of SMEs operates in the informal sector, which is not adequately addressed by the policy. Integrating these informal businesses into the formal economy is crucial for comprehensive SME development (World Bank, 2021).

Inadequate Financial Inclusion:

Although the policy proposes measures to improve access to finance, it does not sufficiently address the underlying issues of financial literacy and the stringent requirements imposed by financial institutions. Enhancing financial literacy among SME owners and simplifying loan procedures are critical for better financial inclusion (ADB, 2021).

Lack of Customized Support Programs:

The policy does not differentiate between the needs of different types of SMEs, such as startups versus established businesses, or high-growth versus subsistence enterprises. Tailored support programs are essential to address the unique challenges faced by various SME segments (ITC, 2020).

***Situational Analysis of KP Industrial Policy, 2020
Revival and Rehabilitation***

The "Revival and Rehabilitation" pillar focuses on restoring the health of sick and closed industrial units while improving existing infrastructure. This involves mapping and analyzing these units to identify opportunities for their revival. Key measures include providing financial and non-financial incentives and ensuring an uninterrupted supply of utilities like electricity and gas through coordination with relevant stakeholders.

The goal is to restore 25% of these units within the next five years, thereby enhancing the robustness of the supply chain and reinstating the confidence of entrepreneurs. Concurrently, rehabilitation efforts center on upgrading road networks, waste management systems, and ensuring consistent utility provision in current Economic Zones (EZs) and Special Economic Zones (SEZs). Public-private partnerships and government initiatives play a significant role in meeting these infrastructure demands, facilitating smoother operations, and attracting further investments.

Growth

The "Growth" pillar aims to foster a conducive environment for industrial expansion by developing a skilled workforce tailored to industrial needs. It emphasizes equitable and strategic development of new economic zones, support for SMEs, and a comprehensive framework for one-window facilitation. By leveraging indigenous natural resources and focusing on value addition, the policy seeks to enhance industrial output and drive economic growth in the province.

Competitiveness

To boost "Competitiveness," the policy outlines measures to improve the ease of doing business and enhance the regulatory landscape. Initiatives include attracting foreign investment, promoting public-private partnerships, developing a skilled workforce, and encouraging innovation. Sustainable

practices and the utilization of local resources are integral to creating a competitive advantage for the province's industries.

Analysis of the Legal Framework

The legal framework explains the existing legal tools to be used to assign responsibilities between various organizations for the tasks at hand.

Federal Legal Framework (Federal Level)

Under the Rule of Business, 1973, the Industries and Production Division is assigned the functions of:

1. National industrial planning and coordination,
2. Industrial policy,
3. Federal agencies and institutions.

In addition, the Ministry has also been assigned the task of promoting industrial productivity through the following measures:

- Promoting industrial productivity;
- Promoting special studies in the industrial fields;
- Testing industrial products.

Key Federal Laws and Policies

The primary purpose of these laws and policies is to create a conducive environment for industrial growth, sustainability, and competitiveness. Here's how each contributes to this overarching goal:

Industrial Policy Framework

National Industrial Policy (NIP) 2022:

This policy aims to enhance industrial competitiveness, promote sustainable industrial growth, and foster innovation. It includes provisions for public-private partnerships, technology transfer, and skill development (Ministry of Industries and Production, 2022).

Special Economic Zones (SEZ) Act 2012: This establishes the legal basis for SEZs, providing incentives such as tax holidays and infrastructure support to attract investment (Government of Pakistan, 2012).

Environmental Regulations: Industrial development poses significant environmental implications, not only for the host country but also for the rest of the world. Therefore, the observance of environmental rules and regulations must be adhered to in order to avoid both domestic and international reactions. To make industries more environmentally friendly, the Government of Pakistan has formulated various laws, rules, and regulations as explained in the following section:

Pakistan Environmental Protection Act 1997: This Act aims to provide for the protection, conservation, rehabilitation, and improvement of the environment, the prevention and control of pollution, and the promotion of sustainable development. It regulates industrial activities to prevent and control pollution, ensuring that industrial development is environmentally sustainable (Government of Pakistan, 1997).

Investment and Trade Laws: These laws maximize the contribution of investment to development growth, particularly in the context of trade policy by encouraging technology transfers and other linkages that promote growth.

Foreign Private Investment (Promotion and Protection) Act 1976:

This Act provides legal protection to foreign investments, encouraging international investment in the industrial sector (Government of Pakistan, 1976).

Trade Organizations Act 2013:

This Act governs the formation and functioning of trade bodies, facilitating industrial and commercial activities (Government of Pakistan, 2013).

Legislation regarding Land Requisition and Resettlement

- a) In its meeting of October 1, 2020, the ECNEC approved the establishment of a separate unit comprising 3-5 officials fully trained in each provincial revenue board for land acquisition and resettlement to facilitate the smooth implementation of infrastructure-related projects (Initiatives, 2021).
- b) In the case of land acquisition, land will be procured under a separate project at market rates with a resettlement plan to avoid litigation issues and delays in implementation.
- c) For provincial and special area projects, to be financed either fully or partially by the federal government, the land will be provided free-of-cost by the provincial or special areas' governments.
- d) In the case of mega projects and water sector projects, a separate PC-I for land acquisition should be prepared if required.

Provincial Legal Framework

Post-18th Amendment, provinces have gained significant autonomy over industrial development. Each province has developed its own legal and regulatory framework to promote industrial growth tailored to regional needs. Here, we will take the example of Khyber Pakhtunkhwa province:

KP Industrial Policy 2020:

- a. This policy emphasizes industrial diversification, investment in renewable energy, and the development of industrial zones (Government

of Khyber Pakhtunkhwa, 2020). A few major rules related to industries in the province include:

- b. KP Environmental Protection Act 2014
- c. Sarhad Development Authority Act, 1972
- d. Mines & Minerals Act 2017
- e. Pakistan Urban Immovable Property Tax Act 1958
- f. Tobacco Development Cess
- g. Hotel Tax Rules 2003
- h. Development Authorities and District Government Legislations (e.g., PDA, KDA)

Institutional Analysis

Federal Level:

- Ministry of Industries and Production (MoIP): Central to the IIDP, the MoIP is responsible for policy formulation, coordination, and oversight. It ensures the alignment of industrial policies with national economic goals.
- Board of Investment (BOI): Facilitates investment in the industrial sector by providing incentives, regulatory support, and assistance to investors.
- Ministry of Communications/NHA: Efficient Road networks play a vital role in connecting industries to sources (raw materials/inputs), ports, and consumers.
- Ministry of Railways: Railroads are essential to the economy, moving freight that contributes to national and international competitiveness.
- Ministry of Finance/SBP: The Ministry of Finance, through exchange rate stabilization and tax incentives, contributes to strengthening industrial productivity.
- Ministry of Commerce/TDAP: Works on national policies to maximize exports of goods and services from Pakistan and devises relevant strategies and plans to achieve export targets, which will directly enhance the performance of SEZs.
- Pakistan Bureau of Statistics (PBS): Provides critical data and statistical analysis to inform policy decisions and track industrial growth.
- Research & Development (R&D): Enhances R&D to support relevant industries such as PCSIR, NARC, etc.
- Special Investment Facilitation Council (SIFC): The SIFC will primarily concentrate on investment and privatization in five critical areas: Defence, Agriculture, Minerals, Information Technology and Telecommunications, and Energy.
- SECP: Responsible for regulating and supervising the corporate sector and capital markets. It ensures that investors have access to reliable information and are protected against fraud and market manipulation. It helps develop new financial products and instruments that can attract foreign investment and promote the growth of capital markets. In

addition to its regulatory role, the SECP also plays a vital role in promoting good corporate governance.

- Federal Board of Revenue (FBR): FBR has launched a trade facilitation program for businesses such as:
- Authorized Economic Operators: Maximum facilitation for trusted business entities by all government departments.
- Adjustment of Business Losses
- Tax Credit for Industrial Promotion
- Immunity from Probe for Industrial Investments
- The FBR will handle tax breaks and duty exemptions.
- The SBP or Special Purpose Vehicles (SPVs) will manage credit schemes, aiming for simplicity and ease of implementation.
- Planning Commission/China Pakistan Economic Corridor (CPEC): CPEC is based on the following major collaborative projects/initiatives:
- Construction and development of Kashgar-Islamabad, Peshawar-Islamabad, Karachi, Sukkur-Gwadar Port, and Dera Ismail Khan-Quetta-Sohrab-Gwadar road infrastructure
- Capacity expansion of existing railway lines (specifically ML-1, which is of strategic importance under CPEC)
- Promotion of cross-border optical fiber cables between China and Pakistan
- Promoting the construction of major projects in thermal power, hydropower, coal gasification, and renewable power generation
- Competition Commission of Pakistan (CCP): Anti-competitive business conduct can have harmful effects on the level of competition in the economy and thus on consumers.
- Ministry of Maritime Affairs: The shipping industry holds paramount importance in any economy in today's globalized world, as 80 percent of world trade is carried out through the sea. Over 90 percent of Pakistan's trade by volume is through the sea.

2. Provincial Level:

- Provincial Departments of Commerce and Industries: These departments in Punjab, Sindh, KPK, and Baluchistan are responsible for implementing industrial policies at the provincial level, addressing local industrial needs and challenges.
- Provincial Boards of Investment: Promote investment in the provinces. Punjab BOI, Sindh BOI, KP BOI, Baluchistan BOI
- Culture & Tourism Department: KP has strong potential in this sector.
- Small Industries Development Board: SIDB has established training and manufacturing centers for wood working, automotive, carpet, knitting, weaving, stitching, and leather goods.
- Provincial Revenue Authorities: Collect tax on services in the provinces, such as KPRA, PPRA, SRA, BRA.

- Provincial Highways Authorities: Promote intra-provincial road networks, e.g., PKHA, PHD, DHD, C&W Departments.

3. Private Financial & Non-Financial Institutions:

- Federation of Pakistan Chambers of Commerce and Industry (FPCCI)
- Provincial Chambers of Commerce and Industry
- Sectoral Industrial Associations: e.g., APTMA, PAMA, Labor Unions, etc.
- Commercial Banks: Provide necessary funding for industrial projects, working capital, and expansion plans.
- Development Finance Institutions (DFIs): Offer long-term financing and technical assistance for industrial development projects.
- Microfinance Institutions: SME Bank, ZTBL, Jazz Bank, Akhuwat, etc.
- Universities and Research Centers: Conduct research on industrial technologies, innovation, and sustainable development, and assist in technology transfer.
- Think Tanks: Offer policy analysis, research, and recommendations to improve industrial policies and their implementation. For instance, PIDE, AERC etc

4. International Organizations and Donors

- These organizations also play a vital in policy direction and regulations of the industrial sectors i.e. World Bank, IMF, FAO, Asian Development Bank (ADB), IFAD etc
- **HR Development Institutes:** NAVTTC, Provincial TEVTAs

5. Media

Media can play a significant role through advertising the salient feature of and objectives of the industrial policy.

Comparative Analysis of Pakistan's Integrated Planning for Industrial Development with the Best Practices around the World.

Integrated development planning is a strategic approach that harmonizes economic, social, and environmental goals to foster sustainable growth. In Pakistan, integrated development planning has been employed to address multifaceted challenges and achieve comprehensive development objectives. A comparative analysis of Pakistan's integrated development planning practices with those of leading nations such as China and India reveals insightful contrasts and similarities. China's robust, centrally coordinated planning model has propelled rapid urbanization and industrialization, while India's decentralized approach promotes regional autonomy and innovation. Understanding these global best practices provides valuable lessons for enhancing Pakistan's development strategies, ensuring inclusive and sustainable growth. As noted by experts, "integrated development planning can significantly improve socio-economic outcomes by aligning policies with sustainable development goals" (Doe, 2023, p. 45)

1. China

China's path to achieving industrial development involved a series of strategic steps and policies, many of which were critical in transforming the country into a global manufacturing powerhouse. Key measures included:

- **Economic Reforms and Open Door Policy (1978):** Initiated by Deng Xiaoping, these reforms shifted China from a centrally planned economy to a more market-oriented economy, encouraging foreign investment and private entrepreneurship (Naughton 2007).

- **Special Economic Zones (SEZs):**

The establishment of SEZs such as Shenzhen, Zhuhai, and Xiamen provided tax incentives, reduced tariffs, and infrastructure support to attract foreign direct investment (FDI) (Wei, 1995).

- **Investment in Infrastructure:**

Massive investments were made in transportation, energy, and communication infrastructure, facilitating industrial growth and improving connectivity within the country (World Bank, 2019).

- **Focus on Education and Skill Development:**

China significantly invested in education and vocational training to create a skilled workforce capable of supporting high-tech and advanced manufacturing industries (Bloom, Canning, & Chan, 2006).

State-Led Industrial Policy:

The government strategically directed investments into key industries such as steel, automotive, electronics, and later high-tech sectors like robotics and biotechnology (Yusuf, Nabeshima, & Perkins, 2006).

- **Innovation and R&D:**

Substantial funding for research and development was provided, coupled with policies encouraging innovation and the adoption of new technologies (Liu, 2015).

- **Global Expansion and Trade:**

Policies encouraging Chinese companies to invest abroad and acquire foreign technology and brands, along with active participation in global trade organizations, helped integrate China into the global economy (Buckley, Clegg, & Wang, 2002).

The key lessons learned from China's best practices highlight the importance of good infrastructure and effective organization and management. Essential components include a focus on security, policy support, investment promotion, environmental governance, service-oriented management, and the introduction of talent. These practices indicate that geography, resources,

market, human resources, and capital are crucial for the success of Special Economic Zones (SEZs). For Pakistan, SEZs should be located in areas with excellent transport, logistics, and local industry. Additionally, a high concentration of talent, innovative human resource policies, access to quality financial markets, investment facilities, and essential resources are vital for their success (Naughton, 2007; Wei, 1995).

2. India

India's industrial development has been driven by a series of strategic initiatives and policies aimed at fostering economic growth, enhancing competitiveness, and attracting investment. Key measures include:

- **Economic Liberalization (1991):**

Initiated economic reforms that reduced government control over businesses, opened up markets, and encouraged private investment. These reforms included deregulation, reduction of tariffs and taxes, and the privatization of state-owned enterprises (Panagariya, 2008).

- **Make in India Campaign (2014):**

Launched to transform India into a global manufacturing hub by encouraging companies to manufacture their products in India. This initiative focused on reducing regulatory burdens, improving infrastructure, and providing incentives for foreign direct investment (FDI) (Department of Industrial Policy & Promotion, 2014).

- **Special Economic Zones (SEZs):**

Established to provide tax incentives, simplified regulations, and infrastructure support to attract foreign and domestic investment. There are 270 SEZs in India, such as Noida, Maharashtra, Cochin Special Economic Zone, etc. SEZs aim to boost exports and create jobs (Aggarwal, 2006).

- **Skill Development Initiatives:**

Programs like Skill India were introduced to enhance the capabilities of the workforce, focusing on vocational training and education to meet the demands of various industries (Ministry of Skill Development and Entrepreneurship, 2015).

- **Infrastructure Development:**

Significant investments in transportation, energy, and communication infrastructure to support industrial growth. Projects like the Bharatmala and Sagarmala aim to improve road and port connectivity (NITI Aayog, 2018).

- **Digital India Initiative:**

Launched to improve digital infrastructure, increase internet connectivity, and promote digital literacy, thereby supporting industrial and economic activities (Ministry of Electronics & Information Technology, 2015).

- **Ease of Doing Business Reforms:**

Implemented various measures to simplify regulations, improve transparency, and reduce bureaucratic hurdles, such as the introduction of the Goods and Services Tax (GST) and the Insolvency and Bankruptcy Code (IBC) (World Bank, 2020).

India's industrial development has been driven by strategic initiatives that foster economic growth, enhance competitiveness, and attract investment. Pakistan can learn from these efforts to boost its own industrial sector. India's 1991 Economic Liberalization reduced government control, opened markets, and encouraged private investment (Panagariya, 2008). The 2014 Make in India campaign aimed to transform India into a manufacturing hub by reducing regulatory burdens and improving infrastructure (Department of Industrial Policy & Promotion, 2014). India's Special Economic Zones (SEZs), which offer tax incentives and simplified regulations, have boosted exports and job creation (Aggarwal, 2006). Skill development programs like "Skill India" have enhanced workforce capabilities through vocational training (Ministry of Skill Development and Entrepreneurship, 2015). Investments in transportation, energy, and communication infrastructure, exemplified by projects like Bharatmala and Sagarmala, support industrial growth and can serve as models for Pakistan (NITI Aayog, 2018). The Digital India Initiative, which improves digital infrastructure and promotes digital literacy, supports industrial activities (Ministry of Electronics & Information Technology, 2015). India's ease of doing business reforms, including the Goods and Services Tax (GST) and the Insolvency and Bankruptcy Code (IBC), have simplified regulations and reduced bureaucratic hurdles, offering further lessons for Pakistan (World Bank, 2020).

While all countries aim to enhance industrial growth and competitiveness, China and Singapore emphasize innovation and high-tech industries. India and Pakistan focus more on broad-based industrialization and employment generation, while Bangladesh targets diversification and reducing dependency on specific sectors (Smith, 2022).

Comparative Table of Industrial Growth Rates (2013-2022)					
Year	Pakistan (%)	China (%)	India (%)	Bangladesh (%)	Singapore (%)
2013	3.1	7.8	4.9	6	4.7
2014	3.6	7.3	7.5	6.3	3.5
2015	3.3	6.9	8	6.5	2
2016	4	6.7	7.1	6.6	1.1
2017	4.1	6.8	6.8	7.3	3.7
2018	4.4	6.6	6.5	7.9	3.4
2019	4	6.1	4	8.1	1.3
2020	4.2	5.8	-7.3	2.4	-5.8
2021	3	6	7.9	3.4	7.6
2022	3.2	5.7	8.2	5.2	3.5

Source: (WB, 2022)

Table 1

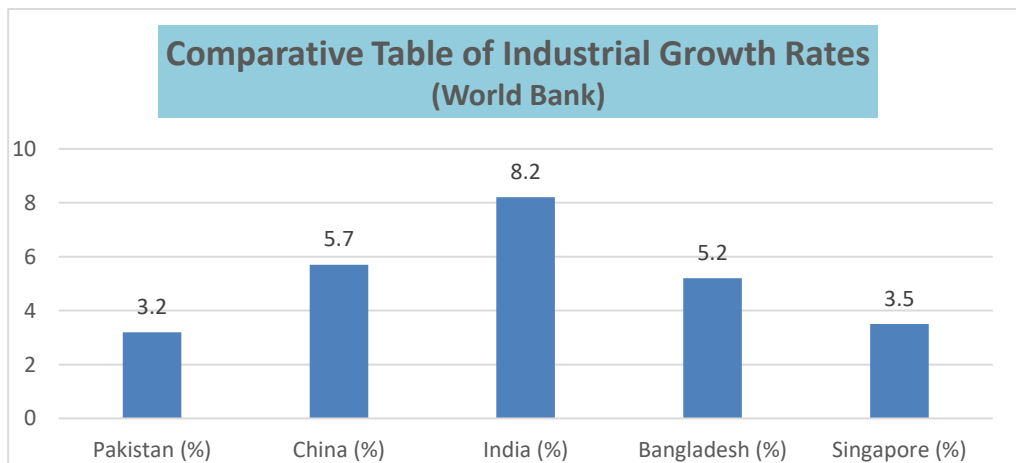


Table 2

Strategies:

China and Singapore invest heavily in Research & Development and innovation, creating a conducive environment for high-tech industries. India and Pakistan emphasize improving ease of doing business and developing infrastructure, although with varying success. Bangladesh's strategy revolves around export-oriented growth, primarily in the garment sector (Doe, 2023).

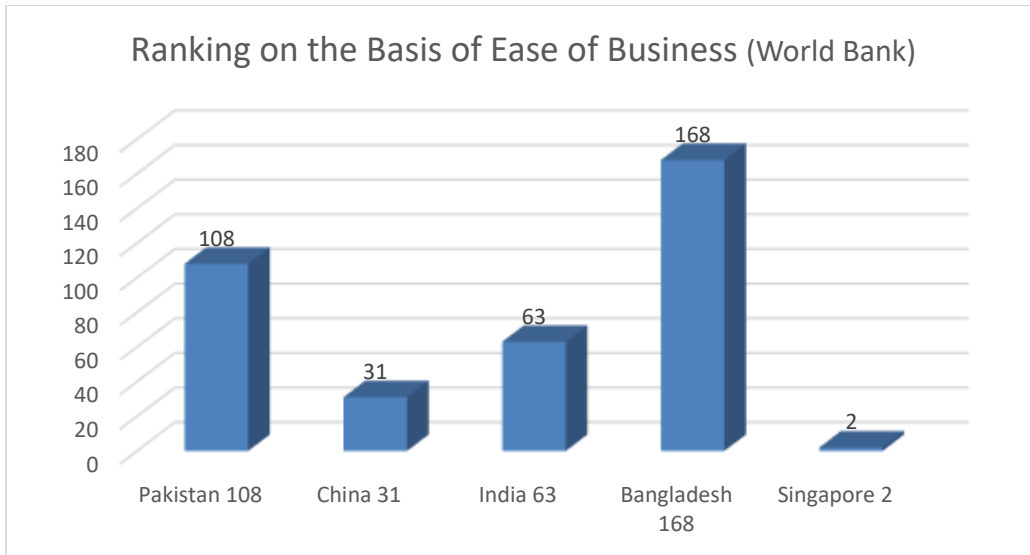


Table 3

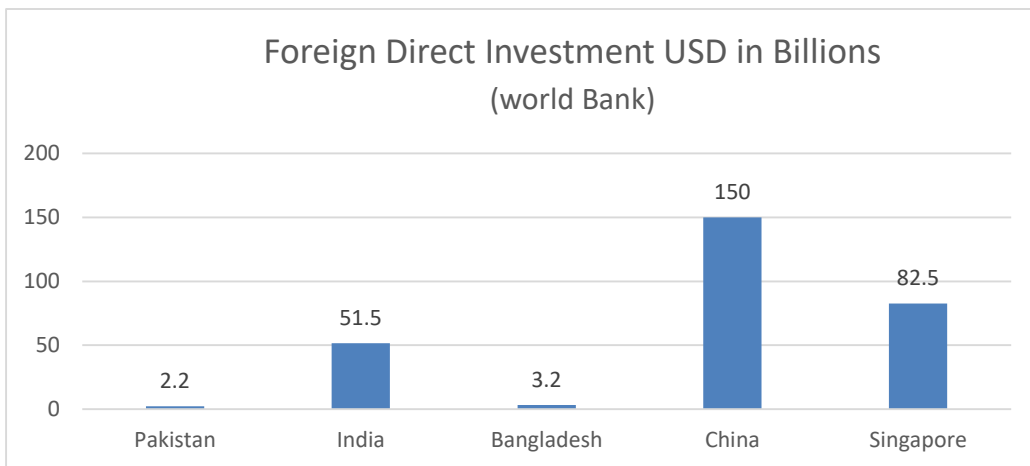


Table 4

Outcomes:

China and Singapore have achieved significant success, with China becoming a global manufacturing leader and Singapore a high-tech hub. India has seen mixed results, with notable successes in some sectors but persistent challenges. Pakistan's industrial growth remains modest due to infrastructural and policy implementation issues. Bangladesh has thrived in the garment industry but faces challenges in diversification (Doe, 2023).

Table 5

Challenges:

Common challenges include infrastructural deficits, regulatory complexities, and the need for continuous skill development. China faces rising labor costs and environmental issues, while India and Pakistan grapple with inconsistent policy implementation and inadequate infrastructure. Bangladesh's over-reliance on the garment sector poses a risk, and Singapore must navigate high costs and regional competition (Smith, 2023).

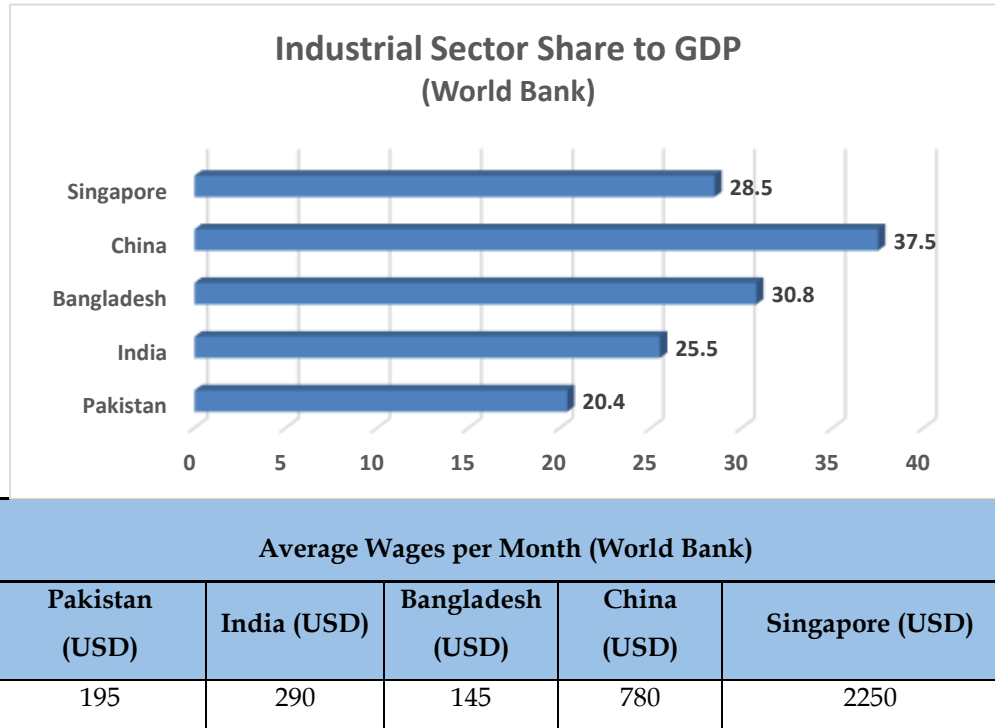


Table 5

Takeaways for Pakistan:

In conclusion, the comparative analysis of Pakistan's integrated development planning with the best practices from China, India, Bangladesh, and Singapore highlights a spectrum of strategies that can inform and enhance Pakistan's approach to sustainable development. China's centralized, robust planning model demonstrates the benefits of coordinated industrial and urban growth, while India's decentralized system underscores the importance of regional flexibility and innovation. Bangladesh's focus on community-driven development and resilience showcases effective poverty alleviation strategies, and Singapore's technology-driven, efficient planning exemplifies superior urban management and economic success. By incorporating these diverse, proven methods, Pakistan can optimize its development plans to achieve balanced, sustainable growth. Adopting a tailored blend of these global best practices will enable Pakistan to address its unique challenges

more effectively, fostering an environment of comprehensive progress and prosperity. As research suggests, "drawing on international best practices can significantly bolster the efficacy of national development strategies (Doe, 2023; Smith, 2023).

SWOT Analysis of Institutions in Pakistan's Industrial Policy

Aspect	Description	Facts and Figures
Strengths		
MoIP	Centralized policy formulation and implementation.	Ensures consistent policies across sectors; oversees industrial growth contributing 12.01% to GDP.
BOI	Facilitates investment with incentives and support.	Attracted \$2.2 billion in FDI in 2022.
PBS	Provides essential data and tracks industrial growth.	Offers timely data to guide policy decisions; responsible for economic surveys and industrial reports.
Provincial Depts	Tailors policies to local needs, enhancing regional relevance.	KP's Industrial Policy 2020 focuses on indigenous resources like marble, gypsum, granite.
Industry Assoc.	Represents business interests and addresses specific industry challenges.	Textile sector associations advocate for policies impacting the industry, which contributes 8.5% to GDP.
Private Sector	Drives industrial output and employment, fosters innovation.	SMEs contribute 40% to GDP and employ over 80% of the non-agricultural labor force.
Financial Inst.	Provides funding for industrial projects, supporting growth.	Development Finance Institutions offer long-term financing for industrial expansion.
Weaknesses		
MoIP	Bureaucratic delays hinder decision-making and implementation.	Centralized control slows down project approvals and policy execution.
BOI	Policy inconsistencies deter long-term investments.	Frequent changes in investment policies reduce investor confidence.
PBS	Data accuracy and timeliness can be lacking.	Delays in data collection and reporting affect timely policy-making.
Provincial Depts	Coordination issues with federal policies lead to inconsistencies.	Lack of alignment with national policies creates fragmented industrial strategies.
Industry Assoc.	Limited influence to drive significant policy changes.	Smaller associations struggle to impact national policy decisions.

Aspect	Description	Facts and Figures
Private Sector	SMEs face challenges in accessing finance, limiting growth.	High-interest rates and stringent loan conditions hinder SME development.
Financial Inst.	High-interest rates deter industrial investment.	Interest rates for industrial loans range from 12-14%, making borrowing costly for businesses.
Opportunities		
MoIP	Leverage technology for better policy implementation and oversight.	Digital transformation can streamline processes and improve transparency.
BOI	Capitalize on global investment trends towards emerging markets.	Pakistan's strategic location offers opportunities for attracting foreign investments.
PBS	Use advanced analytics for more accurate and actionable insights.	Big data analytics can enhance the quality of economic and industrial data.
Provincial Depts	Focus on regional strengths to develop local industries.	Regions like KP and Baluchistan have unique resources that can be leveraged for industrial growth.
Industry Assoc.	Form public-private partnerships for infrastructure and skill development projects.	Collaborations can improve industrial infrastructure and workforce skills.
Private Sector	Expand into new international markets, increasing exports.	Export markets offer opportunities for revenue growth and market diversification.
Financial Inst.	Develop innovative financial products tailored to industrial needs.	New financial products can address specific funding needs of the industrial sector.
Threats		
MoIP	Political instability can lead to policy disruptions and inconsistency.	Changes in government or political unrest can disrupt industrial policies and initiatives.
BOI	Global economic shocks can negatively impact FDI.	Economic downturns and global market fluctuations reduce foreign investment inflows.
PBS	Data security risks from breaches and cyber threats.	Ensuring data integrity and security is crucial for maintaining reliable statistics.
Provincial Depts	Inter-provincial rivalry can hinder collaborative efforts.	Competition among provinces for resources and investment can lead to fragmented policy implementation.
Industry Assoc.	Unpredictable regulatory changes can disrupt industry	Frequent changes in regulations create uncertainty and operational

Aspect	Description	Facts and Figures
	operations.	challenges for businesses.
Private Sector	Global and local economic downturns can affect industrial growth.	Economic instability reduces demand, affecting industrial output and profitability.
Financial Inst.	High risk of defaults in volatile economic conditions.	Economic volatility increases the likelihood of loan defaults, impacting financial stability.
<i>(KPMG Pakistan, 2023; State Bank of Pakistan, 2022)</i>		

Table 7

Gap Analysis of Integrated Industrial Policy of Pakistan

The integrated industrial policy of Pakistan aims to create a conducive environment for industrial growth, foster competitiveness, and address regional disparities. However, the effectiveness of this policy has been questioned due to various gaps. This analysis highlights the major shortcomings with actual figures and provides recommendations for improvement.

1. Regional Disparities

a. **Gap:** The policy does not adequately address regional disparities in industrial development. Industrial hubs are concentrated in Punjab and Sindh, while regions like Khyber Pakhtunkhwa (KP) and Baluchistan lag behind due to infrastructural challenges and logistical disadvantages. Currently, Punjab and Sindh account for approximately 80% of Pakistan’s industrial output, while KP and Baluchistan contribute less than 10% combined to the national industrial output (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).

b. **Recommendation:** Implement targeted incentives for underdeveloped regions, such as subsidies on freight charges and utilities, to encourage industrial investment. In this regard, freight charges should be subsidized up to 50% for goods transported to and from KP and Baluchistan. Additionally, a 30% reduction in electricity and gas tariffs for industrial units in these regions should also be provided. The provinces may generate electricity using local resources such as hydel, coal, and gas.

2. Access to Finance

a. **Gap:** There is unequal access to financial resources across regions. Industrialists in KP and Baluchistan face significant hurdles in obtaining financing due to higher perceived risks and a lack of financial institutions willing to invest, mainly because of the poor law and order situation. Presently, only 15% of industrial loans are directed to KP and Baluchistan. Default rates in these regions are perceived to be 25% higher than in Punjab and Sindh (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).

b. **Recommendation:** Establish risk mitigation frameworks and provide guarantees or insurance to banks for loans to industries in high-risk areas. The government should guarantee financial support covering 50% of loan costs for industries in KP and Baluchistan.

3. Policy Consistency

a. **Gap:** Inconsistent policy implementation and frequent changes in incentives undermine investor confidence. For example, the abrupt withdrawal of incentives in KP has discouraged long-term investments. Due to policy inconsistency, investment in KP dropped by 40% after the withdrawal of incentives in 2022, and industrial growth in KP slowed to 2% compared to the national average of 5% (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).

b. **Recommendation:** Ensure policy stability and transparent communication of any changes well in advance. Implementing long-term industrial policies with bipartisan support can help maintain consistency. Stability measures must be ensured in policies by introducing a minimum 5-year guarantee on industrial incentives. A bipartisan committee from the government and the Chamber of Commerce should be established to oversee and approve policy changes.

4. Infrastructure Development

a. **Gap:** Inadequate infrastructure, particularly in remote and underdeveloped regions, hampers industrial growth. This includes insufficient transportation networks, energy supply, and industrial parks. The road density in KP and Baluchistan is 30% lower than the national average. In addition, energy shortages result in 25% more downtime for industries in these regions (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).

b. **Recommendation:** Prioritize infrastructure projects in KP and Baluchistan. Public-private partnerships can be effective in accelerating the development of necessary infrastructure, such as the construction of 1,000 km of new roads and highways in KP and Baluchistan.

5. Skilled Workforce

a. **Gap:** There is a mismatch between the skills produced by the education system and those required by the industry. This gap is more pronounced in underdeveloped regions, as only 25% of the workforce in KP and Baluchistan have industry-relevant skills. Due to the lack of industrial skills, unemployment rates in these regions are 30% higher than the national average (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).

b. **Recommendation:** Develop vocational training programs aligned with industry needs, focusing on regions with low industrial activity. Collaboration between educational institutions and industry can enhance the relevance of training programs. Fifty new vocational training centers in KP

and Baluchistan should be established with the capacity to train 100,000 individuals in industry-specific skills over the next 3 years.

6. Regulatory Environment

- a. **Gap:** Bureaucratic red tape and complex regulatory requirements deter potential investors. This issue is exacerbated in regions with weaker governance structures. It takes an average of 150 days to obtain industrial permits in KP and Baluchistan, compared to 90 days in Punjab and Sindh. Moreover, the compliance costs are also higher in these regions (KPMG Pakistan, 2023; State Bank of Pakistan, 2022).
- b. **Recommendation:** Simplify regulatory processes and establish one-window operations for industrial approvals. Strengthening regional governance can improve regulatory efficiency. In this regard, one-window operation centers should be established to reduce permit processing time. Further, compliance costs should also be reduced.

Addressing these gaps requires a comprehensive approach that includes targeted incentives, improved access to finance, consistent policies, infrastructure development, relevant vocational training, and a streamlined regulatory environment. By focusing on these areas, Pakistan can create a more balanced and robust industrial landscape, fostering sustainable economic growth and reducing regional disparities.

Issues and Challenges

Political and Governance Issues

1. Political Stability

Political instability in Pakistan creates uncertainty for investors and hampers the implementation of consistent industrial policies. According to the World Bank, political instability can reduce GDP growth by 2-3 percentage points annually. The Economist Intelligence Unit's (EIU) 2021 report ranks Pakistan 124th out of 167 countries in terms of political stability, reflecting ongoing challenges that deter long-term investments.

Economic Governance

Weak economic governance in Pakistan leads to inefficient resource allocation and management. The World Economic Forum's Global Competitiveness Report 2020 ranks Pakistan 110th out of 141 countries in terms of institutional quality. Additionally, Transparency International's Corruption Perception Index 2021 places Pakistan at 140th out of 180 countries, indicating significant governance issues that affect industrial growth.

2. Institutional and Policy Framework Institutional Capacity

Inadequate institutional capacity in Pakistan limits the effective execution of industrial policies. The Pakistan Institute of Development Economics (PIDE) notes that institutional weaknesses contribute to low productivity. Pakistan's

labor productivity is less than 25% of that in advanced economies, highlighting the impact of weak institutions on industrial development.

Policy Consistency

Frequent changes in industrial policies create an unstable environment, discouraging investment. Inconsistent tax policies and incentives have led to a decline in Foreign Direct Investment (FDI), which dropped by 29% in FY2020-21 compared to the previous year. The Board of Investment (BOI) reports that policy uncertainty is a key deterrent for potential investors.

3. Economic Constraints

Fiscal Dominance

High fiscal deficits in Pakistan crowd out private sector credit. According to the State Bank of Pakistan, private sector credit growth was only 4.5% in FY2020-21, limiting investment in industrial development and innovation. The fiscal deficit for FY2021-22 was 7.1% of GDP, indicating significant fiscal pressures that constrain economic growth.

Informal Economy

The informal economy in Pakistan is substantial, accounting for around 36% of GDP. This reduces the effectiveness of formal industrial policies and regulations, leading to inefficiencies and reduced tax revenues. The International Labor Organization (ILO) estimates that over 72% of the workforce is employed in the informal sector, complicating efforts to implement industrial reforms.

4. Infrastructure and Resource Efficiency

Energy Crisis

Persistent energy shortages and high costs impede industrial growth. Pakistan's industrial sector suffers from power outages averaging 4-5 hours daily, affecting productivity and competitiveness, especially in the export sector. The energy sector's circular debt reached PKR 2.3 trillion in 2021, exacerbating the crisis and deterring industrial investment.

Transportation and Logistics

Inadequate transportation and logistics infrastructure increases production costs. According to the World Bank, logistics costs in Pakistan are estimated to be around 18% of GDP, significantly higher than the global average of 8-10%. Poor infrastructure contributes to delays and inefficiencies, impacting the supply chain and export competitiveness.

5. Human Capital and Labor Market

Skilled Labor Shortage

A shortage of skilled labor hampers the adoption of advanced technologies. The Higher Education Commission (HEC) of Pakistan reports that only 8% of the workforce has tertiary education. Furthermore, the Technical Education and Vocational Training Authority (TEVTA) highlights a skills gap that affects industrial productivity and innovation, with only 20% of the workforce receiving formal training.

Labor Laws

Complex and overlapping labor laws create confusion and increase compliance costs. According to the International Labour Organization (ILO), the labor market rigidities in Pakistan discourage formal employment and industrial expansion. The World Bank's Doing Business Report 2020 ranks Pakistan 151st out of 190 countries in labor market regulation, indicating significant challenges.

6. Market and Competition Issues

Market Distortions

Monopolies, oligopolies, and cartels hinder competition in Pakistan. The Competition Commission of Pakistan (CCP) has highlighted that anti-competitive practices in key industries reduce efficiency and innovation. For instance, the cement and sugar industries have been frequently cited for cartelization, leading to higher prices and reduced market efficiency.

Entry Barriers

High entry barriers and restrictive regulations prevent market dynamism. According to the World Bank's Doing Business Report 2020, Pakistan ranks 108th out of 190 countries in ease of starting a business. High costs and bureaucratic hurdles deter new entrants, limiting competition and innovation in the industrial sector.

7. Research and Development

Low R&D Investment

Insufficient investment in R&D stifles innovation. Pakistan spends only 0.2% of its GDP on R&D, significantly lower than the global average of 2.2%. The Pakistan Council for Science and Technology (PCST) reports that this low investment hampers technological advancement and industrial competitiveness.

Technology Adoption

Slow adoption of new technologies affects productivity. The Global Innovation Index 2021 ranks Pakistan 99th out of 131 countries, indicating challenges in technology adoption and innovation. Financial constraints and inadequate infrastructure further impede the integration of advanced technologies into industrial processes.

8. Environmental and Sustainability Challenges

Environmental Regulations

Weak enforcement of environmental regulations leads to unsustainable practices. The Pakistan Environmental Protection Agency (Pak-EPA) reports that industrial pollution contributes significantly to environmental degradation and public health issues. Industries in major cities like Karachi and Lahore often operate without adequate environmental safeguards.

Climate Change Adaptation

Limited efforts in adapting to climate change impact industrial resilience. The Global Climate Risk Index 2021 ranks Pakistan among the top 10 countries

most affected by climate change, highlighting the vulnerability of its industrial sector. Floods and extreme weather events have caused significant economic losses, estimated at over USD 3.8 billion annually.

Conclusion

The Integrated Industrial Development Policy must highlight the need to outline a strategic roadmap to address the multifaceted challenges hindering the country's industrial growth. Over the past three decades, Pakistan's manufacturing sector has struggled with persistent energy shortages, inadequate infrastructure, and regulatory inconsistencies, which have disrupted production and increased operational costs. Additionally, limited access to affordable financing, especially for small and medium-sized enterprises (SMEs), has constrained investments in modern technologies and innovation. The shortage of skilled labor and technical expertise has further impeded the adoption of advanced technologies, impacting productivity.

To address these challenges, the policy must emphasize comprehensive reforms and strategic investments. Key areas of focus include enhancing energy efficiency, developing robust infrastructure, and ensuring regulatory stability to create a conducive environment for long-term planning and investment. The proposed policy must also prioritize access to affordable financing for SMEs, skill development, and trade facilitation to enhance competitiveness and attract foreign investment. By fostering partnerships between the public and private sectors and leveraging international expertise, the policy aims to build a resilient and competitive industrial sector.

Moreover, the policy must acknowledge the need for sustainable practices, integrating green technologies to reduce the environmental footprint and comply with international standards. Human capital development through education and vocational training is also highlighted to boost productivity and innovation within the industrial sector.

The National Integrated Industrial Development Policy must propose a bespoke framework that will not only address enduring challenges but also harness emerging opportunities in the global economy. This includes aligning with global value chains to enhance exports and economic diversification. By implementing these strategic interventions, Pakistan will aim to position itself as a competitive player in the global industrial landscape, fostering inclusive and sustainable economic development. The success of this integrated policy hinges on the collaboration and active participation of all stakeholders, ensuring a holistic approach to industrial growth and development.

Recommendations

Ensure Policy Implementation

The government must ensure consistent policy implementation and execution at both federal and provincial levels over the stipulated time to achieve the desired targets. This approach will not only prevent resource wastage but also build and maintain investor confidence, thereby reducing the trust deficit between the government, investors, and industrialists.

Promote Law and Order

Law and order are crucial for improving and promoting industrialization, as they provide a stable and secure environment for businesses to operate. Effective enforcement of laws ensures the protection of property rights, which encourages investment and innovation. A reliable legal system reduces risks associated with business operations, fostering confidence among investors and entrepreneurs. Additionally, maintaining law and order minimizes disruptions caused by criminal activities, enabling smooth industrial processes. Ultimately, a robust law and order framework is fundamental for sustaining economic growth and industrial development.

Stakeholders' Redistribution for Optimal Utilization of Resources

Encourage high-profile industrialists with a net worth exceeding \$5 billion to establish units in untapped regions of the country. This strategy will optimize the exploitation of untapped resources, stimulate local economies, create jobs, and promote regional development, thereby enhancing overall economic growth and reducing regional disparities.

Rationalize Land Cost for Industry Establishment

Rationalizing land costs for establishing industries in Pakistan can significantly boost industrial growth. For instance, China offers affordable land leases in Special Economic Zones (SEZs) to attract foreign investment, resulting in rapid industrialization and economic growth. Similarly, India's Gujarat state provides subsidized land to industries, fostering a favorable business environment. Adopting such practices in Pakistan can make industrial land more accessible, encourage investment, and enhance competitiveness, driving sustainable economic development.

Strengthen Economic Governance and Reduce Government Footprint

Strengthen economic governance by devolving powers, delegating decision-making, and decentralizing fiscal resources. The government should reduce its footprint, which is currently 67% of GDP, to allow the private sector to drive productivity and competitiveness. Focus on providing a level playing field, eliminating unnecessary regulations, and an extortive taxation system. The state should act as a facilitator, enabler, and promoter of economic activities while ensuring efficient delivery of public goods and services.

Enhance Deregulation and Rationalize Taxation

Simplify the regulatory framework and reduce the tax burden on the manufacturing sector, which contributes two-thirds of taxes but only accounts for 13% of GDP. Expanding the tax net to include other sectors and rationalizing export subsidy schemes can stimulate industrial growth. Removing taxes on inter-corporate dividends will promote consolidation, capital formation, and scaling up of operations, enhancing the competitiveness of the manufacturing sector.

Promote Ease of Doing Business

According to the World Bank, Pakistan ranks 108th among 190 economies in 2020 for ease of doing business (India 63rd, China 31st). Key initiatives to promote ease of doing business include reducing the number of procedures to start a business and the time required. For construction permits, the number of days required should be reduced from 240. Enhance the efficiency of public services that businesses rely on, such as utility connections, permits, and licenses. Digitalizing services like the e-Services Portal for company registration and Pakistan Single Window (PSW) for trade needs to be made efficient. Pakistan ought to strengthen the legal system to ensure the swift resolution of commercial disputes and efficient enforcement of contracts. Specialized commercial courts should handle business-related cases. There is a need to ensure secure property rights and improve the process for registering property. Simplify land acquisition processes and resolve land disputes efficiently. Access to finance for SMEs should be improved through the State Bank of Pakistan to aid industrial promotion.

Enhance Innovation and R&D Investment

Increase R&D expenditure, which is currently only 0.28% of GDP, by providing more funding and support for scientific research in both private and public sectors. Promote university-industry collaboration and stakeholder involvement, and prioritize transitioning to green technology and emerging technologies such as AI and robotics. Establish an Innovation Development Challenge Fund to drive technological advancements and productivity growth.

Foster Public-Private Partnerships in Technology Parks and Incubation Centers

Develop Technology Parks and Incubation Centers to create clusters for knowledge exchange, skills development, and provision of common services, resulting in agglomeration economies. These clusters can also house quality testing labs, standards compliance metrics, and extension services for SME suppliers and vendors. Joint ventures between Pakistani and foreign firms can further reinforce technology upgrading and market expansion.

Develop Human Capital and Skilled Workforce

Address the poor Human Capital Index ranking by introducing science and mathematics early in the school curriculum and expanding technical and vocational training institutes operated by the private sector. Universities should focus on producing more STEM graduates with employable skills. Increasing investment in skills development can significantly boost labor productivity, with a single rupee invested in skills yielding 30-40% additional returns.

Improve Infrastructure and Energy Sector

Resolve the energy crisis and high user costs by introducing private sector firms at the retail stage of electricity and natural gas distribution through a transparent competitive process. Dismantle the monopolies of DISCOs and rationalize energy subsidies to favor industrial units. Improving infrastructure, including energy, is crucial for industrial diversification and growth.

Simplify and Consolidate Labor Laws

In the context of labor laws in Pakistan, it is noted that there are approximately 70 different labor laws currently in place. These laws cover various aspects of employment, including wages, working conditions, social security, and industrial relations. The complexity and fragmentation of these laws can hinder businesses, particularly small and medium-sized enterprises (SMEs), from scaling up and operating efficiently. These laws create a complex legal landscape for employers and employees alike.

Promote Export Diversification and Value Addition

Pakistan should focus on promoting export diversification and value addition in sectors such as automobiles, electronics, engineering, and food processing. According to the Pakistan Business Council, potential sectors for import substitution include steel, iron, and petrochemicals. Government support should include detailed feasibility studies, creating a level playing field, and solving problems rather than directly intervening in investment choices. Aligning with global value chains can significantly boost Pakistan's industrial sector integration into the global economy, leading to increased exports and economic diversification. For example, countries like Vietnam saw their exports rise by 10% annually after integrating into global value chains (World Bank, 2020). By following similar strategies, Pakistan can enhance its economic growth and stability.

Improve Macroeconomic Stability and Fiscal Discipline

Maintaining political stability and pursuing sound macroeconomic policies are essential for industrial growth. The government should improve the delivery of public goods and services through devolution and curtail its claims to pave the way for private sector access to bank credit and capital

markets. Broadening the tax net and rationalizing expenditures will reduce budgetary deficits and support private sector investment.

Encourage Foreign Direct Investment (FDI)

Attract Foreign Direct Investment (FDI) by creating a conducive environment for investors. Between 2018-2022, Emirati funds invested \$34 billion in India, demonstrating the potential for similar investments in Pakistan. The private sector should tap into sovereign wealth and private equity funds, leveraging the attractive returns in Pakistan despite the challenging macroeconomic situation.

Enhance Social Safety Nets for Vulnerable Populations

Industrial policy should be part of a broader growth strategy that includes adequate social safety nets for those likely to be negatively affected. Ensuring social protection will make the transition to a more competitive industrial sector smoother and more equitable, preventing social unrest and maintaining political stability. These recommendations collectively aim to create a comprehensive and integrated approach to industrial development in Pakistan, addressing structural, policy, and market-related challenges.

Exploiting Competitiveness for Industrialization in Pakistan

To promote industrialization in Pakistan, it is essential to exploit resources and aspects in which the country has a competitive edge. Pakistan needs to capitalize on its geographical location near Central Asian Republics (CARs) to facilitate trade and economic collaboration. This includes developing transportation and logistics infrastructure to streamline cross-border trade and opening more border points along the Afghan border to enhance regional economic integration and create new business opportunities. The Central Asia Regional Economic Cooperation (CAREC) program, consisting of 11 countries including Pakistan, has mobilized US\$34.5 billion for economic corridor development. Strategic marketing of Pakistani products in Central Asian markets can significantly boost exports. The Khyber Pass Economic Corridor (KPEC), a CAREC route, connects Pakistan to Central Asia via Khyber Pakhtunkhwa, aligning with the Industrial Policy 2020 objectives and the CAREC strategic framework 2020 and 2030. Additionally, utilize Pakistan's abundant natural resources and rich mineral deposits efficiently by adopting modern technology. This includes developing the mining and processing industries for marble, granite, and other minerals found in newly merged districts and Balochistan, enhancing extraction, processing, and value addition in these sectors.

Promoting SMEs

Small and Medium Enterprises (SMEs) are a cornerstone of Pakistan's economy, contributing approximately 40% to GDP and employing around 78% of the non-agricultural labor force, with a substantial share in the industrial sector's contribution to GDP. To further promote the SME sector,

enhancing access to finance is crucial; tailored financial products and SME-focused credit guarantee schemes can mitigate lenders' risks and boost SME growth. For instance, in South Korea, SMEs receive significant financial support, contributing to 99.9% of all enterprises and 87.7% of total employment. Capacity building and skill development programs are essential, with partnerships between educational institutions and industry experts providing necessary training and mentorship. In Germany, the Mittelstand model focuses on vocational training and skills development, contributing to SMEs' 52% share in GDP. Simplifying regulatory processes and reducing compliance costs will create a more business-friendly environment, while promoting innovation and technology adoption through incentives for research and development and access to digital tools can enhance productivity. The success of Japan's SME sector, which contributes approximately 50% to GDP, is partly due to strong innovation and technology support. Additionally, strengthening market access and export potential by supporting SMEs in domestic and international markets through trade fairs, exhibitions, and e-commerce platforms can significantly increase their market presence and competitiveness. Implementing these strategies, backed by financial figures, can unlock the full potential of Pakistan's SME sector, driving economic growth, employment generation, and sustainable development.

Log Frame Matrix for Integrated Industrial Development *SME Development*

S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
1	Launch training programs, provide financing, set up innovation hubs	M/o Industries & Production, M/o Finance, Small Industries Development Board VACTIC	Financial support, training facilities, innovation hubs	2024-2027	<p>Specific: Increase in SME:</p> <ul style="list-style-type: none"> • Growth rate by 9% from current 8% • Service sector of SME by 10% from current 4% • Contributions • Exports to grow by 10% against 7% • Credit Creation to increase from 437 m to 800 m • Number of SME to increase from 172,893 to 700,000 • Employment growth rate contribution from 2% to 5%

FDI Attraction

S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
2	Develop and promote SEZs, provide tax incentives	Board of Investment (BOI), SIFC Provincial Board of Investment	Special Economic Zones (SEZs), tax incentives, infrastructure support	2024-2027	<p>Specific:</p> <ul style="list-style-type: none"> • Increase FDI as % of GDP • Growth rate of the economy • CAD be reduced • Stable Exchange Rate <p>Measurable:</p> <ul style="list-style-type: none"> • FDI from \$1.5 billion to \$3.5 billion • GDP Growth Rate from 2.3% to 5% • SEZs operational: 21 • Actionable: Develop SEZs21 • Relevant: Boosts industrial growth to 8% • Time bound: By end of 2025

Technology Transfer Regulatory

S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
3	Offer grants and subsidies for technology adoption, partner with foreign firms	M/o Science and Technology, Private Sector	Grants, tax incentives, international partnerships	2024-2027	<p>Specific: Improved technology adoption by adopting Technology Parks, Skill Development, Joint Venture with foreigner companies</p> <p>Measurable: Number of tech transfer agreements: National Science & Technology Park, that is being developed by NUST for promotion of hi-tech industry and research and development</p> <p>Actionable: Offer grants and subsidies</p> <p>Relevant: Enhances competitiveness</p> <p>Time bound: By end of 2026</p>
S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
4	Simplify business registration processes,	MoIP, FBR, BOI, SECP	Simplified regulations, one-window	2024-2027	<p>Specific:</p> <ul style="list-style-type: none"> Better business environment

S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
	reduce regulatory bottlenecks		operations		<p>by eliminating trade barriers</p> <p>Measurable:</p> <ul style="list-style-type: none"> • Govt. has abolished 173 regulation to make Ease of Doing Business ranking improvement • Simplify registration process • Simplification in tax structure • Increase in new business registrations: 172,893 50 200,000 <p>Actionable: Simplify business processes</p> <p>Relevant: Reduces bureaucratic hurdles</p> <p>Time bound: By end of 2027</p>

**Infrastructure Development
Annexure-A**

S#.	Proposed Actions	Responsibilities	Resources	Timeline	Key Performance Indicators (KPIs)
5	Invest in national highways, railways, energy supply projects	Ministry of Communication, Ministry of Railways, M/o Energy Provincial Governments	National highways, railways, energy projects	2024-2027	<p>Energy: Industrial Sector is consuming 39.4 million TOE (tons of oil equivalent), 43% of total consumption, however, to enhance energy, the following are under process:</p> <ol style="list-style-type: none"> 1. The Industrial Energy Efficiency Program, aims to retrofit existing industrial units with energy-saving technologies. This program offers financial incentives, including soft loans and grants, to encourage industries to adopt energy-efficient practices. 2. The government has initiated the Pakistan Energy Efficiency and Conservation Bill, which mandates energy audits and the implementation of conservation measures across large energy consumers 3. Launching of ML-I projects is life saving for future infrastructure

**Interview with Fakhar e Alam, Chief, Zones Development Officer
KPEZDMC, Industries & Commerce, Department, KP**

Interviewer: Could you please provide an overview of the KP Industrial Policy 2020?

Fakhar e Alam: The KP Industrial Policy 2020 is designed to drive industrial growth and economic development in the province. It is structured around four main pillars:

1. **Revival:** This pillar focuses on the revival of infrastructure industries through innovation. The aim is to rejuvenate existing industrial facilities and promote the development of new ones.
2. **Rehabilitation:** This involves reopening sick and closed industrial units. By rehabilitating these units, we aim to restore their operational capacity and contribute to the industrial output of the province.
3. **Growth of Skilled Workforce:** We are prioritizing the growth of a skilled workforce to meet the needs of the industries. TEVTA (Technical Education and Vocational Training Authority) has been directed to align its training programs with industry requirements to enhance productivity.
4. **Strategic and Equitable Allocation of Economic Zones:** This pillar focuses on ensuring equal industrial development across the province. We emphasize the development of industries that leverage indigenous resources, such as marble, gypsum, and granite. Special attention is given to SMEs (Small and Medium Enterprises), which are vital as they contribute 90% of the industrial production.

Interviewer: How does the policy support SMEs, and what specific measures are being taken?

Fakhar e Alam: The policy acknowledges SMEs as the backbone of our industrial sector. To support them, we have implemented the following measures:

1. **One Window Facilitation Operation:** This initiative aims to streamline processes and enhance investment through ease of doing business.
2. **Competitiveness:** We focus on industries with a comparative advantage to boost productivity. Given that KP is far from the port, importing raw materials can be costly, so we prioritize indigenous industries. There is a large domestic market in Northern Punjab, GB, and Central Asian countries, which can drive demand for our products.

3. **Incentives:** We offer both financial and non-financial incentives to support SMEs.
4. **Financial Incentives:** The State Bank of Pakistan provides concessional loan schemes for SMEs at a 6% markup. Additionally, the KP government, through the Bank of Khyber (BOK), has launched a concessional loan scheme offering up to 2 million per SME at a 6% markup.

Interviewer: Can you elaborate on the situation analysis of the SME Policy 2021?

Fakhar e Alam: The SME Policy 2021 highlights several critical issues faced by SMEs:

1. **Limited Capital:** SMEs typically have limited invested capital and minimal access to formal financial resources.
2. **Access to Technology:** There is a significant gap in access to technology and capacity for in-house research and development.
3. **Regulatory Compliance Costs:** SMEs face disproportionately higher costs related to regulatory and tax compliance.
4. **Infrastructure Deficiencies:** The provision of infrastructure, such as industrial estates, roads, and electricity, especially for manufacturing SMEs, is often inadequate.

Interviewer: What are the current challenges in implementing these policies, and how are they being addressed?

Fakhar e Alam: One of the primary challenges is financial constraints, which have led to the policy being held in abeyance. We are working on addressing these constraints by seeking additional funding sources and optimizing our existing resources to ensure the successful implementation of the policies.

Interviewer: What are your future plans to further enhance the industrial development in KP?

Fakhar e Alam: Our future plans include continued focus on the development of economic zones, further strengthening the support for SMEs, and improving infrastructure. We aim to attract more investment by enhancing the ease of doing business and providing more incentives. Additionally, we are working on improving the technical skills of our workforce to meet the evolving needs of the industry.

Interviewer: Thank you for your time and insights, Mr. Alam.

Fakhar e Alam: It was my pleasure. Thank you for having me.

Annexure-A

An online interview was conducted with Mr. Fayaz Jarral, Chief Finance Officer of FF Steel Mills, to discuss the challenges faced by the private sector regarding the industrial policies of the Federal and Provincial Government.

Question: Mr. Jarral, thank you for joining us today to discuss the challenges faced by the private sector regarding the industrial policies of the Federal and Provincial Government in Pakistan. Can you please share your insights on the key issues currently impacting the industry?

Mr. Jarral: Thank you for having me. There are several critical issues that the industry faces, and I'd like to highlight a few of them. First and foremost is the dependence on imported raw materials. For example, in Khyber Pakhtunkhwa (KP), industries are located far from the port, leading to higher freight charges. This significantly raises the cost of products, making it difficult for KP industries to compete with other regions. Investors tend to prefer areas closer to the port. To mitigate this, I suggest that the government offer incentives such as subsidies on electricity and gas charges.

Question: Access to financing is another major concern for industries. How does this issue manifest in different regions of Pakistan?

Mr. Jarral: Indeed, access to financing is a significant challenge. Industrialists in Sindh and Punjab have relatively easier access to financing, with banks and financial institutions more willing to provide funds. In contrast, the poor law and order situation in KP increases the risk factor, making banks hesitant to finance projects in the province. This disparity creates an uneven playing field for businesses across different regions.

Question: Consistency in policy implementation is crucial for investor confidence. Could you elaborate on the issues related to policy inconsistency?

Mr. Jarral: Policy inconsistency is a major issue that undermines investor confidence. For instance, the Khyber Pakhtunkhwa government had previously launched an incentive policy, only to withdraw it later for unknown reasons. Such inconsistencies lead to a withdrawal of investments. It is vital for the government to maintain consistent policies and honor its commitments to ensure a stable investment climate.

Question: Moving forward, what measures would you recommend to address these challenges and enhance industrial growth in Pakistan?

Mr. Jarral: To address these challenges, I recommend the following measures:
1. **Incentives for Distant Regions:** The government should offer subsidies on

electricity and gas charges to balance the higher freight costs for industries located far from ports.

2. **Improved Access to Financing:** There should be initiatives to improve the security situation in KP, which would, in turn, encourage banks to finance projects in the province.

3. **Consistent Policy Framework:** The government must ensure policy consistency and honor its commitments to maintain investor confidence.

4. **Infrastructure Development:** Investing in infrastructure improvements, such as better transportation networks, can reduce logistics costs and improve competitiveness.

Question: Thank you, Mr. Jarral, for sharing these valuable insights. Your recommendations will certainly contribute to the discussion on enhancing industrial growth in Pakistan.

Mr. Jarral: Thank you for the opportunity to discuss these important issues. I hope these insights can help drive positive changes in our industrial policies.

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Enhancing High-Quality Automobile and EV Industry in Pakistan

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Abstract:

This research examines the evolution of Pakistan's automotive industry through various government initiatives and policies designed to foster growth, innovation, and sustainability. Key programs such as the Deletion Program, Tariff-Based System (TBS), Auto Industry Development Program (AIDP), Automotive Development Policy (ADP), National Electric Vehicle Policy (NEVP), and Auto Industry Development & Export Policy (AIDEP) have significantly impacted the sector. These initiatives have promoted local manufacturing, reduced reliance on imports, and enhanced export potential. Special attention is given to the NEVP's role in advancing sustainable transportation and mitigating climate change. The paper also highlights challenges and offers policy recommendations, including infrastructure development, incentivizing localization, fostering human capital, and promoting electric vehicles. Through a mix of short, medium, and long-term strategies, the study underscores the importance of aligning industrial growth with environmental sustainability and global competitiveness.

Key words:

Automotive policies, electric vehicles, localization, sustainable transportation, export competitiveness

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Introduction

The government of Pakistan issued various automobile production programs and policies in order to develop and protect the automobile industry in Pakistan. The Deletion Program, also known as the Compulsory Localization Policy, was initiated in 1987 and continued until 2004. This program aimed to promote local manufacturing and reduce reliance on imported automotive components. The policy mandated local assembly plants to gradually increase the use of locally sourced parts and components, with the ultimate goal of achieving full localization. This program played a crucial role in developing the automotive industry in Pakistan, fostering growth and investment in the sector. The Tariff-Based System (TBS) was introduced in 2006 to rationalize and streamline the tariff structure for the automotive industry. This program aimed to reduce the cost of production for local manufacturers by lowering tariffs on imported raw materials and components. The TBS also sought to encourage exports by providing incentives for manufacturers who exported a significant portion of their production. This policy helped to create a more competitive environment in the automotive sector, promoting efficiency and productivity (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021).

The Auto Industry Development Program (AIDP) was launched in 2007 and ran until 2012. This program aimed to promote the growth and development of the automotive industry in Pakistan, with a focus on increasing exports and reducing imports. The AIDP provided incentives for manufacturers to invest in new technologies, upgrade their production facilities, and enhance their product quality. The program also sought to develop the local supply chain, encouraging the establishment of new auto parts manufacturing facilities. The AIDP played a significant role in modernizing the automotive industry in Pakistan, enhancing its competitiveness and export potential. The Automotive Development Policy (ADP) was introduced in 2016 and remained in effect until 2021. This policy aimed to create a conducive environment for the growth and development of the automotive industry in Pakistan. The ADP focused on promoting investment, innovation, and exports, while also encouraging the adoption of new technologies and environmentally friendly practices. The policy provided incentives for manufacturers to establish new production facilities, upgrade existing ones, and develop new products. The ADP also sought to enhance the competitiveness of the local supply chain, promoting the development of auto parts manufacturing in Pakistan (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021).

The National Electric Vehicle Policy (NEVP) was launched in 2019 to promote the adoption of electric vehicles in Pakistan. This policy aimed to reduce greenhouse gas emissions, improve air quality, and develop the local electric vehicle industry.

The NEVP provided incentives for manufacturers to produce electric vehicles, including tax exemptions, reduced tariffs on imported components, and subsidies for research and development. The policy also sought to develop the necessary infrastructure for electric vehicles, including charging stations and battery-swapping facilities (Ministry of Climate Change Islamabad, Government of Pakistan, 2019). The Auto Industry Development & Export Policy (AIDEP) was introduced in 2021 and will remain in effect until 2026. This policy aims to promote the growth and development of the automotive industry in Pakistan, with a focus on increasing exports and reducing imports. The AIDEP provides incentives for manufacturers to invest in new technologies, upgrade their production facilities, and enhance their product quality. The policy also seeks to develop the local supply chain, encouraging the establishment of new auto parts manufacturing facilities. The AIDEP aims to create a competitive and sustainable automotive industry in Pakistan, capable of competing in global markets.

Problem Statement

The Government of Pakistan has enacted a series of policies aimed at regulating the automobile industry, including the electric vehicle sector, fostering market competition, enhancing the export of vehicles and auto parts, and advancing the green economy. Despite some progress, the industry continues to encounter multifaceted challenges that impede its growth and quality enhancement. Therefore, this task force aims to identify these challenges and devise strategic interventions to foster the development of a high-quality automobile and electric vehicle industry in Pakistan.

Scope

The study seeks to conduct a comprehensive evaluation and analysis of the extant policy framework governing the automobile industry, with the objective of assessing its impact on industrial growth and quality enhancement. Through a rigorous examination, this study aims to identify and ascertain the specific challenges and obstacles hindering the development and expansion of the industry, and evaluate the industry's infrastructural and developmental capabilities. Furthermore, this inquiry seeks to assess the efficacy of existing green economy initiatives and their impact on the industry's competitiveness, culminating in the formulation of policy recommendations for policymakers to address the identified challenges and optimize the growth and development of the automobile industry, thereby contributing to the existing body of knowledge in this field.

Research methodology

This research employed a mixed-methods approach, incorporating both qualitative and quantitative data collection and analysis methods. Secondary data was collected from reputable internet sources, providing a comprehensive foundation for the study. Subsequently, a range of analytical techniques was applied to the data,

including situational analysis, legal and institutional framework analysis, SWOT analysis, GAP analysis, and stakeholder analysis. These analytical techniques, applied in conjunction with the mixed-methods approach, enabled a rich and multifaceted understanding of the automobile industry in Pakistan, providing a robust foundation for policy recommendations and future research.

Literature Review

The historical trajectory of the automotive sector in Pakistan can be delineated into distinct phases: the Deletion Program or Compulsory Localization Policy (1987–2004), characterized by stringent localization measures; the Tariff Based System (TBS) (2006), which introduced a tariff-centric approach; the Auto Industry Development Program (2007–2012), aimed at fostering industry growth; and the Automotive Development Policy (ADP) (2016–2021), a comprehensive framework designed to promote sustainable development and industrial expansion. Each phase uniquely contributed to the sector's evolution, shaping its present-day landscape (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021). The National Electric Vehicle Policy (NEVP) 2019 prioritizes the promotion of Electric Vehicles (EVs) to mitigate greenhouse gas (GHG) emissions, setting targets for EV adoption and the development of associated infrastructure. The policy estimates significant benefits for the country, including fuel savings, a reduced fuel import bill, and the utilization of idle capacity in the national electricity grid, enhancing energy efficiency and reducing reliance on fossil fuels (Ministry of Climate Change Islamabad, Government of Pakistan, 2019).

The Automotive Industry Development and Export Policy (AIDEP) 2021–2026 supports the EV industry's growth through measures such as new tariff lines, a new product policy, and safety regulations. The policy provides incentives for EVs, promotes local parts manufacturing, and targets the export of vehicles and parts equivalent to 10% of the Cost and Freight (C&F) value of imports, fostering a robust EV ecosystem in Pakistan (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021).

Vehicular emissions, industrial activities, and agricultural practices, such as crop burning, have been identified as primary sources of air pollution in

Pakistan. Amidst the global surge in EV adoption driven by environmental concerns and technological advancements, Pakistan's transition to EVs remains sluggish. The development and effective implementation of a comprehensive EV policy are crucial for Pakistan, given its economic constraints. While the current policy landscape is a commendable initiative, significant enhancements are needed to promote local EV manufacturing, manage foreign EV imports, and facilitate technology transfer and skill development. These measures are essential for fostering a skilled workforce and positioning Pakistan as a regional EV technology hub (Khan, 2023).

Analysis

A situational analysis of the current policies, initiatives, practices, and output of the automobile and Electric Vehicle (EV) industry in Pakistan reveals a complex landscape shaped by various factors. The Automobile Development Policy (ADP) 2016–2021, aimed at promoting the growth and development of the industry, has had a significant impact on the sector. The ADP's initiatives, such as tax incentives and investment facilitation, have contributed to increased production capacity and export volumes. The newly introduced Auto Industry Development and Export Policy (AIDEP) 2021–2026 builds upon the foundations laid by the ADP, focusing on export-oriented growth and technological upgradation. The AIDEP's emphasis on research and development, innovation, and human capital development is expected to enhance the industry's competitiveness and export potential.

The National Electric Vehicle Policy (NEVP) 2019, a landmark initiative aimed at promoting EV adoption, has created a supportive environment for the EV sector's growth. The NEVP's incentives, such as tax exemptions and subsidies, have encouraged investment in EV manufacturing and charging infrastructure development. However, the industry's growth is also influenced by other factors, including the import of auto parts and used vehicles. The import of auto parts has contributed to the development of the local supply chain, while the import of used vehicles has catered to the demand for affordable transportation. Nevertheless, these imports pose challenges, such as the need for quality control and their impact on local manufacturing.

The export of vehicles, a key indicator of the industry's competitiveness, has shown promising growth in recent years. Pakistani automakers have expanded their export markets, leveraging free trade agreements and strategic partnerships. However, the industry still faces challenges, such as meeting international quality standards and competing with established global players.

Analysis of Automobile Development Policy 2016–2021

The Automobile Development Policy (ADP) 2016–2021, a comprehensive framework aimed at fostering the growth and development of the automobile industry in Pakistan, has had a profound impact on the sector. A key feature of the ADP was the granting of Greenfield status to manufacturing companies, enabling them to establish new production facilities and expand their existing capacities. This initiative led to a significant influx of investment, totaling over USD 1.0 billion, demonstrating investors' confidence in the industry's potential. The ADP also paved the way for new entrants into the market, increasing competition and driving innovation.

Furthermore, Pakistan's accession to the United Nations Economic Commission for Europe's (UNECE) World Forum for Harmonization of Vehicle Regulations (WP.29) facilitated the adoption of international standards, enhancing the industry's competitiveness and export potential. The introduction of competition, facilitated by the ADP, has led to improved product quality, reduced prices, and increased consumer choice.

The ADP also served as a foundation for the Auto Industry Development and Export Policy (AIDEP) 2021–2026, which builds upon the successes achieved under the ADP. Provisions such as duty-free import of plant and machinery and concessional customs duty rates have reduced production costs and increased the industry's attractiveness to investors. These incentives have enabled manufacturers to upgrade their technology, improve efficiency, and enhance product quality, ultimately contributing to the industry's growth and development.

The ADP 2016–2021 has played a crucial role in transforming Pakistan's automobile industry, attracting investment, promoting competition, and enhancing competitiveness.

The production trends of Pakistan's automobile industry from 2015 to 2021 reflect fluctuating performance. The production value increased dramatically to 3,978 billion rupees, then declined to 2,114 billion rupees in 2019–2020 due to the COVID-19 pandemic. It subsequently rebounded significantly to 3,417 billion rupees in 2020–2021. A detailed account of these production trends is provided below for reference.

Production Trend of Automobile Sector of Pakistan 2016-21 (In Rs. Billions)						
Products	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Cars	180	187	218.5	211	98	161.
Jeeps/ SUV	0.78	3.5	13	7.5	6.	28.7
Pick Up/ LCV/ Van	38.5	27.5	32.5	25	16	25.
Total	219	218	264	244	120.8	215
Trucks	7	10	9	6	3.3	6.2
Buses	1.4	1.4	1	1.14	0.6	0.66
Total	8	11.4	10	7	3.9	6.86
Tractors	34	48	72	50	22.3	50
Motorcycles	2.12	2246	3245	2789	1783	2815
Auto Rickshaw & 3 Wheelers	58	84	110	118	58	101
Grand Total	2677	2837	3978	3463	2114	3414

Source: (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021)

Analysis of Automobile Development and Export Policy (AIDEP) 2021-26

The Auto Industry Development and Export Policy (AIDEP) 2021-26 is a forward-looking framework designed to propel the growth and development of Pakistan's automobile industry. The AIDEP aims to promote the adoption of new technologies, particularly Electric Vehicles (EVs), through targeted incentives and support measures. This initiative is expected to drive innovation, reduce carbon emissions, and enhance the industry's competitiveness.

The AIDEP has introduced new tariff lines, rationalizing the tax structure and lowering production costs for manufacturers. This step is anticipated to boost investment, improve efficiency, and promote economies of scale. Furthermore, the policy includes a new product strategy encouraging the development of innovative products and enabling manufacturers to diversify their offerings.

A key priority of the AIDEP is the implementation of safety regulations, aligning Pakistan's standards with international best practices to ensure the production of safer vehicles. This measure is essential for enhancing consumer safety, reducing accidents, and facilitating the export of vehicles to global markets.

Another major focus of the AIDEP is promoting local part manufacturing to develop a robust and self-sufficient supply chain. This initiative is expected to reduce reliance on imports, increase local content, and create employment opportunities in the manufacturing sector.

The AIDEP also sets an ambitious target of exporting vehicles and parts equivalent to 10% of the Cost and Freight (C&F) value of imports, marking a significant shift towards export-oriented growth. This goal is anticipated to enhance the industry's competitiveness, boost foreign exchange earnings, and contribute to Pakistan's economic development.

Tax Incentives under AIDEP 2021-26

The AIDEP 2021-26 provides a range of tax incentives to support the development of Pakistan's automobile industry. Particular emphasis has been placed on promoting EVs, hybrids, 2-3 wheelers, and the agricultural sector (tractors). A detailed account of the tax exemptions in these sectors is summarized in the table below for reference.

S. No.	Auto Policy	Tax Exemptions Granted
1.	AIDEP 2021-26	Customs Duty (CD) on localized parts at 15% for Agricultural Tractors
2.		Customs Duty (CD) on localized parts at 30% for motorcycles exceeding 125 cc, motorcycle rickshaws and auto-rickshaws exceeding 200cc
3.		1% Customs Duty on parts specific to Electric Vehicles
4.		1% Sales Tax on sale of locally manufactured EVs
5.		Zero taxes and duties for capital machinery imports and charging infrastructure
6.		1% Customs Duty on electric buses and trucks
7.		3% Custom Duty on parts specific to plug-in hybrids
8.		4% Custom Duty on parts specific to normal hybrids

Table: Tax incentives under AIDEP 2021-26

Source: (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021)

Working Party (WP)- 29

WP.29 is the Working Party of the United Nations Economic Commission for Europe (UNECE) and serves as a UN forum for the harmonization of vehicle regulations. Established in 1952 as the "Working Party of Experts on Technical Requirements of Vehicles," it was renamed in 2000 to its current title.

Pakistan is among the countries that have acceded to WP.29's 1958 Agreement, which addresses the technical prescriptions for the construction and approval of wheeled vehicles, as well as their periodic technical inspections. WP.29 is responsible for managing the multilateral agreements signed in 1958, 1997, and 1998, which govern technical prescriptions and standards for vehicle construction and inspections. Additionally, WP.29 develops and amends UN Regulations, UN Global Technical Regulations, and UN Rules.

By acceding to the 1958 Agreement, Pakistan has committed to adopting the technical prescriptions and protocols for the type approval of vehicles and components. This obligates Pakistan to recognize type approvals granted by other contracting parties to the agreement.

The 1958 Agreement operates on principles of type approval and reciprocal recognition. Any country that accedes to the agreement has the authority to test and approve a manufacturer's design of a regulated product, regardless of the country of production. Once a type approval is granted by one country, all other acceding countries are required to honor it.

In 2020, the Government of Pakistan acceded to 17 out of the 170 regulations established under the 1958 Agreement. A detailed list of the regulations to which Pakistan has acceded is provided below for better understanding.

Description	UN Regulations (UNRs)	Vehicle Category
Brakes	R 13 & R 13H	Passenger Cars and Vans + Commercial Vehicles and Buses
Steering	R 79	Passenger Cars and Vans + Commercial Vehicles and Buses
Tyres	R 30	Passenger Cars and Vans
Lighting	R 48	Passenger Cars and Vans + Commercial Vehicles and Buses
Safety Belts Anchorage & Belts	R 14 & R 16	Passenger Cars and Vans + Commercial Vehicles and Buses
Seats/ Head Restrain	R 17 & R 25	Passenger Cars and Vans
Collision	R 94, R 95, & R 135	Passenger Cars and Vans
Airbags	R 121, R 114	Passenger Cars and Vans
Safety Glazing	R 43	Passenger Cars and Vans
Mirror & Cameras	R 46	Passenger Cars and Vans + Commercial Vehicles and Buses
Anti-theft	R 18	Passenger Cars and Vans + Commercial Vehicles and Buses

Table: The regulations for safety measures

Source: (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021)

The obligatory export

The obligatory export targets are designed to promote export-oriented growth, increase foreign exchange earnings and enhance the industry's competitiveness. By setting these targets, the government aims to encourage manufacturers to focus on export markets, improve product quality and reduce their reliance on domestic sales. The targets will also help to promote

the development of local supply chains, increase employment opportunities and contribute to the country's economic growth. It is to identify here that the obligatory exports targets are the ambitious and the government of Japan raised concerns that the target is illogical and it will discourage the automobile trade between Pakistan and Japan. For that reasons, the Japan's government approached the WTO to settle the issue on international forum. For information, the government of Pakistan has defined the following obligatory export targets under the AIDEP 2021-26.

Financial Year	Mandatory export as % of C&F value
2021-22	0 %
2022-23	2 %
2023-24	4 %
2024-25	7 %
2025-26	10 %

Table: The obligatory export under AIDEP 2021-26

Source: (Engineering Development Board, Ministry of Industries and Production, Government of Pakistan, 2021)

Promotion of EVs and New Technologies

The Automotive Industry Development and Export Policy (AIDEP) 2021-26 prioritizes the promotion of Electric Vehicles (EVs) and new technologies as a strategic imperative for Pakistan's automotive industry. This focus aims to address pressing environmental and economic challenges while creating opportunities for industrial growth and employment generation.

Pakistan's vulnerability to climate change, combined with the transport sector's significant contribution to greenhouse gas emissions, necessitates the adoption of EVs and fuel-efficient green technologies. These initiatives aim to reduce emissions and mitigate the adverse impacts of climate change. By encouraging the adoption of innovative technologies and manufacturing practices, the policy seeks to drive industrial growth and enhance the competitiveness of Pakistan's automotive sector.

Investments in EVs and green technologies are expected to create employment opportunities, fostering economic development and social prosperity. Additionally, Pakistan's reliance on oil imports places a heavy burden on the current account deficit. Promoting fuel-efficient technologies and EVs aims to reduce the oil import bill, alleviating economic pressures. The policy also emphasizes enhancing energy security by adopting alternative energy sources and sustainable solutions to reduce dependence on fossil fuels.

Incentives for Hybrids

The AIDEP 2021-26 includes the following incentives for hybrid vehicles:

- Parts specific to plug-in hybrids: Concessionary Customs Duty (CD) rate of 3%.
- Parts specific to normal hybrids: Concessionary CD rate of 4%.
- Hybrid buses/trucks: Concessionary CD rate of 1%.
- Sales tax: Reduced rate of 8.5% for both locally manufactured and imported hybrids.

These incentives aim to promote the adoption of hybrid vehicles in Pakistan, supporting the transition toward environmentally friendly and fuel-efficient transportation solutions. By reducing customs duties and sales tax rates, the government seeks to encourage domestic production and importation of hybrid vehicles, contributing to a more sustainable and competitive automotive industry.

Concerns of Japan's Government

The Government of Pakistan announced the **Automobile Production Policy 2021-26** to facilitate the auto industry and foster competition among companies. The policy set a target to maximize vehicle production domestically and export **10%** of total production by 2026.

However, the Government of Japan raised concerns about the export component of the policy and threatened to approach the **World Trade Organization (WTO)** to address the issue. Pakistan plans to resolve the matter in accordance with international procedures and protocols. If bilateral efforts fail, the issue will be referred to the WTO Committees on **Market Access** and **Trade-Related Investment Measures (TRIMS)**. Should these efforts remain unresolved, the matter will escalate to the WTO's **Dispute Settlement Body (DSB)**, although this process could take approximately one year.

Major Players in the Automobile Industry

Pakistan's automotive industry is dominated by prominent players, including:

- Indus Motor Company
- Pak Suzuki Motor Co. Ltd.
- Honda Atlas Cars Ltd.

New entrants like **Tesla Industries (Pvt.) Ltd.** and **Hyundai Nishat Motor (Pvt.) Ltd.** are also making their mark with innovative products. Companies such as **Al-Haj FAW Motors (Pvt.) Ltd.** and **Kia Lucky Motors Pakistan Ltd.**

are further expanding their presence by offering diverse vehicle options to cater to varying consumer preferences. A detailed list of major automobile companies operating in Pakistan is provided below.

S. No.	Car Manufacturers	S. No.	Car Manufacturers
1.	Tesla Industries (Pvt.) Ltd	8.	Al-Haj FAW Motors (Pvt.) Ltd.
2.	Indus Motor Company Ltd.	9.	Al-Haj Automotive (Pvt.) Ltd.
3.	Pak Suzuki Motor Co. Ltd.	10.	Mg JW Automobile Pakistan (Pvt.) Ltd.
4.	M/S Sazgar Engineering Works Ltd.	11.	United Motors (Pvt.) Ltd.
5.	Ghandhara Nissan Ltd.	12.	Regal Automobile Industry Ltd.
6.	Honda Atlas Cars Ltd.	13.	Kia Lucky Motors Pakistan Ltd.
7.	JW Sez (Pvt.) Ltd.	14.	Hyundai Nishat Motor (Pvt.) Ltd.

*Table: The major Car Manufacturers
Source: Pakistan Revenue Automation Limited (PRAL)*

Import Bill of Pakistan

The **State Bank of Pakistan** reported a 5.76% year-on-year increase in Pakistan's petroleum import bill for November 2023, reaching **\$1.32 billion**. While the monthly petroleum import bill remained stable, the overall import bill rose by 2.86% year-on-year and 1.82% month-on-month. Petroleum products' share in the total import bill stood at **29.76%** in November 2023. However, the import bill for petroleum products declined by 35% in the first five months of the fiscal year.

The transport sector saw a **12% year-on-year decline** in imports, while agricultural and other chemicals experienced a **10.67% year-on-year increase**. Food imports surged by **14% year-on-year**, but showed a significant decrease of **19.5%** over the first five months of the fiscal year. The machinery import sector recorded a substantial **43% year-on-year increase**, signaling potential growth in industrial activities (SAMA Web Desk, 2023).

Analysis of National Electric Vehicle Policy 2019

The **National Electric Vehicle Policy (NEVP) 2019** is a strategic initiative aimed at promoting the adoption of Electric Vehicles (EVs) in Pakistan, focusing on reducing Greenhouse Gas (GHG) emissions, achieving sustainable development, and leveraging economic benefits. Pakistan is highly vulnerable to climate change, and the transport sector is a significant contributor to GHG emissions. The promotion of EVs aims to mitigate this issue.

Pakistan faces energy shortages and relies heavily on imported fuels, which puts pressure on the country's foreign exchange reserves. EVs offer an opportunity to reduce fuel imports and utilize the existing idle capacity in the national electricity grid. The **NEVP** estimates significant fuel savings and a reduced fuel import bill, resulting in substantial economic benefits for the country.

The policy sets target for introducing and sustaining EVs and infrastructure, including charging stations and manufacturing facilities, to support the growth of the EV industry. The policy presents a conservative estimate of benefits, indicating a potential for even greater advantages with increased EV penetration. The existing idle capacity in the national electricity grid can be utilized to support EV charging, optimizing energy resources and reducing waste. By addressing these situational factors, the **NEVP 2019** aims to create a supportive ecosystem for EV adoption, driving sustainable development, energy security, and economic growth in Pakistan.

The Export of Pakistan

The export data of Pakistan from **2020-21 to 2023-24** has been analyzed during this study. The export of automobiles and EVs reflects a concerning situation. Pakistan is far behind in the race for exports in the modern world. The export of EVs from Pakistan is **zero**, which is very alarming. A detailed account of Pakistan's exports during the specified period is provided below.

Vehicles Types	2020-21		2021-22		2022-23		2023-24	
	Quantity in Units	Export Value	Quantity in Units	Export Value	Quantity in Units	Export Value	Quantity in Units	Export Value
Motorcycle	11470	767.95	10187	837.93	30632	3710.33	45404	5840.23
Rickshaw	416	59.08	25	5.08	510	71.62	144	61.33
Tractors	1443	1498.27	4890	1744.22	7196	3703.61	11781	4002.66
Cars & Jeeps	0	0.00	0	0.00	0	0.00	0	0.00
Electric Vehicles	0	0.00	0	0.00	0	0.00	0	0.00
Buses & Trucks	0	0.00	1	7.89	2	22.74	7	76.96
Total:	13329	2325.30	15103	2595.12	38340	7508.30	57336	9981.19

Table: Export of Pakistan 2020-21 to 2023-24

Source: Pakistan Revenue Automation Limited (PRAL)

Legal and Institutional Framework Analysis

Legal Framework Analysis

The legal framework for regulating and managing the automobile sector in the country has been analyzed during the study. The major policies and Orders which have been issued for the purpose of development and sustenance of the automobile industry are as following:

- The Automobile Industry Development and Export Policy 2021-26
- The National Electronic Vehicle Policy 2019
- SRO 655/2006 dated 22.06.2006
- SRO 656/2006 dated 22.06.2006
- SRO 693/2006 dated 01.07.2006

S. No	Policies/Orders	Mandate	Issued by
1.	AIDEP- 2021-26	Automobile Industry Development and Export Policy, 2021-26	Ministry of Industries and Production (MoIP) Engineering Development Board
2.	NEVP- 2019	National Electric Vehicle Policy, 2019	Ministry of Climate Change
3.	SRO 655/2006 dated 22.06.2006	Allows vendors/ part manufacturers concessionary import of inputs	Federal Board of Revenue (FBR)
4.	SRO 656/2006 dated 22.06.2006	Authorizes assemblers/ OEMs import of CKD at concessionary Duty	
5.	SRO 693/2006 dated 01.07.2006	List of localized auto-parts on import of which assemblers have to pay additional duty	

Institutional Framework Analysis

S. #	Institutions	Role
1.	Ministry of Industries and Production	formulates policies to promote the growth and development of the automobile industry
2.	Engineering Development Board	Supports industrial development, including automotive manufacturing
3.	Ministry of Climate Change	Oversees environmental policies, including emission standards and green initiatives.
4.	Federal Board of Revenue	Responsible for taxation policies affecting the industry
5.	Ministry of Commerce	Involved in trade policy, export promotion, and regulation of imports
6.	Ministry of Planning Development and Reform	formulates long-term plans and policies for the automobile industry's growth and development
7.	Ministry of Energy (Power & Petroleum) Division	ensures the impact assessment of EVs on oil value chain, and plan future oil import and storage
8.	Ministry of Communication	Involve in infrastructure development and transportation policies
9.	Ministry of Foreign Affairs (MOFA)	Negotiates international trade agreements and treaties affecting the automobile industry and to promote export markets and foreign investment
10.	National Transmission and Dispatch Company	Specifying standards for smart metering of the charging infrastructure

Comparative Analysis of Pakistan's Automobile Sector Initiatives and Practices with Best Practices Around the World

China

The Chinese government initiated the development of Electric Vehicle (EV) technology in 2001, designating it as a priority science research project in the country's Five-Year Plan. This strategic decision marked the beginning of China's pursuit of a robust EV industry. In 2008, Wan Gang, China's Minister of Science and Technology, tested Tesla's inaugural EV model, the Roadster, signifying the government's interest in the technology. The government's support for the EV industry led to the sale of 500 EVs in China in 2009, a modest beginning that paved the way for future growth. Between 2009 and 2022, the government provided substantial subsidies totaling \$29 billion to support the EV industry, demonstrating its commitment to the sector's development. Notably, these subsidies were not limited to domestic industrialists; they also extended support to foreign entities, such as Tesla. This support enabled Tesla to establish production facilities in China, including its Shanghai Giga factory, which was constructed rapidly in 2019. China's strategic support for Tesla has yielded significant benefits, exemplifying the "catfish effect." Building on this success, China is now internationalizing its EV industry, with a focus on the Gulf Cooperation Council region. The government is pursuing innovative strategies such as Vehicle-to-Grid (V2G) integration, rapid product development, vertical integration, and supply chain control, particularly in battery production. This multifaceted approach aims to solidify China's position as a global leader in the EV industry, leveraging its technological prowess and economic influence to drive growth and innovation.

India

The Automotive Mission Plan 2016-26 (AMP 2026) underscores the significant contribution of the Indian automobile industry to the country's economy, accounting for approximately 7.1% of India's Gross Domestic Product (GDP). As the fourth-largest producer of vehicles globally, the industry achieved an impressive annual production of 25 million vehicles in 2016-17, solidifying its position as the largest manufacturer of two-wheelers, three-wheelers, and tractors worldwide. The Indian automobile policy fosters a conducive environment for Foreign Direct Investment (FDI) in the automobile sector, allowing foreign equity investment up to 100% without any minimum investment criteria. This liberal policy framework facilitates automatic approval for investments, providing a significant impetus to the industry's growth. By encouraging FDI, the government aims to enhance the industry's

competitiveness, technological capabilities, and global integration. The AMP 2026 vision is aligned with the government's initiatives to promote sustainable growth, innovation, and exports in the automobile industry. By leveraging India's large domestic market, skilled workforce, and competitive manufacturing costs, the industry is poised for significant expansion and development. The policy framework and investment incentives aim to drive the industry's transformation, enabling it to become a global leader in the automotive sector while contributing substantially to India's economic growth and development.

SWOT Analysis of Pakistan's Institutions Responsible for the Growth of the Automobile & EV Industry

SWOT analysis of the institutions (Ministries of Industries and Production Islamabad and Engineering Development Board (EDB) Islamabad), mainly responsible for the growth and development of the automobile and electric vehicle industries, has been conducted. The SWOT analysis of the aforementioned institutions is as follows.

SWOT Analysis of Ministry of Industries and Production Strength

The Ministry of Industries and Production of Pakistan plays a crucial role as a facilitator in creating an enabling environment conducive to industrial growth in the automobile sector. Through its advisory capacity, the ministry contributes to policy formulations that foster a supportive framework for the industry's development. By identifying the specific needs of the auto industry, the ministry ensures that policies address key challenges and opportunities, thereby enhancing the sector's competitiveness. The ministry is responsible for the enforcement of policies related to the automobile industry, including the Automotive Industry Development and Export Policy (AIDEP) 2021-26 and the National Electric Vehicle Policy (NEVP) 2019. Additionally, it oversees the issuance and restriction of quotas, ensuring that the industry operates within a structured and regulated environment. Through periodic reviews of existing policies, the ministry assesses their effectiveness and implements necessary revisions to align with the industry's evolving needs. The ministry also prioritizes skill development within the industry, recognizing the importance of human capital in driving growth and innovation. By promoting training and capacity-building initiatives, the ministry enables the industry to acquire the necessary skills and expertise to remain competitive in the global market. Through these efforts, the Federal Ministry of Industries and Production plays a vital role in shaping the trajectory of Pakistan's automobile industry.

Weaknesses

The policy formulation process in the Ministry of Industries and Production of Pakistan has been criticized for lacking a comprehensive baseline study, which would have provided a thorough understanding of the automobile industry's dynamics and needs. This omission has resulted in policies that may not effectively address the industry's challenges and opportunities. The ministry has also been accused of failing to proactively intervene in the auto industry, neglecting to provide the necessary support and guidance to foster growth and development. Furthermore, the industry's research and development (R&D) capabilities have been deemed weak, hindering innovation and technological advancements. Additionally, the ministry has been criticized for its lack of coordination with other relevant ministries, resulting in a fragmented approach to policy-making and implementation. This has led to policy inconsistencies and a lack of coherence in the government's approach to the automobile industry. These shortcomings have impeded the industry's potential for growth and development, despite the introduction of policies such as the Automotive Industry Development and Export Policy (AIDEP) 2021-26 and the National Electric Vehicle Policy (NEVP) 2019.

Opportunities

The Ministry of Industries and Production of Pakistan has emphasized the importance of localization in the automobile industry, recognizing the need to promote self-reliance and reduce dependence on foreign technology. To achieve this, the ministry has stressed the need for technology upgradation, aiming to enhance the industry's competitiveness and innovation capabilities. The ministry has also prioritized the development of human capital, seeking to produce highly skilled engineers who can drive the industry's growth and development. Furthermore, the establishment of joint ventures and coordination with international partners is encouraged, facilitating the transfer of knowledge and technology. The development of automotive clusters is another key strategy, aiming to create specialized hubs for the industry's growth and development. Skill development and training programs are also being implemented, ensuring that the workforce is equipped with the necessary expertise to support the industry's expansion. Finally, the ministry has recognized the importance of developing automobile infrastructure, including the establishment of modern manufacturing facilities, testing centers, and research institutions. These initiatives are aligned with the goals of the Automotive Industry Development and Export Policy (AIDEP) 2021-26 and the National Electric Vehicle Policy (NEVP) 2019, among other policies.

Threats

The automobile industry in Pakistan operates in a highly competitive global market, with regional players also vying for market share. However, the industry's capacity in Pakistan is limited, hindering its ability to compete effectively. Furthermore, the industry's product offerings are characterized by limited diversification, resulting in a lack of innovation and technological advancements. The industry is also constrained by stringent emission regulations, which necessitate significant investments in research and development to comply. Moreover, the industry's heavy reliance on the import of auto-parts poses significant challenges, including exposure to exchange rate fluctuations and supply chain disruptions. Notably, Pakistan has yet to export a single electric vehicle (EV), despite the National Electric Vehicle Policy (NEVP) 2019 aiming to promote the adoption of EVs. These challenges underscore the need for effective policy interventions, such as those outlined in the Automotive Industry Development and Export Policy (AIDEP) 2021-26, to address the industry's limitations and enhance its competitiveness. The Ministry of Industries and Production of Pakistan must prioritize strategies to enhance capacity, diversification, and innovation, while also promoting export-led growth and reducing reliance on imports. By doing so, the industry can become a significant contributor to Pakistan's economic development and global competitiveness.

SWOT Analysis of the Engineering Development Board (EDB)

Strengths of the Engineering Development Board

1. The EDB plays a crucial role in formulating and coordinating government policies related to the engineering sector, including the automobile industry. It works closely with the government to develop policies that promote the industry's growth and development. These policies aim to create a conducive environment for the industry to thrive, ensuring alignment with the overall government vision and promoting innovation, investment, and exports.
2. The EDB actively engages with the industry to understand its needs and concerns. It collaborates with industry stakeholders to develop policies and programs addressing their needs, providing a platform for discussions and support in training and development. This engagement fosters a culture of innovation and collaboration.
3. The EDB ensures coherence and consistency in policies related to the automobile industry. It collaborates with other government agencies to align policies, avoiding contradictions and adhering to international best practices. This effort creates a predictable and stable policy environment that encourages investment and growth.
4. The EDB supports research and development (R&D) initiatives in the automobile industry by providing funding and collaborating with

academia and research institutions to develop innovative solutions. This support enhances innovation and competitiveness.

5. The EDB promotes exports in the automobile industry by identifying opportunities, supporting the development of export-oriented products, and facilitating participation in international trade fairs and exhibitions, thus boosting global competitiveness.
6. The EDB offers technical training programs to industry stakeholders, enhancing skills in areas such as product design, manufacturing, quality control, supply chain management, and lean manufacturing. These programs encourage continuous learning and improvement in the industry.

Weaknesses of the Engineering Development Board

1. The EDB struggles with enforcing and effectively implementing policies due to limited resources, inadequate infrastructure, and insufficient manpower. Industry stakeholders are often unaware of policies and their benefits, highlighting the need for enhanced enforcement capabilities.
2. The EDB has limited innovation expertise in critical areas such as electric vehicles and autonomous vehicle technology. This gap hinders its ability to support the industry's growth, necessitating a focus on skill development in these domains.
3. The EDB's policy targets are often overly ambitious and not aligned with industry capabilities. They lack the specificity and feasibility of SMART objectives, requiring revision for better alignment with industry needs.
4. Bureaucratic delays and lengthy approval processes slow the EDB's policy implementation. The complex and time-consuming procedures undermine its effectiveness, emphasizing the need for streamlined processes.
5. The EDB suffers from limited representation of industry stakeholders in decision-making, resulting in a lack of understanding of industry needs. Enhanced representation is crucial for more informed decisions.
6. The EDB's lack of autonomy and interference from other government agencies undermine its effectiveness. Greater independence is needed to ensure policies align with industry needs.

Opportunities for the Engineering Development Board

1. The EDB can leverage its policies to create a favorable environment for investment and innovation, driving industry growth and competitiveness.
2. It can facilitate technology transfer and foreign collaborations, supporting the industry's technological advancement and enabling joint ventures between local and international companies.
3. The EDB can enhance export promotion by providing access to international markets, supporting the development of export-oriented products, and offering training programs to improve export competitiveness.

Threats to the Engineering Development Board

1. The global automobile industry is highly competitive, with Pakistan facing significant challenges from other countries, especially in Asia. This competition impacts the EDB's ability to promote the industry effectively.
2. Changes in regulatory policies and the legal framework can affect the EDB's role and decision-making processes. Adapting to these changes is critical to maintaining its effectiveness.
3. Political interference can hinder the EDB's autonomy and decision-making processes, potentially prioritizing political considerations over industry needs and slowing down its operations.

Gap Analysis of Current Policies, Initiatives, Practices, and Institutional and Legal Framework

The following gaps were identified by analyzing the current policies, initiatives, practices, and legal and institutional framework:

1. Incentive Structure

- The current incentives do not sufficiently motivate localization, exports, or the adoption of new technologies, hindering industry growth and development.
- Limited scope and scale of incentives fail to attract significant investment.
- Insufficient support for innovation and technology adoption restricts industry growth.
- Policies do not effectively promote exports, limiting growth potential.

2. Infrastructure Deficiency

- Pakistan's automobile industry lacks modern and efficient infrastructure, including manufacturing facilities, testing centers, and training institutes.
- Outdated infrastructure hampers industry development.
- Limited government investment in infrastructure restricts competitiveness and global standard alignment.

3. Logistics and Transportation

- Underdeveloped logistics and transportation infrastructure increase costs and reduce efficiency.
- Poor road networks and inadequate logistics infrastructure hinder industry growth.
- Insufficient government investment in logistics infrastructure impacts competitiveness.

4. Weak Supply Chain

- The supply chain for auto parts is fragile, with local suppliers facing challenges in financing, technology, and skilled labor.
- Policies fail to support local suppliers, limiting their growth and the industry's development.

5. Limited Competition

- Dominance by a few major players limits competition, innovation, and investment.
- Policies do not encourage market competition, restricting industry growth.

6. Environmental Sustainability

- Significant environmental impact due to a lack of focus on eco-friendly vehicles and sustainable practices.
- Policies fail to promote environmental sustainability within the industry.

7. Unclear Export Strategies

- Ambitious export targets lack clear strategies for achievement.
- Policies do not provide a roadmap for export growth, limiting industry potential.

8. Weak Policy Enforcement

- Ineffective enforcement of policies and regulations leads to non-compliance.
- Institutional capacity for enforcement is inadequate, impacting industry growth.

9. Electric Vehicle (EV) Adoption

- Unclear targets and timelines for EV adoption hinder progress.
- Limited incentives and underdeveloped charging infrastructure restrict EV adoption.
- Import duties favor internal combustion engine vehicles over EVs, discouraging transition.

10. Research and Development (R&D)

- Limited investment in R&D hampers innovation and growth.
- Policies fail to promote significant investment in technological advancements.

11. Workforce Development

- Workforce lacks specialized skills in EV technology.
- Insufficient training and development programs restrict industry progress.

12. Battery Recycling

- Unclear policies on battery recycling raise environmental concerns.

Stakeholder Analysis

The development of Pakistan's automotive industry involves a range of stakeholders, including the government, foreign investors, manufacturing units, new entrants, the general public, and industry workers. Each stakeholder has distinct interests, expectations, and influences shaping the industry's trajectory.

The Government of Pakistan

The Government of Pakistan, as a paramount stakeholder in the automotive industry, possesses a multifaceted set of interests and expectations. Primarily, the government is driven by a desire to foster economic growth, enhance the country's competitiveness in the global market, and increase exports. Moreover, it seeks to attract foreign investment, create employment opportunities, and improve the overall standard of living for its citizens.

In terms of expectations, the government anticipates the effective implementation of policies and regulations to support the industry's development, including the establishment of Special Economic Zones (SEZs) and the provision of incentives for manufacturers. Furthermore, it expects the industry to adhere to stringent quality and safety standards, comply with environmental regulations, and contribute to the nation's technological advancement.

The government's influence on the industry is profound, as it has the authority to establish and enforce policies, regulations, and incentives that shape the industry's trajectory. Through its various ministries and agencies, such as the Ministry of Industries and Production and the Pakistan Automotive Manufacturing and Development Company (PAMADCO), the government plays a crucial role in shaping the industry's development. Therefore, the government's interests, expectations, and influence are pivotal in determining the fate of the automotive industry in Pakistan.

The Government of Japan

The Government of Japan, as a pivotal stakeholder in the Pakistani automobile industry, possesses a distinct set of interests that shape its engagement with the sector. Japan's primary interest lies in expanding its automotive market share in Pakistan, thereby consolidating its position as a leading player in the global industry.

To achieve this, Japan seeks to protect the interests of its investors and manufacturers operating in Pakistan, ensuring a favorable business environment that fosters growth and profitability. Furthermore, Japan is keen to promote the export of its vehicles and automotive parts to Pakistan, capitalizing on the country's growing demand for high-quality vehicles. Additionally, Japan aims to encourage technology transfer and collaboration between its companies and Pakistani counterparts, thereby enhancing the industry's technological capabilities and competitiveness. By doing so, Japan seeks to support the development of Pakistan's automotive industry in a manner that aligns with its economic and strategic interests.

The Government of Japan expects a range of outcomes from its engagement with the Pakistani automobile industry. It expects favorable trade agreements and regulatory frameworks that facilitate the entry and operation of Japanese companies in Pakistan. Japan further expects the protection of its intellectual property rights and investments, ensuring a secure and predictable business environment. Additionally, Japan anticipates access to a skilled and competent workforce, enabling its companies to operate efficiently and effectively.

A stable and predictable business environment, free from undue regulatory burdens and political risks, is also a key expectation for Japan. Moreover, Japan seeks opportunities for collaboration with Pakistani companies and research institutions, fostering innovation and technological advancement in the industry.

The Manufacturing Units

The manufacturing units, comprising both domestic and foreign players, constitute a vital stakeholder group in the Pakistani automobile industry. These units, engaged in the production of vehicles and automotive parts, have a profound interest in the industry's growth and development. Their primary interest lies in maximizing profits, reducing production costs, and increasing market share.

To achieve these objectives, manufacturing units seek a favorable business environment characterized by minimal regulatory hurdles, access to high-quality inputs, and a skilled workforce. The manufacturing units expect a range of outcomes from their engagement with the industry. They anticipate access to incentives and subsidies that enable them to compete with global players. They also expect a stable and predictable supply chain, ensuring the timely delivery of high-quality inputs.

Additionally, manufacturing units expect government support in terms of investment in infrastructure, research and development, and human capital development. They seek a favorable trade regime to export their products to

international markets. Furthermore, manufacturing units seek protection from unfair competition, ensuring a level playing field for all industry players.

The influence of manufacturing units on the industry is significant, as they play a crucial role in shaping the industry's development trajectory. Through their investments, production, and employment practices, manufacturing units contribute to the industry's growth and competitiveness. Their interactions with suppliers, customers, and regulatory bodies also influence the industry's structure and evolution. Moreover, manufacturing units have the capacity to shape industry trends, drive innovation, and influence consumer preferences. Therefore, their interests, expectations, and influence are critical in determining the fate of the Pakistani automobile industry.

The New Entrants in the Automobile Industry

The new entrants in the automobile market of Pakistan, comprising both domestic and foreign players, constitute a distinct stakeholder group with unique interests and expectations. These new entrants, seeking to establish a foothold in the industry, have a primary interest in accessing the market and gaining a competitive edge.

They aim to capitalize on the growing demand for vehicles in Pakistan, leveraging their innovative products, services, and business models to capture market share. The new entrants expect a range of outcomes from their engagement with the industry. They expect a favorable regulatory environment, enabling them to enter the market with minimal barriers and bureaucratic hurdles. They anticipate access to adequate infrastructure, including roads, ports, and logistics facilities, to facilitate their operations.

Additionally, new entrants expect a skilled and competent workforce capable of supporting their production and sales activities. They also expect a competitive market structure, free from undue barriers and restrictive practices, allowing them to compete on a level playing field.

The influence of new entrants on the industry is significant, as they bring innovation, competition, and dynamism to the market. Through their entry, they challenge incumbent players, driving them to improve their products, services, and processes. New entrants also contribute to the industry's growth, creating new employment opportunities and enhancing the industry's technological and managerial capabilities. Moreover, they influence consumer preferences, shaping the industry's product and service offerings. Therefore, the interests, expectations, and influence of new entrants are crucial in shaping the future trajectory of the Pakistani automobile industry.

The General Public

The general public, comprising individuals and households, constitutes a vital stakeholder group in the Pakistani automobile industry, as they are directly affected by the industry's activities and outcomes. The general public has a primary interest in accessing affordable, safe, and reliable transportation, which is critical to their daily lives, livelihoods, and well-being.

They expect the automobile industry to provide a range of vehicles that meet their diverse needs, preferences, and income levels. The general public expects several outcomes from the automobile industry. They expect access to vehicles that meet stringent safety and environmental standards, minimizing the risk of accidents and environmental degradation.

They also anticipate affordable vehicle prices, financing options, and maintenance costs, enabling them to own and operate vehicles without undue financial burden. Additionally, the general public expects a comprehensive network of roads, highways, and transportation infrastructure, facilitating safe and efficient travel.

They also expect the industry to provide employment opportunities, contribute to economic growth, and support social development. The influence of the general public on the industry is significant, as their preferences, behaviors, and expectations shape the industry's product and service offerings.

Through their purchasing decisions, the general public influences the demand for specific vehicle types, features, and technologies, driving the industry's innovation and investment strategies. Moreover, the general public's expectations regarding safety, environmental sustainability, and social responsibility shape the industry's regulatory environment and corporate social responsibility initiatives. Therefore, the interests, expectations, and influence of the general public are crucial in determining the industry's trajectory and its impact on the Pakistani economy and society.

The Workers in the Automobile Industry

The workers in the automobile market of Pakistan, comprising laborers, technicians, and professionals, constitute a vital stakeholder group as they are directly engaged in the production, sales, and service of vehicles. These workers have a primary interest in securing decent employment, fair compensation, and safe working conditions, which are essential to their well-being and livelihoods. They expect the industry to provide opportunities for skill development, career advancement, and social protection.

The workers in the automobile industry expect several outcomes from their engagement with the sector. They expect fair wages and benefits commensurate with their skills and contributions to the industry. They

anticipate a safe and healthy work environment, free from hazards and risks that might affect their physical and mental well-being. Additionally, workers expect opportunities for training and development, enabling them to enhance their skills and adapt to technological changes. They also expect a stable and secure employment relationship, protected by labor laws and regulations.

The influence of workers on the industry is significant, as their skills, efforts, and commitment shape the industry's productivity, quality, and innovation. Through their daily work, workers contribute to the design, production, and delivery of vehicles, influencing the industry's reputation and competitiveness. Moreover, workers' experiences, concerns, and expectations shape the industry's human resource policies, labor relations, and corporate social responsibility initiatives.

Therefore, the interests, expectations, and influence of workers are crucial in determining the industry's performance, social impact, and sustainability in Pakistan.

Issues and Challenges in Policy Implementation

1. The setting of unrealistic targets for the industry's growth and development poses significant challenges for stakeholders (Ghumman, 2024).
2. The monopoly of large corporations limits competition, innovation, and market access for smaller players.
3. The slow pace of localization hinders the industry's ability to develop indigenous capabilities and reduce reliance on imports.
4. The reliance on imported auto parts for assembly and production constrains the industry's growth and competitiveness (J. Seirut, 2023).
5. The influx of used vehicles and auto parts undermines the domestic industry's development and poses environmental concerns (Business Recorder, 2023).
6. The limited availability of skilled labor and trained professionals hinders the industry's innovation and growth.
7. The Japanese government's policies and regulations pose challenges for Pakistan's automobile industry, particularly in terms of trade and investment (Ghumman, 2024).
8. The lack of supporting infrastructure for emerging technologies, such as electric vehicles, hinders their adoption and development.
9. The lack of FTAs and PTAs limits the industry's access to global markets and raw materials.
10. The inadequate provision of incentives and subsidies by the government constrains the industry's growth and development.
11. The slow pace of charging infrastructure development hinders the adoption of electric vehicles.

12. The rapid adoption of electric vehicles without adequate infrastructure upgrades poses significant risks to the power grid.
13. The high costs of production and purchase pose significant challenges for both manufacturers and consumers (Mustafa, 2023).
14. The limited availability of raw materials hinders the industry's growth and development.
15. The lack of thorough research and analysis leads to ineffective policies and regulations.
16. The significant import bill for auto parts and vehicles poses challenges for the country's trade balance.
17. The neglect of public transport development hinders the industry's growth and sustainability.
18. The failure to effectively market the economic benefits of electric vehicles constrains their adoption.

Conclusion

The Government of Pakistan has implemented a series of initiatives aimed at fostering the development and competitiveness of the automotive industry. These programs and policies, including the Deletion Program, Tariff-Based System, Auto Industry Development Program, Automotive Development Policy, National Electric Vehicle Policy, and Auto Industry Development & Export Policy, have had a profound impact on the industry, promoting growth, investment, innovation, and sustainability.

Through these initiatives, the government has sought to reduce reliance on imports, promote local manufacturing, and enhance the industry's export potential. The policies have encouraged the development of a local supply chain, with new auto parts manufacturing facilities established to support the growing industry. The National Electric Vehicle Policy, in particular, aims to promote sustainable transportation and mitigate climate change by reducing emissions. This policy seeks to position Pakistan as a key player in the global electric vehicle value chain, generating employment opportunities and contributing to a sustainable future.

The cumulative effect of these policies has transformed the automotive industry in Pakistan into a vibrant and competitive sector, with manufacturers producing high-quality vehicles for both domestic and international markets. The government's commitment to promoting a competitive and sustainable automotive sector remains a key driver of growth and development in Pakistan.

Recommendations

Based on the issues and challenges identified in Pakistan's automobile industry through the study of related policies, initiatives, legal provisions, practices, and processes, the following short-term, medium-term, and long-term policy recommendations are proposed:

Short-term

Comprehensive Tax Incentive Review

A thorough review of tax incentives is necessary to align them with national objectives, enhance industry competitiveness, and promote sustainable growth. The review should evaluate the impact of incentives on investment, employment, and exports, involving stakeholder consultations to ensure a balanced approach.

Reassessment of Export Targets

Obligatory export targets should be reviewed to ensure they are realistic, achievable, and aligned with national goals. This process must consider the industry's capacity, global market trends, and trade agreements.

Enhancing Human and Technical Competence

Industry-focused training programs should prioritize upskilling and reskilling workers. Technology transfer agreements can support the adoption of advanced technologies, with international collaboration enhancing overall capabilities.

Signing Free Trade Agreements (FTAs) and Preferential Trade Agreements (PTAs)

New trade agreements can boost exports, foster investment, and increase competitiveness. Negotiations should align with industry needs and global market dynamics.

Addressing Japanese Government Concerns

Resolving issues related to the Special Trading Company (STC) is crucial for fostering bilateral cooperation and encouraging investment. Dialogue should emphasize mutual benefits and collaboration.

Resolving Business Community Concerns

Engaging stakeholders to address challenges and facilitate dialogue is essential for creating a conducive business environment.

Inter-Ministerial Coordination

Improved collaboration among ministries can ensure a coherent and logical policy framework, enhancing the effectiveness of implementation.

Conversion to Electric Vehicles (EVs)

Encouraging the conversion of Light Vehicles (LVs) to EV kits can reduce emissions and promote sustainable transportation, supported by targeted incentives and subsidies.

Mid-term

Localization of the Automobile Industry

Promoting local production through incentives, technology transfer, and skills development can reduce reliance on imports and enhance competitiveness.

Infrastructure Development

Investments in roads, ports, and logistics facilities are essential to support production capacity and industry growth, facilitating sustainable transportation.

EV Infrastructure Development

Establishing charging stations and related facilities can accelerate EV adoption, contributing to reduced emissions and environmental sustainability.

Transformation of Public Transport

Transitioning traditional public transport systems to EVs can improve air quality and promote sustainable practices, supported by incentives and subsidies.

Economic-Centric EV Policy

Introducing a policy that balances economic growth with sustainability can drive EV adoption and industry development, addressing market trends and national priorities.

Local Auto-Parts Production

Encouraging local production of auto parts through incentives and skills development can reduce imports and strengthen industry growth.

Simplification of Procedures

Streamlining business processes can enhance ease of doing business, promote investment, and encourage entrepreneurship. Regulatory reforms should focus on simplifying registration, licensing, and permitting.

Renewable Energy Integration

Utilizing solar and wind energy for EV charging can reduce emissions and support sustainability. Investments in renewable energy infrastructure can further encourage EV adoption.

Long-term

Enhancing Competition through New Entrants

Policies should incentivize new investments, technology transfer, and skills development to foster innovation and growth.

International Market Surveys

Conducting market research can identify export opportunities, promote trade, and guide investment strategies to enhance competitiveness.

Public-Private Partnerships (PPPs)

Collaboration between the public and private sectors can drive industry development, promote investment, and improve competitiveness through technology transfer and infrastructure projects.

Identifying Industry Needs

Regular assessments of industry needs can inform policy-making, ensuring alignment with market dynamics and long-term development goals.

Practical Plan Using Log Matrix to Address Identified Issues and Problems

A comprehensive study of the automobile and EV sectors has revealed critical fault lines hindering the development of Pakistan's automobile industry. These include:

1. Absence of adequate infrastructure for EV sector development
2. Ambitious targets under AIDEP 2021-26 and NEVP-2019
3. Slow localization
4. Reliance on auto-parts imports
5. Capacity constraints in the automobile industry
6. Enforcement and coordination challenges

Issue-wise Plan

Absence of Adequate Infrastructure for EV Sector Development

The lack of dedicated EV manufacturing facilities, charging infrastructure, and research and development centers obstructs the adoption of EVs.

Proposed Actions:

- Establish EV-specific manufacturing zones.
- Develop a nationwide EV charging network.
- Invest in R&D institutions focusing on EV technologies.
- Facilitate public-private partnerships to accelerate infrastructure development.

Ambitious Targets under AIDEP 2021-26 and NEVP-2019

While commendable, the ambitious targets require meticulous planning, coordination, and support for successful implementation.

Proposed Actions:

- Break down targets into achievable milestones with clear timelines.
- Strengthen inter-ministerial collaboration to ensure coordinated policy enforcement.
- Provide incentives to industry players to meet localization, export, and EV adoption targets.

Slow Localization

The gradual pace of localization has led to dependency on imported components, limiting self-reliance and competitiveness.

Proposed Actions:

- Prioritize localization by setting up auto-parts manufacturing facilities.
- Promote R&D centers and skill development programs for local production.
- Offer tax incentives and subsidies for businesses investing in localization.

Reliance on Auto-Parts Imports

This dependence exposes the industry to exchange rate volatility, supply chain disruptions, and limited access to advanced technologies.

Proposed Actions:

- Incentivize local manufacturing of auto-parts through research grants and tax benefits.
- Encourage technology transfer agreements with global partners.
- Establish a robust local supply chain for critical components.

Capacity Constraints in the Automobile Industry

Limited production volumes and outdated technologies hamper global competitiveness.

Proposed Actions:

- Modernize manufacturing technologies through government-backed investments.
- Launch programs to upskill the workforce in advanced automotive technologies.
- Enhance production capacity by supporting process optimization and efficiency initiatives.

Enforcement and Coordination Challenges

Weak policy implementation and fragmented efforts among stakeholders impede growth.

Proposed Actions:

- Create a dedicated coordination body for policy implementation and stakeholder engagement.
- Facilitate regular communication between policymakers, industry players, and other relevant entities.
- Monitor and evaluate policy outcomes to ensure accountability and alignment with objectives.

Summary of Approach

This plan emphasizes targeted investments, incentives, and collaboration across government, industry, and other stakeholders. By addressing these fault lines systematically, the automobile and EV sectors can achieve sustainable growth and global competitiveness.

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Enhancing E-Commerce for Economic Development

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Abstract:

Pakistan's e-commerce sector is rapidly growing, driven by ICT investments and a youthful population, reshaping the economic landscape. The 2019 E-commerce Policy Framework has played a pivotal role in this expansion, with revenues projected to rise significantly by 2029. However, challenges like inadequate infrastructure, reliance on cash-on-delivery, and weak consumer protection enforcement limit its potential. Federal and provincial initiatives focus on improving digital infrastructure, promoting digital payments, and supporting SMEs and youth, yet gaps in implementation and regulation persist. To address these issues, recommendations include SME funding programs, harmonizing tax laws, enhancing logistics, strengthening consumer protection, and ensuring data security. Drawing on best practices from India, China, and the US, Pakistan can create an inclusive e-commerce ecosystem. Coordinated government action, private-sector engagement, and global strategies are crucial to overcoming barriers, unlocking the sector's potential, and driving economic growth, job creation, and entrepreneurship across all regions and demographics.

Key words:

E-commerce growth, digital infrastructure, SME support, consumer protection, economic transformation

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Introduction

The rapid growth of Pakistan's e-commerce sector, driven by investments in ICT infrastructure and a youthful, tech-savvy population, is transforming the economic landscape. Government initiatives, such as the 2019 E-commerce Policy Framework, have played a pivotal role in fostering this expansion, enabling online transactions and increasing the number of registered e-commerce merchants. By the end of 2024, the sector is projected to generate \$5.035 billion in revenue, with expectations of reaching \$6.711 billion by 2029. This growth not only contributes significantly to GDP but also creates job opportunities, particularly for the youth, and promotes entrepreneurship and SMEs through accessible digital platforms.

However, several challenges need to be addressed to fully harness the potential of e-commerce for economic development in Pakistan. These include inadequate infrastructure, reliance on cash-on-delivery (COD) payments, inconsistent enforcement of consumer protection laws, and high shipping costs. By implementing coordinated efforts across government institutions, enhancing digital infrastructure, promoting secure online payment systems, and fostering technological adoption, Pakistan can create a more conducive environment for e-commerce. This policy paper explores these issues in depth, providing recommendations to overcome existing barriers and unlock the sector's full potential for sustainable economic growth.

Literature Review

The flourishing e-commerce sector in Pakistan, bolstered by significant investments in ICT infrastructure and a vibrant, tech-savvy youth demographic, has dramatically reshaped the nation's economic landscape. Government initiatives, notably the 2019 E-commerce Policy Framework, have ignited this transformation, fostering an environment ripe for online transactions and a surge in registered e-commerce merchants. Forecasts suggest the sector will generate \$5.035 billion in revenue by the end of 2024, with aspirations to reach \$6.711 billion by 2029. This burgeoning growth strengthens GDP, creates numerous job opportunities for the youth, and nurtures entrepreneurship and the proliferation of SMEs through accessible digital platforms.

Despite these promising advancements, formidable challenges persist, hindering the full realization of e-commerce's vast potential for economic development. Key obstacles include inadequate infrastructure, overdependence on cash-on-delivery payments, inconsistent enforcement of consumer protection laws, and prohibitive shipping costs. Overcoming these issues requires enhanced digital infrastructure, promotion of secure online payment systems, and efforts to foster widespread technological adoption.

This policy paper meticulously explores these concerns, presenting a comprehensive examination of Pakistan's e-commerce landscape. It underscores the pivotal role e-commerce plays in driving economic growth by contributing to GDP, generating employment, and fostering entrepreneurship. The sector's expansion, accelerated by the COVID-19 pandemic, has diversified the e-commerce ecosystem with an increasing number of registered merchants. By the end of 2024, an estimated 7,000 registered e-commerce merchants are expected to contribute significantly to the national economy.

Investments in digital infrastructure and technological advancements have been instrumental in sustaining this growth. Government support has been crucial in creating an environment conducive to digital trade. E-commerce enables businesses to transcend geographical barriers, reaching remote areas and contributing to the economic uplift of less developed regions. It has also facilitated cross-border trade, diversifying export markets through initiatives such as the China-Pakistan Economic Corridor (CPEC).

However, challenges remain. The predominance of cash-on-delivery payments, accounting for 80% of transactions, causes cash flow issues and increases fraud risks. Despite the State Bank of Pakistan's efforts to promote digital payments, adoption remains sluggish due to security concerns. Inconsistent enforcement of consumer protection laws erodes consumer trust, emphasizing the need for robust regulatory frameworks.

Internationally, high shipping costs, convoluted customs procedures, and regulatory barriers hinder Pakistan's e-commerce competitiveness. Limited internet penetration, especially in rural areas where only 49% of the population has broadband access, restricts the sector's reach. The policy paper advocates for bridging this digital divide, enhancing digital literacy, and fostering a more inclusive digital economy.

To overcome these challenges, the policy paper recommends a multifaceted strategy. Drawing on best practices from countries like India and China, it emphasizes robust payment systems, comprehensive consumer protection laws, and efficient logistics and supply chains as essential components of a thriving e-commerce ecosystem. The experiences of these nations highlight the value of strategic investments in digital infrastructure and the creation of a secure, efficient, and consumer-friendly e-commerce environment.

Data Collection

Data for this study was collected from secondary sources, including research articles, published literature, and relevant publications.

Data Analysis

The study explores the current state of e-commerce in Pakistan and its potential for further enhancement. Its objectives include identifying bottlenecks and challenges, investigating issues faced by stakeholders, and proposing solutions to advance the sector effectively.

Statement of the Problem

E-commerce in Pakistan holds immense potential to drive economic development by boosting GDP growth, creating job opportunities, and fostering entrepreneurship. However, it faces significant challenges that hinder its ability to achieve this potential. This policy paper identifies these critical issues and explores strategic measures to address them. By tackling these barriers through coordinated efforts and visionary strategies, Pakistan can fully unlock the potential of its e-commerce sector, paving the way for sustainable economic growth.

Scope of the Research

This research examines the transformative impact of e-commerce on Pakistan's economy, propelled by investments in ICT infrastructure and a tech-savvy population. It evaluates the effectiveness of the 2019 E-commerce Policy Framework in facilitating online transactions and increasing registered e-commerce entities. Projections indicate substantial revenue growth in the sector from 2024 to 2029, underlining its contributions to GDP growth, job creation, and SME empowerment. While recognizing challenges such as infrastructural gaps and reliance on cash-on-delivery, the research proposes a strategic roadmap for improvement. Recommendations include enhancing digital infrastructure, promoting secure payment systems, and leveraging global best practices from countries like India and China. Key focus areas include empowering SMEs, strengthening consumer protection laws, harmonizing tax regulations, and optimizing logistics. The research emphasizes consistent policy implementation and public-private partnerships to foster a competitive and innovative e-commerce ecosystem, ultimately contributing to economic growth and improved livelihoods in Pakistan.

Research Methodology

This study adopts a qualitative and exploratory approach, rigorously investigating solutions to the identified challenges. Data was collected from secondary sources, including research articles, journals, and publications. The data was then analyzed using Gap Analysis, Institutional Analysis, SWOT Analysis, and PESTEL Analysis to provide actionable insights and recommendations.

Role of E-commerce in Economic Development of Pakistan

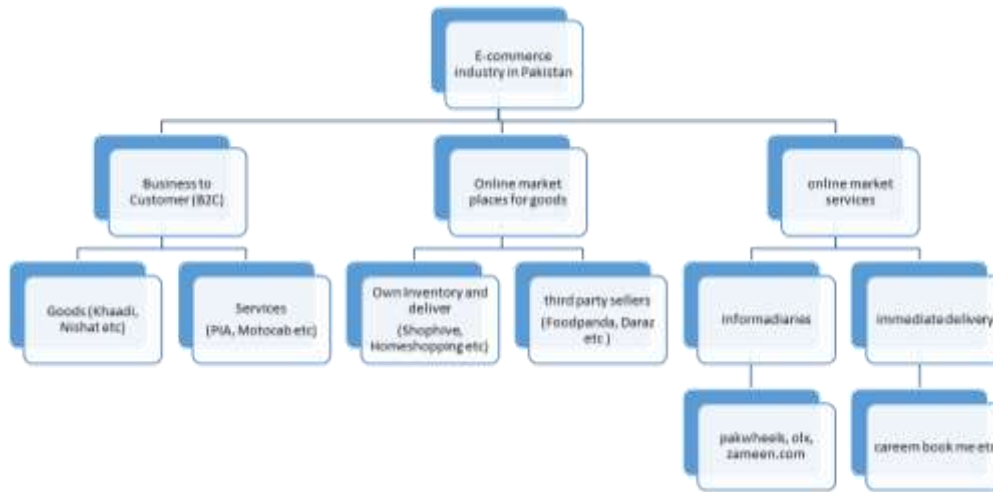
Pakistan's e-commerce industry exhibits significant growth potential, driven by investments in ICT infrastructure and a young, tech-savvy population, with over 60% of its 200 million people aged 15-29 ready for digital engagement. The sector's growth, accelerated by the COVID-19 pandemic, has increased online transactions and registered e-commerce merchants, supported by government initiatives like the 2019 E-commerce Policy Framework. By 2024, approximately 7,000 registered e-commerce merchants are expected to operate, generating \$5.035 billion in revenue, with projections reaching \$6.711 billion by 2029. This growth contributes significantly to Pakistan's GDP, translating into increased tax revenues and supporting economic stability and public services.

E-commerce expansion has created numerous job opportunities, particularly benefiting the youth, and promoted entrepreneurship and SMEs by providing low entry barriers and access to broader audiences through platforms like Daraz.pk and Telemart. Investments in digital infrastructure and technological advancements, including payment systems, cybersecurity, and logistics, have been driven by e-commerce growth, with government support fostering a conducive environment for digital trade.

E-commerce allows businesses to overcome geographical barriers, reaching remote areas and contributing to the economic development of less developed regions. The COVID-19 pandemic has transformed consumer behavior, enhancing market efficiency and consumer satisfaction through better prices and a wider product range. E-commerce also facilitates cross-border trade, diversifying export markets through initiatives like the China-Pakistan Economic Corridor (CPEC). The rise of e-commerce has driven the adoption of digital payment solutions, promoting financial inclusion and integrating more people into the formal financial system, thereby boosting economic growth.

Structure of E-commerce Industry in Pakistan

As of 2024, Pakistan's e-commerce industry has seen substantial growth, with approximately 7,000 registered e-commerce merchants operating in the market. This figure includes a wide range of businesses, from large-scale online marketplaces to smaller niche stores and startups.



The above diagram simplifies the understanding of the current market structure of Pakistan's e-commerce sector. The e-commerce sector in Pakistan has flourished through online platforms such as websites and apps, and is divided into retail platforms (e.g., Daraz.pk), niche retail platforms (e.g., Libertybooks), company-operated e-stores (e.g., Khaadi), and service platforms (e.g., Careem and Uber). Daraz.pk, initially an online clothing retailer, now operates as a consumer-to-consumer logistics company with corporate offices and warehouses and was acquired by the Alibaba Group in 2018. Additionally, Pakistan's freelancing market has grown significantly, ranking among the top five globally with \$0.5 billion in revenue. With 63% of the population under 25, government programs like E-Rozgar and DigiSkills support this thriving sector, which includes services such as content creation, translation, and virtual assistance.

Situational Analysis of Current Policies, Plans and Initiatives of the Federal and Provincial Governments Aiming at Enhancing E-Commerce Policies

Digital Pakistan Policy

The Government of Pakistan's Digital Pakistan Policy aims to improve citizens' quality of life and economic well-being through accessible, affordable, and high-quality ICT services, fostering a knowledge-based economy and socio-economic growth. Key objectives include developing a digital strategy, promoting technology in critical sectors, expanding e-commerce, empowering youth and women, fostering innovation, boosting software exports, improving ICT rankings, bridging the digital divide, promoting e-governance, attracting IT investments, and supporting persons with disabilities. Strategies include legislation, infrastructure development, human resource enhancement, local content creation, open-source promotion, and fiscal incentives for the IT/ITeS sector, with implementation

involving consistent monitoring and alignment of provincial initiatives with national goals.

Commerce Policy 2019 of Pakistan

Pakistan's e-commerce policy focuses on several key areas: establishing a National E-Commerce Council to streamline regulatory and facilitation efforts; recognizing the need to promote digital payments and reduce reliance on Cash on Delivery (CoD) while addressing barriers to digital payments; empowering SMEs and youth through training, access to finance, and the creation of e-commerce business facilitation hubs, despite execution gaps; enhancing consumer protection by amending laws, establishing consumer courts, and mandating customer support to build trust; addressing the contentious issue of balancing tax breaks with revenue protection without a clear plan for e-commerce taxation; overcoming digital inclusion barriers related to connectivity, affordable devices, and digital literacy, though funding strategies are unclear; improving logistics to enhance e-commerce growth, as current performance ranks poorly in the World Bank Logistics Performance Index; ensuring data protection to participate in global trade, yet lacking detailed discussion on adequacy; and tackling digital transformation challenges in the public sector by developing a clear roadmap for digitizing the Trade Development Authority of Pakistan (TDAP) and enhancing global connectivity through multilateral negotiations.

Gap Analysis of Pakistan's E-Commerce Policy E-commerce Regulatory and Facilitation Environment

Positive Aspect:

Establishment of the National E-Commerce Council with public and private sector representatives.

Gaps:

Lack of detailed plans for amending outdated legislation to meet evolving e-commerce needs.

Insufficient specific and measurable action items for implementation.

Ambiguity regarding the amendments needed for export promotion and re-export regulations.

Financial Inclusion and Digitization through Payments Infrastructure

Positive Aspect:

Recognition of the need to promote digital payments and reduce Cash on Delivery (CoD) transactions.

Gaps:

No effective strategy to address barriers such as access to financial products, transaction costs, and trust in digital payments. Ambitious targets without practical measures to overcome existing barriers.

Potential exclusion of consumers and women entrepreneurs due to CoD limits.

Lack of progress on establishing an international payment gateway, with no detailed plan to attract international payment providers like PayPal.

SMEs and Youth Empowerment

Positive Aspect:

Identification of key issues for SMEs, such as training, access to finance, and local language content.

Gaps:

No detailed plans on funding and executing initiatives.

Uncertainty about the capacity of the Small and Medium Enterprises Development Authority (SMEDA) to implement the initiatives.

Consumer Protection

Positive Aspect:

Ambitious recommendations for effective consumer protection, such as amending laws and establishing consumer courts.

Gaps:

Specific recommendations are ambitious but lack detailed implementation plans.

Absence of a clear timeline for legal amendments and establishment of support structures.

Taxation Structure

Positive Aspect:

Acknowledgement of the conflict between tax breaks for e-commerce growth and revenue protection.

Gaps:

No clear direction or specific plans for addressing the taxation issues.

General recommendations without tackling core taxation issues or providing clarity on achieving goals.

ICT Infrastructure and Telecom Services

Positive Aspect:

Identification of digital inclusion as a barrier to e-commerce development.

Gaps:

Lack of a detailed strategy on how to tackle barriers such as connectivity, affordable devices, digital literacy, and cultural norms.

No discussion on supporting home-grown IT solutions for e-commerce or enhancing local cloud services.

Logistics

Positive Aspect:

Acknowledgement of the crucial role of logistics in e-commerce.

Gaps:

Limited attention to the logistics gaps and steps needed for improvement.
Insufficient exploration of issues in peri-urban and rural areas, affordability, traceability, and reliability of logistics services.
No specific steps to make international deliveries cost-effective, such as negotiating lower costs or bilateral treaties.

Data Protection and Investment

Positive Aspect:

Recognition of the need for data protection to participate in global trade.

Gaps:

Lack of detailed discussion on the specific areas to be considered in Pakistan's Cloud Policy.

Insufficient insights into the adequacy of the proposed Data Protection Act.

Missing discussion on existing data issues, potential value of open banking, and secure data exchange for e-commerce.

7.2 SBP's National Financial Inclusion Strategy (NFIS) and Others

The State Bank of Pakistan (SBP) has introduced various strategies to bolster e-commerce growth, including the National Financial Inclusion Strategy (NFIS) to enhance financial access and promote digital payments, reducing cash transactions. The SBP's Challenge Fund for SMEs supports innovative banking solutions, digital payment systems, and e-commerce platforms. Additionally, the SBP has updated its regulatory framework to facilitate digital financial services, such as implementing EMVCo's 3D Secure protocol for fraud protection and secure online transactions. These initiatives collectively aim to create a more inclusive financial environment and encourage the expansion of e-commerce in Pakistan.

National Cyber-Security Policy 2021

The National Cyber-Security Policy 2021, by the Ministry of Information Technology and Telecommunication, addresses cyber threats in Pakistan's e-commerce sector. It aims to create a secure digital ecosystem through governance, risk management, and incident response mechanisms. However, challenges include limited cybersecurity infrastructure, a shortage of skilled professionals, and the need for continuous updates to keep pace with evolving threats.

Government Initiatives

The Pakistan Single Window (PSW)

The Pakistan Single Window (PSW) aims to streamline and digitize trade and customs processes, integrating customs, banks, and regulatory bodies to enhance e-commerce efficiency, potentially reducing import/export times by up to 47% and improving transparency. However, widespread adoption, better digital infrastructure, and robust cybersecurity are challenges.

The Universal Service Fund (USF)

The Universal Service Fund (USF) focuses on digital inclusion by expanding internet connectivity in underserved areas to bridge the digital divide and improve ICT infrastructure. However, it needs a holistic approach addressing digital literacy, cybersecurity, and consumer protection for maximal impact.

The DigiSkills Program

The DigiSkills program, initiated by the Ministry of IT and Telecom, provides essential digital skills through courses like E-Commerce Management, Digital Marketing, and Freelancing, training over two million individuals. To maximize its impact, practical skill application, continuous curriculum updates, advanced training, real-world business exposure, improved internet access, and cybersecurity concerns must be addressed.

Analysis of E-commerce Initiatives in the Provinces

Punjab has significantly improved digital infrastructure and internet connectivity to support e-commerce, launching programs to train young entrepreneurs and promote startups. The Punjab Information Technology Board (PITB) has provided platforms for e-commerce businesses and trained over 30,000 aspiring entrepreneurs through the E-Rozgar program. Sindh has focused on regulatory reforms, offering tax relief and simplified business registration processes to facilitate e-commerce. Khyber Pakhtunkhwa (KP) encourages SMEs to go digital through training programs and initiatives like the 'Digital Youth Summit.' Balochistan is enhancing digital literacy and infrastructure, investing in internet access and logistics networks, particularly through the China-Pakistan Economic Corridor.

Critical Analysis of the Existing Legal and Institutional Frameworks of the Federal Government and Provincial Authorities
Laws and Ordinances

The Electronic Transactions Ordinance 2002 (ETO):

The ETO provides legal recognition for electronic transactions and signatures, forming a foundational framework for e-commerce but needs updates to address evolving cyber threats and technological advancements.

The Payment System & Electronic Funds Transfer Act 2007 (PS&EF Act):

The PS&EF Act governs digital payments and sets a regulatory framework for electronic funds transfers but is limited by consumers' reliance on cash-on-delivery (COD), indicating a need for stronger implementation to build trust in digital transactions.

The Prevention of Electronic Crimes Act 2016 (PECA):

PECA aims to protect personal data and ensure confidentiality in electronic transactions but requires stronger enforcement mechanisms and enhanced cybersecurity infrastructure. Consumer protection laws in Pakistan are fragmented and outdated, focusing more on product safety than online transaction security. They lack comprehensive measures for digital contracts, electronic signatures, and cross-border transactions, leading to a trust deficit.

The Personal Data Protection Bill 2023:

This bill aims to safeguard privacy with strict data protection regulations, which are crucial for building consumer trust and ensuring data security.

The E-Safety Bill 2023:

The E-Safety Bill addresses online harassment and cyberbullying by establishing an E-Safety Authority but faces criticism for potentially increasing business costs and limiting access to global digital services due to stringent data localization requirements. Concerns about freedom of expression and privacy have also been raised. Strengthening these laws and enforcement mechanisms is crucial for the growth of Pakistan's e-commerce industry.

E-Commerce Related Institutions in the Country

National and Provincial E-Commerce Councils

- Implement e-commerce policy.
- Coordinate with provincial councils to implement initiatives.

Ministry of Commerce

- Responsible for formulating policies to promote e-commerce.
- Works on trade regulations and policies that impact e-commerce businesses.

Federal Board of Revenue (FBR)

- Oversees taxation policies and customs regulations related to e-commerce.
- Implements and monitors tax collection from e-commerce transactions.

State Bank of Pakistan (SBP)

- Regulates payment systems and digital financial services.
- Ensures secure online payment infrastructure and promotes financial inclusion.

Pakistan Telecommunication Authority (PTA)

- Regulates telecommunications and internet services.
- Ensures availability and quality of internet services, which are crucial for e-commerce.

Ministry of Information Technology and Telecommunication (MoITT)

- Develops IT policies and initiatives to support digital infrastructure.
- Promotes digital literacy and cybersecurity measures.

Competition Commission of Pakistan (CCP)

- Ensures fair competition within the e-commerce market.
- Prevents anti-competitive practices and promotes consumer protection.

Pakistan Software Export Board (PSEB)

- Promotes IT and IT-enabled services (ITeS), including e-commerce.

- Supports software development and export initiatives related to e-commerce platforms.

Pakistan Post

- Provides logistics and delivery services for e-commerce.
- Enhances the reach and efficiency of e-commerce through postal services.

National Tariff Commission (NTC)

- Handles issues related to tariffs and trade policies that affect e-commerce.
- Works on tariff rationalization to facilitate e-commerce growth.

Small and Medium Enterprises Development Authority (SMEDA)

- Supports SMEs in leveraging e-commerce platforms.
- Provides training, resources, and infrastructure support to small businesses.

Provincial Revenue Authorities

- Implement and monitor provincial tax policies related to e-commerce.
- Ensure compliance with regional tax regulations for e-commerce businesses.

SWOT Analysis of E-Commerce Related Institutions in the Country

Strengths:

- A single window for policy oversight enhances coordination and efficiency.
- Significant private sector involvement ensures diverse perspectives and relevance.
- Aims to provide strategic direction and foster coordination.
- Implementation of the Payment Systems and Electronic Fund Transfers Act ensures secure transactions.
- The National Financial Inclusion Strategy (NFIS) expands access to digital financial services.
- The launch of Raast enhances digital payment infrastructure.
- Digital platforms streamline tax processes.
- Tax incentives and simplified tax return processes support e-commerce growth.

Weaknesses:

- Inconsistent meeting frequency of E-commerce Councils hinders timely policy implementation and adjustments.
- Slow progress with inconsistent policy implementation across provinces.
- Fragmented regulations and logistical inefficiencies.
- Persistent cybersecurity concerns.

- Lack of coordination with provincial boards leads to inconsistencies in tax collection and enforcement.
- Bureaucratic inefficiencies and technological gaps impede progress.
- Inefficiencies in the legal process and lack of consumer awareness hinder Consumer Court performance.
- No updates to the national consumer act for specific e-commerce provisions.

Opportunities:

- Potential establishment of a National E-Commerce Authority (NECA).
- Enhancements in business registration and participation in international marketplaces can boost growth.
- Closer collaboration with federal authorities.
- Increased investment in digital infrastructure and capacity-building programs.
- Expansion of digital financial services to underserved populations.
- Continuous technological advancements in digital payment infrastructure.
- Enhanced inter-provincial cooperation and adoption of uniform tax regulations.
- Utilization of advanced digital tools for integrated tax data and enforcement mechanisms.
- Streamlining legal processes and educating consumers.
- Stronger enforcement of regulations can better protect consumers.

Threats:

- Potential bureaucratic inertia and slow policy adjustments, as well as financial constraints.
- Coordination issues between provincial and federal levels.
- Inconsistent policies across provinces create confusion and inefficiencies.
- Digital literacy challenges may slow adoption rates.
- Disparate compliance standards across provinces.
- Cross-border e-commerce complexities may lead to revenue losses from untaxed goods.
- Online fraud and quality issues with e-commerce platforms exacerbate grievances.
- Legal inefficiencies and outdated laws hinder consumer protection.

Critical Analysis of Enhancing E-Commerce for Economic Development in Pakistan

E-commerce in Pakistan holds significant potential for driving economic development but faces multiple challenges that need to be addressed. Domestically, the sector is hindered by inadequate infrastructure and logistics, with only 20% of the population having reliable access to logistics

services. This leads to delays and inefficiencies, as reflected in Pakistan's low logistics performance index (LPI) score of 2.42, ranking 122nd out of 160 countries.

Cash-on-delivery (COD) is the dominant payment method, accounting for 80% of transactions, creating cash flow issues and increasing fraud risks. Despite the State Bank of Pakistan's (SBP) efforts to promote digital payments through the Raast system, adoption remains low due to security concerns, with 74% of respondents in a PTA survey citing these as a major barrier. Inconsistent enforcement of consumer protection laws, as highlighted by the Consumer Protection Act and the low resolution rate of consumer complaints, further undermines consumer trust.

Internationally, high shipping costs, complex customs procedures, and regulatory barriers limit Pakistan's e-commerce competitiveness. The World Bank's Ease of Doing Business Report (2023) ranks Pakistan 136th out of 190 countries, with significant challenges in the "Trading Across Borders" category, ranked 111th. Limited internet penetration, especially in rural areas, restricts e-commerce reach, with only 49% of the population having access to broadband internet. The Digital Pakistan Initiative has made progress, but rural areas lag behind.

Local e-commerce businesses struggle against international competitors due to a lack of scale and technological advancement, with only 30% utilizing advanced technologies like AI and data analytics. High shipping costs, which are 20-30% higher than regional competitors, also hinder international competitiveness.

The E-commerce Policy of 2019 aims to address these challenges but faces implementation issues. The Personal Data Protection Bill 2020 has been slow to pass and lacks strong enforcement mechanisms. Taxation remains problematic due to inconsistent provincial laws, complicating compliance for businesses. The Competition Commission of Pakistan (CCP) is limited by resource constraints, affecting its ability to regulate unfair practices effectively.

Cybersecurity is another critical issue, with a 35% increase in incidents reported by the PTA in 2020, highlighting the need for robust measures. Institutions like the SBP, MoITT, and PTA play crucial roles in supporting e-commerce. The Raast payment system aims to improve digital payments, and the Digital Pakistan Initiative focuses on digital infrastructure and literacy. However, internet speeds and affordability remain issues, with Pakistan ranking 150th globally in average internet speed and 76th in affordability.

The Trade Development Authority of Pakistan (TDAP) supports e-commerce exports but is limited by funding and execution challenges. Freelancing contributes significantly to economic development, earning approximately \$400 million in 2022-2023, but faces regulatory challenges and technological gaps.

Freelancing is a key component of Pakistan's e-commerce, contributing significantly to economic development. Freelancers earned approximately \$400 million in 2022-2023, boosting the economy through foreign exchange and job creation. Growth is supported by digital infrastructure improvements and the Raast payment system, which has reduced transaction costs by 50% and improved reliability. However, the absence of platforms like PayPal complicates international payments, limiting freelancers' potential.

The regulatory environment is underdeveloped, with inconsistencies in provincial tax laws creating compliance issues. Punjab's tax rate on digital services is 16%, while Sindh's is 13%, causing confusion and higher costs. This discourages business formalization. Additionally, only 30% of Pakistani freelancers use advanced technologies like AI and data analytics, compared to 70% in advanced markets, highlighting the need for targeted skill development programs.

Pakistan's e-commerce sector faces significant challenges, including inadequate infrastructure and logistics, reliance on cash payments, inconsistent consumer protection law enforcement, regulatory barriers, high shipping costs, limited internet penetration, and technological disparities. Addressing these challenges requires coordinated efforts from government institutions, regulatory bodies, and private sector stakeholders. Key steps include enhancing digital infrastructure, promoting secure online payment systems, consistently enforcing consumer protection laws, and reducing regulatory and logistical barriers. Additionally, fostering technological adoption and innovation among local businesses, improving digital literacy, and expanding internet access, especially in rural areas, are essential. These measures can help Pakistan's e-commerce sector significantly contribute to economic development.

PESTEL Analysis of Enhancing E-Commerce for Economic Development in Pakistan

Political Factors:

- **Regulatory Environment:** The e-commerce sector in Pakistan is hindered by inconsistent enforcement of consumer protection laws and regulatory barriers. The Consumer Protection Act is not uniformly enforced, leading to consumer hesitancy in adopting online shopping.

- **Government Initiatives:** The government has introduced policies such as the E-commerce Policy of 2019 and the Personal Data Protection Bill 2020 to address regulatory challenges, but their implementation has been slow and inconsistent.
- **Taxation Policies:** The Federal Board of Revenue (FBR) has introduced measures to tax e-commerce transactions, but discrepancies in provincial tax laws create compliance issues and an uneven playing field for businesses.

Economic Factors:

- **Logistics and Infrastructure:** Inadequate infrastructure and logistics are major barriers to the efficient operation of e-commerce businesses. Only 20% of the population has reliable access to logistics services, leading to delays and inefficiencies.
- **Payment Systems:** The dominance of cash-on-delivery (COD) as the primary payment method creates cash flow issues and increases the risk of fraud. Efforts by the State Bank of Pakistan (SBP) to promote digital payments through initiatives like the Raast payment system have seen limited adoption.
- **Shipping Costs:** High shipping costs due to inefficient port operations and high handling charges make it difficult for Pakistani e-commerce businesses to compete internationally.

Social Factors:

- **Consumer Trust:** Security concerns and inconsistent enforcement of consumer protection laws undermine consumer trust in online payments and e-commerce.
- **Digital Divide:** Limited internet penetration, especially in rural areas, restricts the reach of e-commerce. Only 49% of the population had access to broadband internet in 2021, with rural penetration significantly lower at around 35%.
- **Freelancing and Employment:** Freelancing has become a significant component of Pakistan's e-commerce landscape, contributing to economic development through foreign exchange earnings and employment generation.

Technological Factors:

- **Technological Adoption:** Local e-commerce businesses struggle to compete with international giants due to a lack of technological advancement. Only 30% of Pakistani e-commerce firms utilize advanced technologies such as artificial intelligence and data analytics.

- **Digital Infrastructure:** The Digital Pakistan Initiative aims to enhance digital infrastructure and literacy, but its impact has been slow and uneven, particularly in rural areas.
- **Cybersecurity:** Increasing cybersecurity incidents highlight the need for robust measures to protect online transactions. Current regulatory measures are not sufficiently comprehensive to address growing threats to data security and consumer privacy.

Environmental Factors:

- **Sustainability Practices:** Although not explicitly mentioned, improving logistics and infrastructure could contribute to more sustainable practices in the e-commerce sector.
- **Impact of Logistics:** Inefficient logistics and high shipping costs not only affect economic performance but also have environmental implications, such as increased carbon emissions due to longer delivery times and less efficient transportation networks.

Legal Factors:

- **Consumer Protection Laws:** The inconsistent enforcement of consumer protection laws leads to significant consumer hesitancy in adopting online shopping. The low number of consumer complaints resolved highlights this issue.
- **Data Protection Laws:** The slow implementation of the Personal Data Protection Bill 2020 indicates a need for more robust legal frameworks to safeguard consumer data and build trust in online transactions.
- **Competition Regulation:** The effectiveness of the Competition Commission of Pakistan (CCP) is limited by resource constraints and bureaucratic hurdles, contributing to a lack of consumer confidence in the regulatory framework.

Key Findings, Challenges, and Issues

Regulatory and Facilitation Environment

- Lack of detailed plans for updating outdated laws and insufficient specific action items for implementation.

Financial Inclusion and Digitization

- Barriers to digital payments, such as access to financial products, transaction costs, and trust issues, remain unaddressed.

SMEs and Youth Empowerment

- No detailed plans for funding and executing initiatives for SMEs.

Consumer Protection & Developing Consumer Trust

- No clear dispute resolution mechanism.
- Existing consumer protection laws are fragmented and not fully equipped to handle e-commerce complexities.

Taxation Structure

- Discrepancies in provincial tax laws create compliance issues and an uneven playing field for businesses.
- No clear direction or specific plans for addressing e-commerce taxation issues.

ICT Infrastructure and Telecom Services

- Digital inclusion barriers such as connectivity, affordable devices, and digital literacy are inadequately addressed.
- No strategy for supporting home-grown IT solutions for e-commerce or enhancing local cloud services.

Logistics

- Poor logistics performance and insufficient focus on improving logistics for e-commerce growth.
- Limited attention to issues in peri-urban and rural areas, and the affordability, traceability, and reliability of logistics services.

Data Protection and Investment

- Lack of detailed discussion on data protection adequacy and specific areas to be considered in Pakistan's Cloud Policy.
- Insufficient insights into the proposed Data Protection Act and existing data issues.

Provincial Challenges

- Inconsistent policy implementation across provinces and fragmented regulations.
- Logistical inefficiencies, limited financial resources, and bureaucratic hurdles.

E-Commerce Best Practices Around the World

Best Practices in India

Improving Connectivity and Digital Literacy

- **Expansion of Broadband Infrastructure in India:**

India's National Optical Fiber Network (NOFN), now known as BharatNet, aims to connect 250,000 gram panchayats (village councils) with high-speed broadband. The project, funded by the Universal Service Obligation Fund (USOF), is one of the largest rural connectivity programs in the world.

- **Promotion of Affordable Devices in India:**

India has promoted affordable digital devices through initiatives like the "Make in India" campaign, which encourages local manufacturing of electronic devices, reducing costs and increasing accessibility.

- **Digital Literacy Programs in India:**

India's Digital India campaign includes the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), aimed at making 60 million rural households digitally literate. This program focuses on providing basic digital literacy training to one person from each household.

Best Practices for Promoting E-Commerce in China

Robust Payment Systems

- **Alipay and WeChat Pay:**

These platforms provide secure, efficient, and user-friendly payment options, ensuring that consumers' transactions are safe. The integration of these payment systems with e-commerce platforms has been crucial in building trust.

- **Escrow Services:**

Platforms like Alibaba use escrow services, where payments are only released to sellers once the buyer confirms receipt and satisfaction with the product.

Comprehensive Consumer Protection Laws

- **Consumer Rights Protection Law:**

This law includes provisions for returns, refunds, and dispute resolution, which help reassure customers that their rights are protected.

- **Strict Regulation of E-commerce Platforms:**

The Chinese government enforces strict regulations on e-commerce platforms to ensure they comply with consumer protection standards.

Advanced Logistics and Supply Chain

- **Efficient Delivery Services:**

Companies like Cainiao (Alibaba's logistics arm) and JD Logistics provide fast and reliable delivery services, enhancing the overall shopping experience.

- **Return and Refund Policies:**

Clear and customer-friendly return and refund policies help mitigate the risk of unsatisfactory purchases.

Best Practices in America for Sponsorship from the Private Sector for SMEs

In the United States, new startups often receive crucial support from private sector sponsors and investors through venture capital firms like Sequoia Capital and Andreessen Horowitz, which provide both capital and strategic guidance. Additionally, accelerators like Y Combinator and Techstars offer mentorship, funding, and networking opportunities to early-stage companies. Corporate venture arms such as Google Ventures (GV) and Intel Capital also invest in startups, providing access to extensive resources and industry connections. Crowdfunding platforms like Kickstarter and Indiegogo enable startups to raise funds directly from the public, while private equity firms like TPG Capital and The Blackstone Group invest in and support the scaling of promising businesses. Successful examples include Airbnb, which grew with seed funding from Y Combinator and further investments from venture capital firms, and Uber, which expanded globally with backing from angel investors, venture capital, and private equity firms.

Conclusion

Enhancing e-commerce in Pakistan is essential for driving sustainable economic development. While the sector shows significant potential, it faces several critical challenges, including inadequate infrastructure, a lack of detailed plans for funding and executing initiatives for e-SMEs, discrepancies in provincial tax rates, and inconsistent enforcement of consumer protection laws. By addressing these issues through coordinated government efforts, improving digital infrastructure, enacting a dispute resolution mechanism, funding new startups, and establishing a reliable tax structure, Pakistan can create a more conducive environment for e-commerce. Implementing best practices from countries like India, China, and the US, particularly in improving connectivity, digital literacy, and supporting SMEs, will be crucial. These measures will enable Pakistan to unlock the full potential of its e-commerce sector, contributing significantly to GDP growth, job creation, and entrepreneurship.

Recommendations

Empowering E-Commerce SMEs and Youth

By Providing Loans and Investment from Private Investors

Proposal: a. Providing Interest-Free Loans by Ministry of Commerce

To enhance e-commerce in Pakistan, the Ministry of Commerce will establish a dedicated fund for small and medium enterprises (SMEs) involved in e-commerce, offering interest-free loans to SMEs and new startups. The initiative's key features include providing interest-free loans to financially support SMEs and startups with solid business plans and completed initial groundwork, ensuring that only viable projects receive support. The fund will be managed by a dedicated board under the Ministry of Commerce, comprising successful entrepreneurs who will critically analyze business plans considering Pakistan's specific market conditions. Safeguards and accountability measures, such as a reimbursement clause for business models that fail within the first year and penalties devised in collaboration with the Court of Law and the National e-Commerce Council, will ensure the fund's integrity and encourage serious applicants. The loan application process will be straightforward and accessible, reducing bureaucratic hurdles and encouraging participation. Once businesses become profitable, they will contribute 0.5% to 1% of their profit to the government, creating a sustainable reinvestment cycle into the fund. This initiative will provide essential financial support to SMEs and startups, helping them launch and grow their e-commerce ventures. Expert evaluation by experienced entrepreneurs will ensure that only feasible and well-prepared projects receive funding. Enhanced accountability measures will maintain the fund's integrity, while a simple application process will encourage more SMEs to apply, fostering a

competitive and innovative e-commerce environment. Ultimately, profit sharing will promote sustainable growth in the e-commerce sector.

Proposal: National e-Commerce Council's Private Sector Initiative for Startup Funding

The National e-Commerce Council will introduce a new initiative in the private sector aimed at identifying sponsors and investors to fund and invest in new business startups in Pakistan. This initiative will focus on supporting early-stage startups, often when they are still in the idea or prototype phase. The key features include early-stage investment to provide critical funding for initial expenses such as product development and marketing, ensuring startups receive the necessary capital to launch and grow. Investment models will include equity investment, where investors receive ownership shares in the company, and convertible debt, a loan that can later be converted into equity under specific conditions. Investors will be experienced entrepreneurs or industry experts who will offer valuable mentorship and advice, assisting startups with strategic planning, business development, and operational guidance. These investors will also have extensive industry networks, providing startups with connections to potential customers, partners, suppliers, and additional investors, facilitating business growth and expansion. The benefits for startups include essential financial support to cover early-stage expenses, mentorship and guidance from seasoned entrepreneurs and industry experts, networking opportunities through investors' connections, and enhanced credibility from receiving investment and mentorship from reputable investors, making it easier to attract further investment and market interest.

Youth Empowerment Programs:

Develop skill development programs in provinces, such as DigiSkills, targeting young entrepreneurs in e-commerce, focusing on technology adoption, digital marketing, and business management.

Consumer Protection and Developing Consumer Trust

Establish a clear, accessible dispute resolution mechanism specifically for e-commerce transactions. This could include online mediation services and a dedicated helpline for consumer complaints. The mechanism is formulated as follows:

Dispute Resolution Mechanism:

To ensure that customer-related issues are handled efficiently and fairly, companies in Pakistan will implement a robust dispute resolution mechanism initiated by the Ministry of Commerce and devised by the Ministry of Law. The Pakistan e-Commerce Council will ensure the implementation of this model, which incorporates several key stages. The first stage involves online mediation, facilitated through the company's Complaint Center, where buyers and sellers submit their disputes. The company acts as an intermediary, helping both parties reach a resolution through negotiation and mediation, aiming to achieve a mutually agreeable solution. If mediation does not resolve the dispute, the process moves to decision-making, where the company evaluates the evidence and testimonies from both parties and makes a decision based on the company's Transaction Dispute Rules. This can include remedies such as refunds, partial refunds, returns, or compensation for losses. Ensuring the enforcement of these decisions involves the company facilitating refunds or compensation, with guarantees provided through the Dispute Resolution Mechanism. An additional layer of fairness and transparency is provided through appeals and arbitration. If either party is dissatisfied with the mediation decision, they can escalate the issue to the Board specialized in handling complaints through an online system at the Ministry of Commerce, which ensures a fair and transparent resolution process. If dissatisfaction remains with the decision of the Board, the case may be taken to consumer courts. This multi-tiered approach aims to provide a comprehensive and fair dispute resolution mechanism for customer-related issues.

Strengthening Consumer Protection Laws

The National E-commerce Consumer Council is ensuring that national and provincial consumer acts are amended at both the provincial and federal levels to better support e-commerce. Amendments will include specific definitions and regulations for e-commerce transactions, such as digital contracts, electronic signatures, online dispute resolution, and mechanisms for addressing digital fraud and cyber theft. Enhancing regulatory oversight for e-commerce platforms to ensure transparency in services and return policies is crucial. The Act will address jurisdictional challenges and implement a standardized consumer protection framework across provinces, including punishments for non-compliance with dispute resolution decisions and consumer education initiatives. These amendments would increase consumer confidence, promote e-commerce growth, and protect consumer rights in the digital marketplace.

Improving Taxation Structure

Harmonizing Tax Laws:

In Pakistan, provincial taxation on services varies, with Punjab imposing rates from 4% to 16%, Sindh taxing most services at 13%, and telecommunications at 19.5%, and Khyber Pakhtunkhwa and Balochistan generally at 15%. To harmonize these taxes, a committee under the National E-commerce Council will be formed, including federal and provincial representatives and e-commerce stakeholders, to review and propose unified tax rates and procedures. This committee will develop a comprehensive e-commerce taxation strategy, standardize input tax adjustment rules, and ensure compliance guidance. National and provincial councils will put the committee's recommendations before the Federal and Provincial Boards of Revenue for review. After review, the Ministry of Finance will lay the Finance Act before the Assembly. Upon approval, it will be implemented across the country. It will align tax rates and rules, simplifying compliance, reducing administrative burdens, lowering costs, and attracting investment to foster e-commerce growth and innovation.

Reduced Tax Rates and Exemptions:

- **Goods and Services Tax (GST) Reductions:** Similar to India's reduction in GST for certain digital services, Pakistan can reduce GST rates for e-commerce transactions. This will make online goods and services more affordable for consumers and encourage more businesses to transition online.
- **Income Tax Exemptions for Startups:** India offers income tax exemptions for startups under the Startup India initiative. Pakistan can implement a similar policy, providing tax holidays for new e-commerce startups for their initial years of operation.
- **Incentives for Digital Payments:**
 - **Cashback and Rebates:** In India, digital payment incentives, such as cashbacks for using digital payment methods, have been successful. Pakistan can introduce similar incentives to promote cashless transactions, which would help increase transparency and ease of tax collection.
 - **Subsidies for Payment Gateway Integration:** Offering financial support for SMEs to integrate secure payment gateways can lower the barrier to entry for small businesses looking to operate online.

Expansion of Broadband Infrastructure

Expansion of Broadband Infrastructure:

To expand broadband infrastructure in Pakistan, a National Broadband Plan will be established, led by the Ministry of Information Technology and Telecommunication (MoITT) in collaboration with the Pakistan Telecommunication Authority (PTA). Core infrastructure providers like PTCL and Transworld Associates will handle backhaul connectivity, while Nayatel, StormFiber, and WorldCall will manage local implementation for last-mile connectivity. Financing will involve the Universal Service Fund (USF) to support infrastructure expansion, drawing inspiration from India's USOF, and encourage public-private partnerships (PPPs) between the government and private sector providers. Regulatory support will include streamlined approvals to simplify the right-of-way (RoW) processes, alongside financial incentives and subsidies for providers expanding into rural areas. The deployment strategy will be executed in phases: Phase I will connect major rural hubs and district headquarters with fiber optic cables, Phase II will extend connectivity to smaller towns and villages, and Phase III will achieve full coverage by connecting all inhabited areas. The deployment will employ a mix of fiber optic and wireless technologies to ensure cost-effective and rapid implementation.

Digital Literacy Programs:

A National Digital Literacy Mission will be launched to enhance digital literacy in Pakistan, focusing on basic digital skills for rural and underserved populations through community-based training centers, integration into school curriculums, and online platforms offering free courses in local languages. Led by the Ministry of Information Technology and Telecommunication (MoITT) with oversight from the Pakistan Telecommunication Authority (PTA) and financial support from the Universal Service Fund (USF), the mission will reach students, teachers, and farmers, ensuring digital literacy initiatives promote inclusivity. Collaboration with private sector players, telecom operators, and NGOs will be essential for establishing training infrastructure and providing digital tools. Special programs for women and young entrepreneurs will further ensure that these groups have access to the resources needed to participate in the digital economy.

Promotion of Affordable Devices:

To promote affordable digital devices in Pakistan, the government will incentivize local manufacturing by offering tax incentives and subsidies to reduce costs. Programs will be launched to distribute subsidized or free

devices to students and low-income households, ensuring broader access to digital tools. Additionally, partnerships with international and local tech companies will be established to introduce affordable devices into the market.

Improve Data Protection

Ensuring data protection adequacy for e-commerce in Pakistan is essential for consumer trust, international compliance, and economic development. The mechanism involves adopting a comprehensive data protection law by expediting the Personal Data Protection Bill 2021 and clearly defining key terms and principles. An independent Data Protection Authority (DPA) should be established to enforce laws, monitor compliance, handle breaches, and impose penalties, supported by training programs. Robust provisions for data subject rights should allow individuals to access, correct, and delete their data, with public awareness campaigns to educate them. Clear regulations for cross-border data transfers and data localization requirements for sensitive personal data should ensure that it is stored and processed within Pakistan.

Overcoming Provincial Challenges

Coordinated Policy Implementation: Ensure consistent policy implementation across provinces by establishing a central coordination body. The National E-commerce Council should oversee and align provincial regulations, reducing fragmentation and inefficiencies.

By implementing these recommendations, Pakistan can create a more conducive environment for e-commerce, addressing current challenges and unlocking the sector's full potential for economic development.

Improving Logistics

Enhancing Logistics Performance:

Implement initiatives to improve logistics infrastructure, focusing on peri-urban and rural areas. Encourage public-private partnerships to enhance the affordability, traceability, and reliability of logistics services. Pakistan can learn lessons from China Post and invest in Pakistan Post through public-private partnerships for efficient and affordable shipment handling for international e-commerce.

Implementation of E-commerce Policy

The e-commerce policy provides a comprehensive framework for developing e-commerce in Pakistan, requiring thorough implementation by the Ministry of Commerce and active roles for the National and Provincial E-commerce Councils. The National E-commerce Council should focus on creating a

robust regulatory environment for consumer protection, data security, and fair trade, while collaborating with stakeholders to streamline processes and promote best practices. Provincial e-Commerce Councils should address region-specific challenges by improving local digital infrastructure, providing resources and training to SMEs, and ensuring that e-commerce benefits reach remote areas, fostering a competitive and innovative e-commerce ecosystem nationwide.

Log frame work for SMEs and youth empowerment

1. Strategy: Empowering E-Commerce SMEs and Youth			
Action	KPIs	Executing Agency	Period
Goal 1: Providing Loans and investment by National E-commerce council:			
Introduction of Provision of interest free loans to new e-SMEs	Decision by all e-Commerce Councils to provide interest free loans	National e-Commerce Council & Provincial e-Commerce Council	Medium Term
Decision to be laid before federal and Provincial Cabinets	Agreement by all Cabinets	Federal Cabinet Provincial Cabinet	
Creation of Board under Ministry of Commerce	Board comprising of members from federal and provincial governments, private sector entrepreneurs Board will be responsible for scrutinizing the loan applications, look for viability of the project	Approval by the federal and provincial governments	
Making contours of the provision of loan	Decision of the process of loan Conditions of loan Decision on %age of profit on successful running of business	Ministry of Commerce, Ministry of Finance Board	
Decision on Creation of Universal e-Commerce Fund	Agreement by all provinces	National and Provincial e-Commerce Councils, al and	

under National e-commerce council		Provincial Cabinets	
Provision of funds for the Fund	Arrangement of funds from Ministry of Finance	Ministry of Commerce Board	
Advertising the initiative	Making awareness through by involving NGOs and Banks and government broadcasting ministry	Ministry of Commerce & Board	
1. Strategy: Empowering E-Commerce SMEs and Youth			
Action	KPIs	Executing Agency	Period
Goal 1: National e-Commerce Council's Private Sector Initiative for Startup Funding			
Introduction of creation of pool of sponsors and investors for investment in new e-SMEs and start-ups	Decision by all e-Commerce Councils to provide interest free loans	National e-Commerce Council & Provincial e-Commerce Council	
Decision to be laid before federal and Provincial Cabinets	Agreement by all Cabinets	Federal Cabinet Provincial Cabinet	
Creation of independent pool of sponsors under Ministry of Commerce	Pool comprising of private sector entrepreneurs, investors, sponsors etc Pool will be responsible for scrutinizing the loan applications, look for viability of the project and make decision for investment, sponsor	Approval by the federal and provincial governments	
Making contours of the provision of loan	Decision of the process of loan Conditions of investments	Ministry of Commerce, Ministry of Finance Pool of sponsors	Medium Term

	Decision on equity or loan type facilitation Decision on %age of profit on successful running of e-SME		
Advertising the initiative	Making awareness through by involving NGOs and Banks and government broadcasting ministry, private channels	Ministry of Commerce & Board	
2. Strategy: Consumer Protection and Developing Consumer Trust			
Action	KPIs	Executing Agency	Period
a. Goal 1: Dispute Resolution Mechanism			
Introduction of adoption of dispute resolution mechanism by all e-commerce businesses	Decision by all e-Commerce Councils	National e-Commerce Council & Provincial e-Commerce Council	Short Term
Decision to be laid before federal and Provincial Cabinets	Agreement by all Cabinets	Federal Cabinet Provincial Cabinet	
Initiation of the process for evolving the mechanism	Developing a dispute resolution mechanism Involvement of all stakeholder Involvement of representatives from private sector Looking for the best dispute resolution mechanisms	Ministry of Law and Justice	
Agreement on mechanism	Approval by federal and provincial cabinets	Federal & provincial Cabinets	
Implementation of Mechanism	All e-commerce businesses to implement the mechanism approved by the Cabinets	Ministry of Commerce, Federal & Provincial Councils	

Advertising the initiative	Making awareness through by involving NGOs and Banks and government broadcasting ministry, private channels	Ministry of Commerce & Board	
Monitoring the implementation of mechanism	All the e-business to implement the mechanism without any delay within six months of approval from the cabinet	Ministry of Commerce and Federal & Provincial Councils	
2. Strategy: Consumer Protection and Developing Consumer Trust			
Action	KPIs	Executing Agency	Period
b. Goal 2: Strengthening Consumer Protection Laws			
Introduction of strengthening Consumer Act	Decision by all e-Commerce Councils	National e-Commerce Council & Provincial e-Commerce Council	Medium Term
Decision to laid before federal and Provincial Cabinets	Agreement by all Cabinets	Federal Cabinet Provincial Cabinet	
Initiation of the process for evolving changes to make consumer complaint resolution an easy process and inclusion of e-commerce related laws	Developing contours of the changes and new inclusions Involvement of all stakeholder Involvement of representatives from private sector Looking for easy complaint handling processes and inclusion of dispute resolution mechanism in the Act	Ministry of Law and Justice, law departments of the provinces	
Agreement on Act	Approval by federal and provincial cabinets	Federal & provincial Cabinets	

Approval of the Act	Laying of Act before National & Provincial Assemblies	National & Provincial Assemblies	
3. Strategy: Improving Taxation Structure			
Action	KPIs	Executing Agency	Period
a. Goal 1: Harmonize tax laws for e-commerce			
Introducing harmonized tax regime for e-Commerce businesses	Decision by all e-Commerce Councils to provide interest free loans	National e-Commerce Council & Provincial e-Commerce Council	Long Term
Decision to be laid before federal and Provincial Cabinets	Agreement by all Cabinets	Federal Cabinet Provincial Cabinet	
Proposal to the Boards of Revenue	Boards will formulate their recommendations	Federal & Provincial Boards of Revenue	
Making provision for the Finance Act	Keeping in view the recommendations given by the Boards, formulate a single tax figure for e-commerce related businesses	Ministry of Finance	
Agreement on the Provisions introduced by the Ministry of Finance	Agreement by all provinces	National and Provincial e-Commerce Councils, al and Provincial Cabinets	
Laying before the National Assembly	Pass the finance Act by the Parliament when its in session	National Assembly of Pakistan	
Implementation of the Act	The Act needs to be implemented in federal territory and all the provinces	Fe Deral and Provincial Boards	
1. Strategy: Expansion of Broadband Infrastructure			
Action	KPIs	Executing Agency	Period
Goal 1: Expand broadband infrastructure in Pakistan			

Establishing National Broadband Plan	Identifying the need for National Broadband Plan	Ministry of Information Technology and Telecommunication (MoITT) , Pakistan Telecommunication Authority (PTA)	Long Term
Taking Provinces on board about the initiative	The Provincial Cabinets will be briefed about the initiative	Provincial e-Commerce Councils	
Taking core infrastructure providers on Board	Core infrastructure providers will look into their potential of implementing such a robust plan They will do surveys to identify the gaps and requirements	Ministry of Information Technology and Telecommunication (MoITT) , Pakistan Telecommunication Authority (PTA) PTCL Transworld Associates	
Taking private sector providers on Board	The private sector providers will also give their input and will join with the core providers in surveys etc	Ministry of Information Technology and Telecommunication (MoITT) , Pakistan Telecommunication Authority (PTA)	
Identification of the requirements and planning	On the basis of surveys PC-1 will be prepared	Ministry of Information Technology and Telecommunication (MoITT) ,	

		Pakistan Telecommunication Authority (PTA)	
Arrangements of funds		National Assembly of Pakistan	
Implementation of the Act	The Act needs to be implemented in federal territory and all the provinces	Fe Deral and Provincial Boards	

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Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, and Precision Agriculture

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Abstract:

The agriculture sector in Pakistan is a cornerstone of the economy, yet its productivity and sustainability are undermined by traditional farming practices, limited mechanization, and environmental challenges. This study highlights the sector's current state, emphasizing the need for mechanization to boost yields, promote crop diversification, and adopt precision agriculture. Key challenges include limited access to modern technology, policy barriers, and socio-economic constraints. The paper explores strategies such as increasing access to machinery, farmer training, and supportive policies to drive mechanization. Emerging technologies like precision agriculture hold transformative potential for farming practices in Pakistan. The study stresses the importance of public-private collaboration, infrastructure investment, and research for sustainable agricultural development. Mechanization is presented as a critical pathway to enhancing productivity, improving livelihoods, and ensuring food security for Pakistan's growing population.

Key words:

Agriculture, mechanization, precision agriculture, food security, Pakistan

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Introduction

Agriculture is the backbone of Pakistan's economy, employing a significant portion of the population and contributing substantially to the country's GDP. However, traditional farming practices and limited access to modern technology have constrained the sector's productivity and resilience. In an era of rapidly advancing agricultural innovations and increasing challenges such as climate change and food security, there is an urgent need to transform Pakistan's agriculture sector.

Mechanizing the agriculture sector offers a pathway to higher yields, greater crop diversification, and the adoption of precision agriculture. By integrating modern machinery, equipment, and cutting-edge technologies into farming practices (Andreoni et al., 2021), Pakistan can enhance the efficiency, sustainability, and profitability of its agriculture. This transformation promises not only to boost crop yields and reduce labor costs but also to facilitate innovative farming practices adaptable to diverse agro-climatic conditions.

By fostering public-private collaboration, implementing supportive policies, and investing in research and development, Pakistan can create an enabling environment for agricultural mechanization. This holistic approach will empower farmers, improve livelihoods, and ensure national food security. As Pakistan embarks on this transformative journey, it stands to gain from increased agricultural output as well as a more sustainable and resilient agricultural system (Uitto et al., 2017).

Problem Statement

Despite being a vital component of Pakistan's economy, the agriculture sector faces numerous challenges that hinder its productivity, sustainability, and competitiveness. Traditional farming practices, limited access to modern technology, and inadequate infrastructure contribute to low crop yields, restricted crop diversification, and inefficiencies in resource management. Therefore, there is a dire need to address these challenges through concerted efforts to promote mechanization, crop diversification, and precision agriculture in Pakistan. By overcoming these barriers, the agriculture sector can unlock its full potential, increase productivity, enhance resilience to climate change, and ensure food security for the nation's growing population.

Scope of Study:

- To assess the current state of agricultural mechanization in Pakistan policies and initiatives.
- To Analyse the existing legal and institutional frame work for federal and provincial government develop over time.
- To analyze Pakistan agriculture sector initiatives and comparison with best practices in the world.
- To analyse challenges and recommend policy measures and strategies for promoting mechanization and precision agriculture at federal, provincial, and district levels through log matrix frame work.

Research methodology

The study adopts a mixed-methods design, combining qualitative and quantitative approaches to gather a holistic understanding of the current state and potential of agricultural mechanization and precision agriculture in Pakistan. The research has applied following analysis:

1. Literature Review & Situational Analysis
2. SWOT Analysis
3. GAP Analysis
4. PESTEL Analysis & Policy Analysis and Recommendation

Situational Analysis of Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, And Precision Agriculture: Current State of Agriculture:

Traditional Farming Practices:

Pakistan's agriculture sector predominantly relies on traditional farming methods, characterized by manual labor, rudimentary tools, and limited mechanization. The use of modern machinery and equipment remains low, particularly among small landholding farmers.

Crop Yield Challenges:

Despite favorable agro-climatic conditions, crop yields in Pakistan often fall below their potential due to inefficient farming practices, limited access to quality inputs, and inadequate crop management techniques. Monocropping of staple crops like wheat and rice further limits agricultural diversity and resilience (Shah et al., n.d.).

Resource Management Issues:

Inefficient use of water, fertilizers, and pesticides leads to environmental degradation and diminishes the sustainability of agricultural production. Poor

irrigation practices, soil erosion, and water scarcity exacerbate these challenges, particularly in arid and semi-arid regions (Horrihan et al., 2002).

Limited Crop Diversification:

The agriculture sector is characterized by a lack of crop diversification, with a few staple crops dominating cultivation. This monocropping pattern increases the sector's vulnerability to pests, diseases, and climate variability, posing risks to food security and farmer livelihoods.

Technological Landscape

Low Mechanization Levels:

The adoption of modern agricultural machinery and equipment is limited, particularly among small landholding farmers who lack access to affordable and appropriate technologies. Tractors, harvesters, and irrigation systems are underutilized, leading to labor inefficiencies and low productivity (Sims & Kienzle, 2017).

Emerging Precision Agriculture Technologies:

While precision agriculture technologies such as GPS-guided systems, drones, and sensor-based monitoring are available, their adoption remains limited due to high initial costs, lack of awareness, and technical capacity constraints.

Policy and Regulatory Environment

Policy Fragmentation:

The agriculture sector is governed by a complex regulatory framework characterized by overlapping jurisdictions and fragmented policies. Inconsistent land tenure arrangements, import tariffs on agricultural machinery, and limited financial incentives for mechanization impede progress toward agricultural modernization.

Supportive Initiatives:

Despite challenges, the government has initiated several programs and policies to promote mechanization, crop diversification, and precision agriculture. However, the implementation of these initiatives often faces challenges related to funding constraints, capacity limitations, and coordination issues.

Socio-Economic Factors

Rural Livelihoods:

Agriculture remains the primary source of livelihood for a significant portion of Pakistan's rural population, particularly small farmers. Enhancing agricultural productivity and income opportunities is crucial for poverty reduction and rural development (Sharma et al., 2019).

Gender Dynamics:

Women play a significant role in agricultural production and post-harvest activities in Pakistan. However, they often face gender-specific constraints such as

limited access to land, financial resources, and agricultural extension services, which impact their participation in mechanization and technology adoption (Asian Development Bank, 2021).

Environmental Considerations

Climate Vulnerability:

Pakistan's agriculture sector is highly vulnerable to climate change impacts, including erratic weather patterns, droughts, floods, and temperature extremes. Climate-smart agriculture practices, including mechanization and precision agriculture, are essential for building resilience and mitigating risks.

Natural Resource Degradation:

Unsustainable agricultural practices contribute to soil erosion, water pollution, and biodiversity loss. Adopting mechanized and precision agriculture techniques can help minimize environmental degradation and promote sustainable resource management (Rana, 2023).

Legal and Institutional Framework Analysis

The development of the agriculture sector involves collaboration between the Federal and provincial governments. Key aspects include:

1. **Constitutional Distribution of Powers:**

Agriculture falls under both Federal and provincial jurisdictions. While the Federal government focuses on national policies, provinces handle implementation and regulation (Government of Pakistan, n.d.).

2. **Federal Laws and Policies:**

The Federal government has enacted laws and policies such as the Pakistan Agriculture Research Council Act, Seed Act, and National Agriculture Policy to regulate and promote agriculture.

3. **Institutions:**

Federal institutions like the Ministry of National Food Security and Research (MNFSR) and the Pakistan Agricultural Research Council (PARC) play pivotal roles in policy-making and research (PASSCO, n.d.).

4. **Provincial Departments and Policies:**

Provinces have tailored laws and institutions, such as the Punjab, KP, and Sindh Agriculture Departments, focusing on their unique agricultural needs.

5. **Coordination Mechanisms:**

Mechanisms like the Council of Common Interests (CCI) facilitate Federal-provincial collaboration on cross-cutting agricultural issues.

6. **Challenges and Reforms:**

Efforts to address challenges such as water scarcity and low productivity include reforms like the Kissan Cards scheme and the Prime Minister's Agriculture Emergency Program.

Comparing Pakistan's Agricultural Practices to Global Best Practices

1. **Technology Adoption:**

Countries like the U.S. and Israel excel in integrating precision agriculture, while Pakistan still lags in widespread adoption (Jat et al., 2011).

2. **Water Management:**
Innovative practices in Israel and Australia offer lessons for Pakistan, where inefficient irrigation systems prevail.
3. **Research and Development:**
Global leaders prioritize R&D to enhance yields, whereas Pakistan's research initiatives need more funding and collaboration.
4. **Market Access and Value Chains:**
Strong value chains in the Netherlands contrast with Pakistan's weak infrastructure and post-harvest losses (University of Agriculture, Faisalabad, n.d.).
5. **Sustainable Agriculture:**
European nations lead in organic farming and agroforestry. Pakistan requires increased awareness and capacity building to scale such practices.
6. **Farmers' Access to Finance and Insurance:**
Innovative financial products in India and Kenya provide a model for Pakistan to improve financial inclusion and risk management for farmers.

SWOT - ANALYSIS OF PAKISTAN'S MAJOR AGRICULTURE INSTITUTIONS:

SWOT analysis of Pakistan's major institutions responsible for the development of the agriculture sector is as under:

Pakistan Agricultural Research Council (PARC)

Strengths:

- Extensive network of research institutions and centers across the country.
- Mandate to conduct research, develop technologies, and provide technical assistance to farmers.
- Collaborations with international research organizations and universities.
- Strong focus on crop improvement, pest management, and soil conservation.

Weaknesses:

- Limited financial resources and funding constraints affecting research activities.
- Bureaucratic inefficiencies and delays in technology dissemination.
- Insufficient coordination with provincial agriculture departments.
- Dependency on traditional research approaches, with limited emphasis on emerging technologies.

Opportunities:

- Potential for increased funding and partnerships with the private sector and international donors.
- Adoption of modern research methodologies, biotechnology, and precision agriculture.
- Collaboration with universities and industry for the commercialization of research outputs.
- Addressing emerging challenges such as climate change adaptation and sustainable agriculture.

Threats:

- Competition for limited research funding from other sectors.
- Brain drain of talented researchers due to better opportunities abroad.
- Political interference and instability affecting institutional autonomy.
- Resistance to new technologies or genetically modified organisms (GMOs) from certain interest groups.

Provincial Agriculture Departments (e.g., Punjab, KP, & Sindh Agriculture Departments)

Strengths:

- Proximity to farmers and grassroots-level implementation of agricultural policies.
- Extensive network of extension services for technology dissemination and farmer training.
- Knowledge of local agricultural conditions and challenges.
- Coordination with district-level agriculture offices for effective service delivery.

Weaknesses:

- Lack of capacity and resources in terms of trained staff and infrastructure.
- Inconsistent policy implementation and enforcement across districts.
- Limited access to modern farming practices and inputs in remote rural areas.
- Dependency on federal funding and policies, limiting provincial autonomy.

Opportunities:

- Strengthening extension services through digital platforms and mobile technologies.
- Promoting public-private partnerships for agricultural extension and input supply.
- Tailoring agricultural policies and programs to address province-specific challenges.
- Enhancing collaboration with research institutions and universities for technology transfer.

Threats:

- Political interference and nepotism affecting recruitment and promotion within the department.
- Budgetary constraints impacting the delivery of extension services.
- Resistance to change from traditional farming communities or vested interests.
- Competition with other provincial departments for limited resources and attention from policymakers.

Pestle Analysis of The External Factors Influencing the Agriculture Sector in Pakistan:

The PESTLE analysis focuses on the external factors influencing the agriculture sector in Pakistan:

Political Factors:

- Stability and governance issues can affect policy continuity and implementation.
- Political interference may hinder effective decision-making and resource allocation.
- Government policies on subsidies, tariffs, and land tenure impact agricultural production and profitability.

Economic Factors:

- Fluctuations in global commodity prices affect export earnings and farmer incomes.
- Access to credit and agricultural finance is crucial for investment in inputs and technology.
- Exchange rate volatility influences the competitiveness of agricultural exports.

Social Factors:

- Rapid population growth increases food demand, putting pressure on agricultural production.
- Rural-urban migration affects the availability of labor for farming activities.
- Socio-cultural preferences and dietary patterns influence crop choices and market demand.

Technological Factors:

- Adoption of modern technologies like precision agriculture and biotechnology can enhance productivity.
- Access to agricultural machinery and equipment improves efficiency and reduces labor dependency.
- Digital platforms and mobile applications facilitate access to market information and extension services.

Legal Factors:

- Land tenure laws, property rights, and tenancy arrangements impact land use patterns and agricultural productivity.
- Regulatory frameworks governing seed quality, pesticide use, and environmental conservation affect farm practices.
- Trade agreements and tariff policies influence market access and competitiveness.

Environmental Factors:

- Climate change poses risks such as erratic rainfall, temperature extremes, and pest outbreaks.
- Soil degradation, water scarcity, and deforestation threaten long-term agricultural sustainability.
- Adoption of climate-smart agricultural practices is crucial for resilience and adaptation.

GAP Analysis of Agriculture Sector of Pakistan:

GAP analysis of current practices and policies in agriculture sector of Pakistan

Aspect	Current Practices/Policies	Desired Practices/Policies	Gaps Identified	Actions Needed
Farming Techniques	Traditional farming methods.	Modern, mechanized farming techniques.	Reliance on outdated methods.	Training programs for farmers, subsidies for machinery, model farms projects.
Water Management	Inefficient irrigation practices (e.g., flood irrigation).	Efficient water uses through drip and sprinkler systems.	Water wastage and reduced productivity.	Develop infrastructure for modern irrigation, educate farmers on water conservation.
Quality Inputs	Limited access to certified seeds, fertilizers, pesticides.	Universal access to high-quality agricultural inputs.	Low availability of high-quality inputs.	Strengthen supply chains, financial support for to small farmers to purchasing inputs.
Subsidies and Support	Misallocated or insufficient subsidies/support programs.	Efficient and transparent distribution of subsidies/support.	Bureaucratic hurdles, small-scale farmers not benefiting.	Develop transparent mechanisms for subsidy distribution,

				focus on small-scale farmers.
Research & Development	Limited investment in agricultural R&D, weak extension services.	Robust research and extension systems.	Insufficient research, weak knowledge transfer to farmers.	Increase funding for R&D, improve extension services, disseminate research findings.
Market Access	Poor infrastructure, lack of market information.	Well-developed market infrastructure, easy access for farmers.	Difficulty in accessing markets, unfair prices for produce.	Build/upgrade transportation and storage facilities, establish market information systems.
Post-Harvest Handling	Poor post-harvest handling, storage, and transportation.	Effective post-harvest management and infrastructure.	Significant post-harvest losses.	Improve storage and transportation infrastructure, train farmers in post-harvest handling.
Climate Change Adaptation	Inadequate policies for climate resilience.	Comprehensive climate-smart agricultural practices.	Lack of climate-resilient farming policies and practices.	Develop and implement climate-resilient policies, promote sustainable farming practices.

Issues and Challenges

1. **Limited Access to Machinery:** Small farmers in Pakistan often lack access to modern agricultural machinery due to high costs and limited availability. This hinders their ability to mechanize farming operations and achieve higher yields.
2. **Fragmented Land Holdings:** The prevalence of small and fragmented land holdings in Pakistan makes it challenging to adopt mechanization at scale. Machinery designed for large farms may not be suitable or cost-effective for small plots, limiting the uptake of mechanized farming practices.
3. **Technological Awareness and Education:** There is a lack of awareness and technical knowledge among farmers regarding the benefits of mechanization and precision agriculture techniques. Many farmers hesitate to adopt new technologies due to limited understanding and perceived risks.
4. **Infrastructure and Power Supply:** Inadequate rural infrastructure, including roads, electricity, and irrigation facilities, poses significant challenges for mechanizing the agriculture sector. Power outages and unreliable electricity supply hinder the operation of machinery, especially in remote rural areas.
5. **Financial Constraints:** The upfront investment required for purchasing agricultural machinery and equipment is often beyond the financial means of small farmers. Limited access to agricultural credit and financing options further exacerbates this challenge, hindering the adoption of mechanization.
6. **Crop Diversification and Market Demand:** While mechanization can facilitate crop diversification by enabling the cultivation of high-value crops, market demand and price fluctuations present uncertainties for farmers. A lack of market linkages and market information systems can deter farmers from diversifying their crops.
7. **Precision Agriculture Technologies:** The adoption of precision agriculture technologies, such as GPS-guided tractors and drones for crop monitoring, faces challenges related to affordability, technical expertise, and data management. Integrating these technologies into existing farming practices requires investment in training and infrastructure. (Schimmelpfennig & Ebel, 2016)
8. **Water Management and Conservation:** Efficient water management is critical for sustainable agriculture, yet many mechanized farming practices in Pakistan are water-intensive. Adopting precision irrigation systems and water-saving technologies can help address water scarcity issues but requires investment and technical support.
9. **Environmental Concerns:** Intensive mechanized farming practices can have adverse environmental impacts, including soil degradation, water pollution, and loss of biodiversity. Balancing the benefits of mechanization with environmental sustainability requires careful planning and regulatory oversight.
10. **Policy and Regulatory Frameworks:** Inconsistent policies, outdated regulations, and bureaucratic hurdles impede the adoption of mechanization

and precision agriculture in Pakistan. Streamlining regulatory processes, providing incentives for technology adoption, and fostering public-private partnerships can create an enabling environment for innovation in the agriculture sector. (Hameed & Baig, 2016)

Log Frame Matrix for Addressing the Issues and Problems Identified:

Log Frame Matrix for Addressing Issues in Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, and Precision Agriculture in Pakistan:

Overall Goal:

- Increase agricultural productivity, promote crop diversification, and enhance sustainability through mechanization and precision agriculture in Pakistan.

Purpose/Objective:

- Facilitate the adoption of mechanized farming practices, promote crop diversification, and implement precision agriculture techniques among small farmers in Pakistan.

Outputs:

- Increased access to modern agricultural machinery and equipment.
- Improved technical knowledge and awareness among farmers about mechanization and precision agriculture.
- Enhanced infrastructure and support services for mechanized farming.
- Strengthened market linkages and value chains for diversified crops.
- Implementation of precision agriculture technologies for efficient resource management.

Activities:

- Conduct training programs and demonstrations on mechanized farming techniques and precision agriculture.
- Provide subsidies or incentives for the purchase of agricultural machinery and equipment.
- Upgrade rural infrastructure, including roads, electricity, and irrigation facilities.
- Establish farmer cooperatives or machinery-sharing arrangements to increase access to machinery.
- Develop market information systems and facilitate access to markets for diversified crops.
- Pilot precision agriculture technologies in collaboration with research institutions and private-sector partners.

Indicators:

- Percentage increase in the adoption of mechanized farming practices among target farmers.

- Number of farmers trained in mechanization and precision agriculture techniques.
- Improved availability and reliability of rural infrastructure.
- Increase in the production and sales of diversified crops.
- Adoption rate of precision agriculture technologies and practices.

Means of Verification:

- Surveys and assessments conducted before and after training programs.
- Monitoring and evaluation reports from extension services and implementing agencies.
- Infrastructure improvement reports from relevant government departments.
- Market data and sales records from agricultural produce markets.
- Field observations and feedback from farmers regarding the adoption of precision agriculture technologies.

Assumptions:

- Adequate funding and resources are available for implementing the plan.
- Political stability and consistent support for agricultural development.
- Farmers are willing to adopt new technologies and practices with proper training and support.
- Effective coordination and collaboration between government agencies, research institutions, and private-sector stakeholders.

By following this Log Frame matrix, the plan provides a structured approach to addressing the identified issues and challenges in this study. It emphasizes capacity building, infrastructure development, market linkages, and technological innovation to achieve sustainable improvements in agricultural productivity and livelihoods.

Conclusion

The Public Policy Simulation Exercise on "Minister of Agriculture's Task Force for Mechanizing the Agriculture Sector for Higher Yield, Crop Diversification, and Precision Agriculture in Pakistan" emphasizes the urgent need for a transformative approach to agriculture. The task force's comprehensive strategy addresses the pressing challenges facing Pakistan's agricultural sector, including low productivity, limited crop variety, and inefficient resource utilization. By integrating mechanization, crop diversification, and precision agriculture, the task force envisions a future where Pakistan's agricultural sector achieves sustainable growth and resilience (Social Policy and Development Centre [SPDC], n.d.). This holistic approach aims not only to enhance yields and diversify crops but also to ensure the efficient use of resources, ultimately contributing to the long-term sustainability and stability of Pakistan's agriculture.

Recommendations

Mechanizing the agriculture sector for higher yield, crop diversification, and precision agriculture in Pakistan requires a coordinated action plan at federal, provincial, and district levels. Below are practical recommendations for each level:

Federal Level Actions

1. **Policy Framework and Legislation:**

- **Develop a Comprehensive Agriculture Mechanization Policy:** Create policies to promote the adoption of modern agricultural machinery and practices.
- **Subsidies and Incentives:** Provide financial incentives, subsidies, and tax exemptions for purchasing and maintaining advanced agricultural machinery.
- **Research and Development (R&D):** Increase funding for R&D in agriculture technology, focusing on machinery suitable for local conditions.
- **Import Policies:** Simplify import regulations for advanced agricultural equipment and spare parts to ensure availability.

2. **Infrastructure Development:**

- **Establish Agricultural Machinery Manufacturing Hubs:** Promote the establishment of manufacturing units for agricultural machinery to reduce dependency on imports.
- **Enhance Rural Infrastructure:** Improve rural roads, electricity supply, and internet connectivity to facilitate the use of modern machinery and precision agriculture tools.

3. **Education and Training:**

- **National Training Programs:** Launch national-level training programs for farmers on the use and maintenance of agricultural machinery.
- **Collaboration with Universities:** Partner with agricultural universities to include mechanization and precision agriculture in their curricula.

Provincial Level Actions

1. **Implementation of Federal Policies:**

- **Adaptation of Federal Policies:** Tailor federal policies to provincial needs and ensure effective implementation.
- **Monitoring and Evaluation:** Establish mechanisms to monitor the implementation and impact of mechanization policies.

2. **Provincial Agricultural Research Institutions:**

- **Strengthen Research Institutions:** Enhance the capacity of provincial agricultural research institutions to develop and test machinery suited to local agricultural practices.
- **Collaborative Research:** Promote collaboration between provincial research institutions and international organizations. (*National Research Council, 2010*)

3. **Extension Services:**

- **Strengthen Extension Services:** Improve extension services to provide on-ground support and training to farmers in mechanization and precision agriculture.
- **Demonstration Farms:** Set up demonstration farms to showcase the benefits of modern machinery and precision agriculture techniques.

4. **Financial Support Programs:**

- **Credit Facilities:** Establish easy credit facilities for farmers to purchase machinery.
- **Insurance Schemes:** Develop insurance schemes for agricultural machinery to mitigate investment risks.

District Level Actions

1. **Local Implementation of Policies and Programs:**

- **Awareness Campaigns:** Conduct awareness campaigns about the benefits of mechanization and precision agriculture.
- **Local Partnerships:** Partner with local agricultural cooperatives, NGOs, and private sector players to promote mechanization.

2. **Support Services:**

- **Machinery Hiring Services:** Set up machinery hiring services to allow small-scale farmers to access advanced machinery on a rental basis.

- **Maintenance and Repair Centers:** Establish local centers for the maintenance and repair of agricultural machinery.
3. **Farmer Field Schools (FFS):**
 - **Practical Training:** Organize FFS to provide hands-on training to farmers on the use and benefits of agricultural machinery and precision agriculture.
 - **Community-Based Models:** Encourage community-based models where farmers can share resources and knowledge.
 4. **Local Data Collection and Analysis:**
 - **Precision Agriculture Tools:** Implement local data collection initiatives to support precision agriculture, such as soil health monitoring, weather stations, and yield mapping.
 - **Customized Solutions:** Use collected data to provide customized recommendations to farmers, improving efficiency and yield.

Cross-Level Coordination

1. **Integrated Information Systems:**
 - **Data Sharing Platforms:** Develop integrated information systems for data sharing between federal, provincial, and district levels to ensure coherent and coordinated efforts.
 - **Centralized Database:** Create a centralized database for tracking the adoption of mechanization and its impact on agricultural productivity.
2. **Regular Stakeholder Meetings:**
 - **Inter-Level Meetings:** Organize regular meetings between federal, provincial, and district stakeholders to review progress, address challenges, and adapt strategies as needed.
 - **Farmer Feedback Mechanism:** Establish mechanisms for farmers to provide feedback on policies and programs, ensuring they meet ground realities.
(Zain, Fatima, Naqvi, Farid, & Nasir, 2024)

By implementing these recommendations, Pakistan can effectively mechanize its agriculture sector, leading to higher yields, diversified crops, and the adoption of precision agriculture techniques.

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Enhancing FDI and Ease of Doing Business

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Abstract:

This study examines Pakistan's institutional framework for Foreign Direct Investment (FDI) and Ease of Doing Business (EODB) at federal and provincial levels. It evaluates the roles of key entities like the Board of Investment (BOI), Special Investment Facilitation Council (SIFC), and Ministry of Commerce, highlighting their strategies and challenges. While emphasizing Pakistan's advantages, such as its strategic location and investment incentives, the study identifies hurdles like bureaucratic inefficiencies and security risks. Opportunities from initiatives like the China-Pakistan Economic Corridor (CPEC) are explored alongside threats from economic instability and political uncertainty. Disparities between federal and provincial EODB policies underscore the need for alignment to attract investment. Drawing on global best practices, the study recommends measures such as infrastructure development, regulatory reforms, and anti-corruption strategies to create a conducive investment climate, driving sustainable economic growth.

Key words:

Foreign Direct Investment (FDI), Ease of Doing Business (EODB), Investment Climate, China-Pakistan Economic Corridor (CPEC), Regulatory Reforms

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Introduction

This paper evaluates the legal and institutional frameworks governing business operations and investments in Pakistan at both federal and provincial levels. It explores the roles and initiatives of various government bodies, such as the Board of Investment, Federal Board of Revenue, and provincial investment authorities, in fostering a conducive environment for business growth and attracting foreign investments. Additionally, it assesses the challenges and opportunities faced by Pakistan in enhancing its ease of doing business and promoting foreign direct investments.

Problem Statement

Pakistan's legal and institutional frameworks, despite the presence of agencies like the Board of Investment, face challenges in facilitating ease of doing business and attracting foreign direct investments due to bureaucratic hurdles, infrastructure deficiencies, security risks, and regulatory complexities. These challenges hinder business operations and investment inflows, impeding Pakistan's global competitiveness. Addressing these issues through simplified procedures, infrastructure development, improved security, and regulatory stability is crucial for enhancing economic prospects and attracting foreign investments.

Scope of the Study

This study aims to assess Pakistan's institutional framework and legal policies at both federal and provincial levels concerning Foreign Direct Investment (FDI) and Ease of Doing Business (EODB). It will analyze the strengths, weaknesses, opportunities, and threats (SWOT) of the current systems, identify gaps, and compare international best practices to provide recommendations for improvement. The study seeks to enhance understanding of the challenges and opportunities in improving Pakistan's investment climate and business environment.

Literature Review

Studies show that ease of doing business and institutional reforms positively influence foreign direct investment (FDI) inflows in developing countries. Xu, Hu, and Tahir (2023) highlight that resolving insolvency and paying taxes are crucial for FDI, particularly in developing regions. Jehangir, Lee, and Park (2020) find that FDI, capital formation, and labor force participation boost Pakistan's long-term economic growth, while military spending and inflation have adverse effects. Uddin et al. (2019) emphasize the role of government size, legal structure, and trade freedom in attracting FDI, noting that military regimes have historically had higher success compared to democratic ones.

Ahmad et al. (2022) discusses historical shifts toward trade liberalization to enhance investment. These insights can help the Finance Minister's Task Force devise strategies to attract more FDI and improve Pakistan's business environment.

To attract FDI and enhance the ease of doing business in Pakistan, this report examines the roles of various federal and provincial EODB institutions. By analyzing issues, challenges, and gaps, it explores the existing policy and institutional framework, the relationship between federal and provincial EODB institutions, and their functioning. Finally, the report suggests policy reforms on short-, medium-, and long-term bases, along with actionable plans necessary for escalating FDI and improving the ease of doing business.

The research is based on both qualitative and quantitative data. A mixed-methods approach is adopted, utilizing secondary sources such as research articles, newspapers, television talk shows, and websites. For primary data, semi-structured questionnaires were developed and shared with investment consultants (Annex-1). In addition, in-depth interviews were conducted with policymakers and officers of EODB institutions to gain a better understanding of the issues and challenges.

Analysis

Situational Analysis of Pakistan's Institutional Framework related to FDI and EODB at Federal & Provincial Level

Federal Level

Board of Investment:

Founded in 1992, this agency promotes local and foreign investment, providing support and assistance to investors.

SIFC:

Established under the Prime Minister's leadership to attract foreign investment and boost economic growth, it led to the Pakistan Investment Policy (PIP) 2023.

Ministry of Commerce & Trade:

Focuses on economic growth, trade facilitation, and export competitiveness, aiming to reduce the cost of doing business and increase global market access.

Federal Board of Revenue:

The main tax collection agency, established in 1924, responsible for administering and collecting federal taxes to promote fiscal self-reliance.

Special Economic Zone Authority:

Oversees the development and management of SEZs, areas with incentives to attract investment and promote exports.

Securities and Exchange Commission of Pakistan (SECP):

Regulates the corporate sector and capital markets, simplifies regulations, and enhances investor protection to promote ease of doing business.

Provincial Level

Punjab:

- Punjab Board of Investment and Trade (PBIT): Promotes investment and improves EODB.
- Punjab Revenue Authority (PRA): Collects sales tax on services.
- Punjab Small Industries Corporation (PSIC): Supports SMEs.

Sindh:

- Sindh Board of Investment (SBI): Promotes investment and facilitates investors.
- Sindh Revenue Board (SRB): Collects sales tax on services.

Khyber Pakhtunkhwa (KP):

- KP Board of Investment and Trade (KPBOIT): Promotes investment and facilitates investors.
- KP Revenue Authority (KPRA): Collects sales tax on services.

Baluchistan:

- Baluchistan Board of Investment and Trade (BBIT): Promotes investment and facilitates investors.
- Baluchistan Revenue Authority (BRA): Collects sales tax on services.

SWOT Analysis of EoDB Institutions (Federal and Provincial)

Strengths

1. Strategic Location: Pakistan's strategic location provides access to regional markets and trade routes, offering opportunities for investment and trade promotion.
2. Investment Incentives: Various institutions offer investment incentives, including tax exemptions, reduced tariffs, and streamlined approval processes to attract investors.
3. Sectoral Focus: Institutions focus on key sectors such as energy, infrastructure, manufacturing, and agriculture, aligning efforts with economic development priorities.
4. One-Window Facilities: Institutions provide one-window facilities to simplify the investment process, reducing bureaucratic hurdles and

- promoting ease of doing business.
5. **Infrastructure Development:** Institutions oversee infrastructure development, providing essential facilities and utilities to support industrial activities and attract investment.
 6. **Investment Promotion Activities:** Institutions conduct seminars, roadshows, and conferences to showcase investment opportunities and attract potential investors.
 7. **Trade Policy Formulation:** Institutions formulate trade policies to promote exports, enhance competitiveness, and facilitate trade by reducing trade barriers and improving customs procedures.

Weaknesses:

1. **Bureaucratic Procedures:** Bureaucratic red tape within government departments delays investment projects and hinders business operations.
2. **Infrastructure Challenges:** Inadequate infrastructure, including power shortages and transportation issues, poses challenges for investors and businesses.
3. **Security Concerns:** Security risks in certain regions undermine investor confidence and deter foreign investment.
4. **Regulatory Environment:** Complex and frequently changing regulatory requirements create uncertainty for investors, affecting business decisions and investment plans.
5. **Corruption:** Corruption within government institutions undermines trust in the investment environment and hampers transparency and accountability.
6. **Lack of Automation:** Government agencies are not fully automated, resulting in manual processes and delays.
7. **Lack of Coordination:** Poor coordination between different agencies leads to delays in project execution and decision-making.

Opportunities:

1. **China-Pakistan Economic Corridor (CPEC):** Institutions can leverage CPEC-related infrastructure projects to attract investment, promote industrialization, and enhance regional connectivity.
2. **Export Diversification:** Promoting investment in export-oriented industries can diversify Pakistan's export base and capitalize on international market opportunities.
3. **Renewable Energy:** Promoting investment in renewable energy projects can address energy shortages, reduce reliance on fossil fuels, and attract sustainable investments.
4. **Technology Transfer:** Encouraging technology transfer initiatives can enhance productivity, innovation, and competitiveness in key sectors.
5. **Regional Integration:** Strengthening regional trade agreements and partnerships can expand market access for Pakistani exporters and attract investment from neighboring countries.

Threats:

1. Economic Instability: Macroeconomic challenges such as inflation, currency devaluation, and fiscal deficits erode investor confidence and deter long-term investments.
2. Political Uncertainty: Political instability, governance issues, and policy unpredictability undermine investor confidence and deter foreign investment.
3. Global Economic Uncertainty: External factors such as global economic downturns, trade tensions, and geopolitical risks impact investment flows and economic growth prospects.
4. Security Risks: Security challenges, terrorism, and political unrest in certain regions deter foreign investors and pose risks to business operations.
5. Regulatory Risks: Changes in regulations, inconsistent enforcement, and policy reversals create uncertainty for investors, affecting business continuity and investment decisions.

Situational Analysis of Pakistan's Legal Policies & Initiatives Regarding FDI and EOBD at Federal & Provincial Level
Federal Level

Investment Policy 2023:

In Pakistan, the issuance and formulation of investment policies are primarily the responsibility of the federal government. The Board of Investment (BOI) has been entrusted with the task of promoting and facilitating investment in Pakistan. The BOI works under the Ministry of Industries and Production and serves as the central agency responsible for implementing the government's investment policies and strategies. Major initiatives under the policy include the liberalization of the investment regime, incentives and facilitation for investors, SEZs, streamlined approval processes for registration and licensing, investor protection schemes, and sector-specific policies.

Tax Laws:

The Federal Board of Revenue (FBR) is responsible for tax collection and policy in Pakistan. It provides guidelines for taxation, including corporate tax, income tax, and sales tax. Major initiatives include the Pakistan Single Window, export facilitation schemes, amendments to Sections 71, 212, and 255 in the Companies Act, 2017, intellectual property rights, automation of income tax business processes, and tax exemptions for SEZs.

Trade Laws:

Trade laws aim to promote exports, reduce trade barriers, and improve the competitiveness of Pakistani businesses in international markets. Initiatives include the Trade-Related Investment Framework (TRIPF) 2015–2023, the Foreign Private Investment (Promotion and Protection) Act, 1976, and the

Export Facilitation Schemes, 2021. Other efforts, such as "Vision Pakistan: Road to \$100 Billion Exports," the E-Commerce Business Facilitation Hub, trade exhibitions at expo centers, and policy formulation by Pakistan Customs, the Ministry of Commerce & Trade, and the Inland Revenue Service, support these goals.

Investment Laws:

Pakistan has laws governing foreign investment, such as the Foreign Private Investment (Promotion and Protection) Act, 1976, and the Investment Policy, which outlines incentives, protections, and procedures for foreign investors. These initiatives, including customized incentive packages, infrastructure development funds, and investor outreach programs, aim to create a conducive investment environment by providing incentives, ensuring investor protection, and facilitating dispute resolution.

Initiatives by SIFC & BOI:

1. Sector-Specific Policies: Investment Promotion Scheme 2020–2023, Electric Vehicle Policy 2020–2025, Mobile Development Policy, and Automotive Development Policy.
2. Attractive Investment Packages:
 - i. No government permission required for investments in agriculture, social, infrastructure, services, and manufacturing sectors (except for four specific manufacturing areas: arms & ammunition, high explosives, radioactive substances, and security printing).
 - ii. 100% foreign equity allowed.
 - iii. Remittance of capital, profits, and dividends permitted.
 - iv. Tax exemptions and reduced import tariffs.
 - v. Liberalized policies on royalties, technical fees, and foreign investment in most sectors.
 - vi. Simplified equity requirements and rights for foreign investors to repatriate profits and access land for projects.

Provincial Level

Pakistan's four provinces—Punjab, Sindh, Khyber Pakhtunkhwa (KP), and Baluchistan—each have legislative frameworks governing Ease of Doing Business (EODB) and Foreign Direct Investments (FDIs).

Punjab:

The Punjab Industrial Estates Development and Management Company Act, 2010, facilitates industrial estate development, while the Punjab Investment Policy, 2019, outlines investor incentives. The Punjab Local Government Act, 2019, streamlines local governance, affecting business operations.

Sindh:

The Sindh Industrial Trading Estate (SITE) Act, 1961, governs industrial areas, while the Sindh Special Economic Zones Act, 2016, provides a framework for SEZs. The Sindh Environmental Protection Act, 2014, ensures environmental compliance.

Khyber Pakhtunkhwa:

The Khyber Pakhtunkhwa Industries Act, 2019, promotes industrial development. The KP SEZ Development and Management Company Act, 2012, and the KP Environmental Protection Act, 2014, govern SEZs and environmental compliance.

Baluchistan:

The Baluchistan Development Authority Act, 1972, supports economic growth, while the Baluchistan Industrial Policy, 2016, encourages industrialization. The Baluchistan Environmental Protection Act, 2012, mandates environmental protection measures.

5.3 Initiatives Taken by Provinces

- The government of Sindh has completed 140 Registrations, Licenses, Certificates, and Other Permits (RLCOs) and has earmarked 100 RLCOs for the second phase.
- In Punjab, the assessment of business regulations exercise was initiated in February 2021 with the support of all provincial departments and completed in December 2022.
- More than 60 provincial regulators/issuing authorities were covered under this extensive exercise.
- As a result, around 176 unique Registrations, Licenses, Certificates, Permits, NOCs, etc., issued by different regulators were identified.
- In the first phase, six (6) departments, including Industries, Agriculture, Livestock, Housing, Environment, and Local Government, were selected for implementation.
- Six facilitation centers have been established in six districts of Punjab for EODB.
- The EODB cell was inaugurated on March 31, 2021, in KPBOIT.
- Development of one-window services for the business community has been undertaken by the KP Board of Investment and Trade and the KP Information Technology Board.
- An EODB committee was established in March 2019, headed by the Minister for Finance KP and the Special Assistant to the CM KP on Industries and Commerce.
- The One Window Business Portal (Asaan Karobar) was established, integrating 13 provincial and 5 federal regulators into the portal.
- The Halal Food Authority was successfully integrated into the Asaan Karobar Portal.

- An Investment Promotion Guide for business community guidance was developed.
- A total of 17,768 applications were approved out of 20,160 via the Asaan Karobaar Business Facilitation Portals (Sarwar, 2024).

Gap Analysis: Pakistan's EODB and FDI Policies ***Foreign Direct Investment (FDI) Attractiveness***

Current State (As-Is):

Pakistan's FDI inflows have been below target in recent years, with only a few sectors and industries attracting significant foreign investment. This limited FDI presence restricts economic growth and diversification.

Desired Future State (To-Be):

The goal is to achieve a diversified FDI portfolio across various high-growth sectors, significantly increasing FDI inflows to meet national development goals.

Gap:

To bridge this gap, it is crucial to identify and address barriers hindering FDI in key sectors. This involves understanding investor concerns, improving sector-specific policies, and creating a more conducive investment climate.

Ease of Doing Business

Current State (As-Is):

Pakistan currently ranks low in global ease of doing business indices, reflecting cumbersome regulations and bureaucratic hurdles that deter business operations and growth.

Desired Future State (To-Be):

A streamlined regulatory environment where business-related processes are simplified and digitized, enhancing efficiency and reducing red tape.

Gap:

To achieve this, Pakistan needs to undertake comprehensive reforms to simplify business procedures, eliminate unnecessary regulations, and leverage digital technologies to facilitate easier business transactions and operations.

Regulatory Environment

Current State (As-Is):

The application of laws and regulations in Pakistan is often inconsistent, creating uncertainty and discouraging investment and business activities.

Desired Future State (To-Be):

A robust and transparent regulatory framework that ensures consistent application of laws and builds investor confidence.

Gap:

Closing this gap requires a thorough review and reform of existing laws and regulations to ensure they are clear, fair, and consistently applied.

Establishing transparent regulatory practices will be key to building a stable business environment.

Infrastructure and Support

Current State (As-Is):

Pakistan's physical infrastructure, including power, transportation, and logistics, is inadequate and outdated, hampering economic activities and growth.

Desired Future State (To-Be):

Modernized and well-developed infrastructure that supports efficient business operations and attracts investment.

Gap:

Addressing this gap involves prioritizing infrastructure development projects, securing funding, and ensuring timely and quality execution of these projects to build a strong foundational support system for the economy.

Talent and Workforce

Current State (As-Is):

There are significant skills gaps in certain industries and technical fields, limiting the country's ability to support and sustain industrial growth and innovation.

Desired Future State (To-Be):

A highly skilled and adaptable workforce equipped to meet the demands of various industries.

Gap:

Bridging this gap requires substantial investment in education and vocational training programs, focusing on aligning curricula with industry needs and fostering continuous skill development to create a competitive workforce.

Incentives and Policies

Current State (As-Is):

Existing incentive schemes in Pakistan are limited in scope and impact, failing to attract substantial investment or drive desired economic outcomes.

Desired Future State (To-Be):

Attractive, comprehensive, and well-structured incentive programs that effectively draw investments and stimulate economic growth.

Gap:

To enhance the effectiveness of investment incentives, there needs to be a comprehensive review and enhancement of current schemes. This involves designing incentives that are more appealing to investors, addressing their needs and concerns, and ensuring these programs are well-promoted and accessible.

Analysis of Issues & Challenges

In Pakistan, investment has favored the trading sector over manufacturing, leading to fewer jobs and less value addition. Manufacturing drives employment and establishes linkages with other sectors. Economic Zones are scattered, complicating government support. Middlemen inflate land prices and commissions. Additionally, KPIs for manufactured products are either absent or poorly enforced.

Security Concerns:

- Pakistan has faced persistent security challenges, including terrorism, insurgency, and political unrest, particularly in regions like Baluchistan and the tribal areas along the Afghan border.
- The Global Terrorism Index consistently ranks Pakistan among the countries most affected by terrorism.
- Security concerns not only deter foreign investors but also increase the cost of doing business due to the need for security measures and higher insurance premiums.

Political Instability:

- Pakistan has experienced frequent changes in government due to political instability, with military coups and civilian governments being overthrown.
- According to the World Bank's Worldwide Governance Indicators, Pakistan's political stability and absence of violence/terrorism scores have been relatively low compared to other countries in the region.
- The uncertainty arising from political instability can lead to inconsistent policies and regulations, which are detrimental to attracting FDI.
- Reference: World Bank, Worldwide Governance Indicators

Registering Property:

- The procedures and duration for registering property are lengthy. It involves 8 procedures in Karachi and 6 in Lahore, with a particularly long duration of 208 days in Karachi.
- The cost of property registration is 4.2% of the property value, which is significantly expensive for businesses.
- The quality of the land administration index is low (7/30 in Karachi), indicating inefficiencies and potential inaccuracies in the land registration process.
- The system is not fully automated, and there is a lack of transparency in procedures.
- There is an absence of efficient mechanisms to handle land disputes, leading to delays and uncertainties.

Starting a Business:

- Entrepreneurs face a cumbersome process involving 10 different procedures and a lengthy duration of approximately 16.5 days to officially start a business.
- The cost of starting a business is relatively high at 6.8% of the income per capita, making it financially burdensome for many entrepreneurs.
- The registration processes for various institutions like the Employees' Old-Age Benefits Institution (EOBI), Social Security Institutes (PESSI/SESSI), and Provincial Labor Departments in Punjab and Sindh are not fully integrated, causing inefficiencies and delays.

Dealing with Construction Permits:

- The procedures and processing times for obtaining construction permits are lengthy. It takes 18 procedures in Karachi and 20 in Lahore, with processing times of 261 days and 266 days, respectively, ultimately delaying construction projects.
- In Karachi, the cost of obtaining construction permits is 11.8% of the warehouse value, which is prohibitively expensive for many businesses.
- The approval process for construction permits lacks transparency, with no centralized system to streamline the obtaining of necessary No Objection Certificates (NOCs) from various agencies.
- Requirements such as the property valuation form (PT-1) from WASA in Lahore add unnecessary complexity and delays.

Getting Electricity:

- The process to obtain an electricity connection takes 185 days in Karachi and 117 days in Lahore, which is excessively long compared to global standards.
- The cost of getting electricity is extremely high, amounting to over 1580% of the property value.
- The procedures, guidelines, and fees are not transparent, making it

difficult for businesses to navigate the application process.

- There is no reliability in the supply of electricity, and tariffs are not transparent, contributing to uncertainty and operational challenges for businesses.

Getting Credit:

- The strength of the legal rights index is low (2/12), indicating inadequate protection for creditors and borrowers.
- The credit registry and credit bureau coverage are limited, restricting access to comprehensive credit information.
- The secured transactions framework is not fully operational, and there is no unified geographically notice-based, searchable electronic registry.
- Credit reporting service providers do not cover data from various sources such as retailers and utilities, limiting the depth of credit information available.

International Best Practices for Attracting FDI & Ease of Doing Business

Bangladesh

- Padma Bridge, Dhaka Elevated Expressway.
- One-Stop Service Act (2018), Startup Bangladesh (2021).
- TVET institutions increased from 5,800 (2017) to 9,000 (2023).
- Bangladesh-Germany Institute of Technology (2020).
- Reduction of corporate tax from 30% to 22%.
- Multilateral Investment Guarantee Agency (MIGA) insurance for investors against non-commercial risks and political unrest.

(Source: lloydsbanktrade.com, April 2024)

India

- 8.2.1 National Infrastructure Pipeline (NIP), which forecasts investment in 7,000 projects.
- 8.2.2 "Make in India" and "Digital India" initiatives.
- 8.2.3 Atmanirbhar Bharat Abhiyan (Self-Reliant India Mission).
- 8.2.4 Focus on economy, infrastructure, technology-driven systems, vibrant demography, and demand.
- 8.2.5 Empowered group of secretaries providing support and facilitation to investors.
- 8.2.6 National Single Window System introduced.
- 8.2.7 Project development cells established in 29 departments.

(Source: Financial Express, April 18, 2024)

China

- 8.3.1 25% tax exemption for income-generating establishments in China.
- 8.3.2 15% tax exemption for industries situated in the western regions.
- 8.3.3 Start-up subsidy of RMB 5 million.
- 8.3.4 Rental subsidy equal to 30% of the total rent.
- 8.3.5 Performance rewards ranging from RMB 2 million to RMB 5 million.
- 8.3.6 10% tax credit for industries utilizing domestic raw materials.

(Source: taxsummaries.pwc.com)

USA

- 8.4.1 Infrastructure Investment: Initiatives like the Build Back Better plan and the Bipartisan Infrastructure Investment and Jobs Act.
- 8.4.2 Taxation: Tax Cuts and Jobs Act (2017) lowered the corporate tax rate from 35% to 21%.
- 8.4.3 Workforce Development: Investment in apprenticeship programs, vocational training, and STEM education.
- 8.4.4 Immigration Policies: Reviewing programs like the EB-5 Immigrant Investor Program for better alignment with economic priorities.
- 8.4.5 Trade and Investment Agreements: Negotiating BITs, FTAs, and regional trade pacts to facilitate cross-border investment.
- 8.4.6 Technology and Innovation: Investing in AI, biotechnology, advanced manufacturing, and R&D funding.

Conclusion

Pakistan's legal and institutional frameworks at both federal and provincial levels play a crucial role in shaping the business environment and attracting investments. While initiatives such as investment policies, tax reforms, and infrastructure projects have been introduced, challenges such as bureaucratic red tape, infrastructure deficiencies, security risks, and regulatory complexities persist. By learning from international best practices and addressing these challenges through targeted reforms, Pakistan can enhance its ease of doing business, stimulate economic growth, and attract foreign investments for sustainable development.

Recommendations

Starting a Business

Short-term:

1. Integrate EOBI registration with SECP e-services.
2. Merge PESSI/SESSI with Provincial Labor Departments in Punjab and Sindh.
3. Clarify and promote online business registration.

Medium to Long-term:

4. Eliminate physical inspections and biometric appointments for sales tax registration.
5. Merge STRN and NTN for a unique business ID.
6. Create a single online portal for all registrations.
7. Remove the company seal requirement and promote awareness.

Dealing with Construction Permits

Short-term:

1. Improve pre-screening and adhere to timelines.
2. Increase transparency in permit approvals.
3. Centralize NOCs for all construction types.
4. Remove the PT-1 requirement from WASA in Lahore.
5. Expand the e-permit system and e-payments in Lahore.

Medium to Long-term:

6. Link LDA and SBCA with land management systems.
7. Implement a risk-based approval system.
8. Set up a single window for construction permits.
9. Allow private firms to sign off on completion certificates.
10. Introduce defect liability legislation and insurance in Lahore.

Getting Electricity

Short-term:

1. Study the application process for bottlenecks.
2. Provide cost calculators and transparency.
3. Allow installment payments for fees and deposits.
4. Include load shedding in SAIDI and SAIFI calculations.
5. Set binding time limits for grid connections.

Medium to Long-term:

6. Increase material availability at utilities.
7. Streamline internal wiring inspections.
8. Implement a full online application system with e-payments.
9. Introduce GIS for the electricity network.
10. Obtain excavation permits for clients in Karachi.
11. Invest in smart meters.

Registering Property

Short-term:

1. Publicize service standards and time limits in Karachi.
2. Increase transparency by publishing land dispute stats.
3. Raise awareness about reforms and legal requirements.
4. Track and address property registration complaints.
5. Automate stamp duty payments in Karachi and Lahore.

6. Link PLRA and Excise and Taxation Department systems in Lahore.
7. Fully automate NOC procedures in Karachi.
8. Review land procedures at the Board of Revenue in Karachi.

Medium to Long-term:

9. Fully digitize ownership records and cadastral plans.
10. Establish a single land administration agency in Karachi.
11. Train staff for new land systems.
12. Reduce time for land dispute decisions and streamline processes.

Getting Credit

Short-term:

1. Adopt regulations for the ST Act.
2. Include retailer and utility data in credit reports.
3. Implement a unified electronic secured transactions registry.

Medium to Long-term:

4. Amend the legal framework for a unified system.
5. Amend the Corporate Rehabilitation Act for automatic stay limits.
6. Amend the Companies Act for priority payment to secured creditors.
7. Promote awareness and capacity-building for the ST Act.

Protecting Minority Investors

Short-term:

1. Require independent review and public disclosure of related-party transactions.
2. Allow shareholders to hold directors liable for unfair transactions.
3. Give courts authority to cancel unfair transactions.
4. Allow plaintiffs to question defendants and recover legal expenses.

Medium to Long-term:

5. Require shareholder approval for new shares or members.
6. Require tender offers for 50% acquisitions in limited liability companies.
7. Increase investor protection with management compensation disclosure.
8. Allow shareholders with 5% ownership to add meeting agenda items.

Paying Taxes

Short-term:

1. Enable e-payment for Corporate Income Tax and GST.
2. Streamline GST filing and payment processes.
3. Conduct outreach on new tax systems and reforms.

Medium to Long-term:

4. Extend e-filing and e-payment to all taxes and contributions.
5. Study the feasibility of merging tax filings and payments.

6. Improve GST refund processing times.
7. Enhance risk-based audits for GST and CIT.

Trading Across Borders

Short-term:

1. Streamline port processes to eliminate duplicate activities.
2. Improve the Customs risk management system.
3. Automate price certificates for exports.
4. Reduce bill of lading processing time.
5. Expedite electronic Certificate of Origin issuance.

Medium to Long-term:

6. Improve electronic I-Form and Form-E systems.
7. Implement a smart examination system for red channel consignments.
8. Discourage ports as free storage areas.
9. Deploy business intelligence and data analytics tools.
10. Implement the Port Community System and Pakistan National Single Window System.

Enforcing Contracts

Short-term:

1. Assess court processes and legal frameworks to reduce delays.
2. Create specialized commercial courts.
3. Introduce case management practices and pretrial conferences.
4. Support electronic filing and court automation.

Medium to Long-term:

5. Provide continuous training for judges.
6. Promote mediation and conciliation.
7. Evaluate increasing the jurisdictional threshold of the Sindh High Court.

Resolving Insolvency

Short-term:

1. Enact secondary legislation for the Corporate Rehabilitation Act.
2. Create an accessible insolvency registry.

Medium to Long-term:

3. Introduce simplified procedures for SME insolvency.
4. Allow post-commencement financing in non-administration proceedings.
5. Revise the Corporate Rehabilitation Act to enhance creditors' rights.
6. Extend powers for debtor-in-possession procedures.
7. Add a pre-packaged restructuring option for swift processing.
8. Improve judicial capacity for insolvency cases.

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Reforming Technical Education and STEM for Technological Advancement and Innovation

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Abstract:

This study examines the state of technical and STEM education in Pakistan, emphasizing its role in industrial growth and economic development. Using a combination of qualitative and quantitative methods, including SWOT and PESTLE analyses, the research evaluates policies, practices, and global comparisons. Key findings reveal gaps in policy frameworks, weak institutional coordination, and underutilized resources. Challenges include inadequate infrastructure, outdated curricula, and insufficient industry-academia collaboration, limiting STEM education's effectiveness. However, Pakistan's youthful population, technological advancements, and potential international partnerships offer significant opportunities to address these issues. The paper proposes actionable recommendations, including policy reforms, increased funding, and improved stakeholder collaboration, tailored to Pakistan's socio-economic context. A log frame matrix outlines short- and long-term strategies to enhance STEM education's contribution to industrial and economic development. The study underscores the need for sustainable reforms to create a more impactful and efficient education system, fostering long-term national prosperity.

Key words:

STEM Education, Technical Education, Policy Reforms, Industrial Development, Pakistan

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Problem Statement

Pakistan's economic growth depends on industrial development, which is inherently tied to technological advancement and innovation fostered through technical education and STEM. This research investigates the current ecosystem of technical and vocational education and STEM in Pakistan, focusing on the federal level and Khyber Pakhtunkhwa. The study identifies key shortcomings and proposes a practical roadmap for improvement.

Background

Technical education involves acquiring practical skills, knowledge, and competencies related to specific trades or professions (Sather et al., 2016). It typically includes hands-on training in fields like engineering, manufacturing, and IT. STEM (Science, Technology, Engineering, and Mathematics) integrates these disciplines to solve complex problems, drive innovation, and support technological development (GOI, 2021). Together, technical education and STEM are critical for workforce preparation and enhancing economic productivity, competitiveness, and prosperity (Sather et al., 2016).

Innovation, defined as the creation and implementation of transformative ideas or products (Schilling, 2020), is central to economic growth. The Global Innovation Index (GII) ranks Pakistan 88th out of 132 economies in 2023, highlighting strong innovation outputs (68th) but weak inputs (113th) (Dawn, 2023). While Pakistan outperforms many lower-middle-income economies, it significantly lags behind regional peers like India (40th) (WIPO, 2023).

Challenges in Pakistan's technical education and STEM sectors include inadequate infrastructure, outdated curricula, insufficient resources, and limited practical learning opportunities (Sather, Singh, & Thurman, 2016). Chronic underfunding further hinders teacher training, infrastructure, and curriculum reforms (Zeb, Khan, & Ahmad, 2021). These barriers limit Pakistan's capacity to develop a skilled workforce capable of meeting global economic demands (Government of Pakistan, 2021).

Recognizing these issues, Pakistan has initiated reforms to align technical education and STEM with global standards. Key initiatives include curriculum enhancements, project-based assessments, industry internships, and professional development for educators. Collaboration among academia, industry, and international stakeholders is emphasized to foster innovation-driven growth.

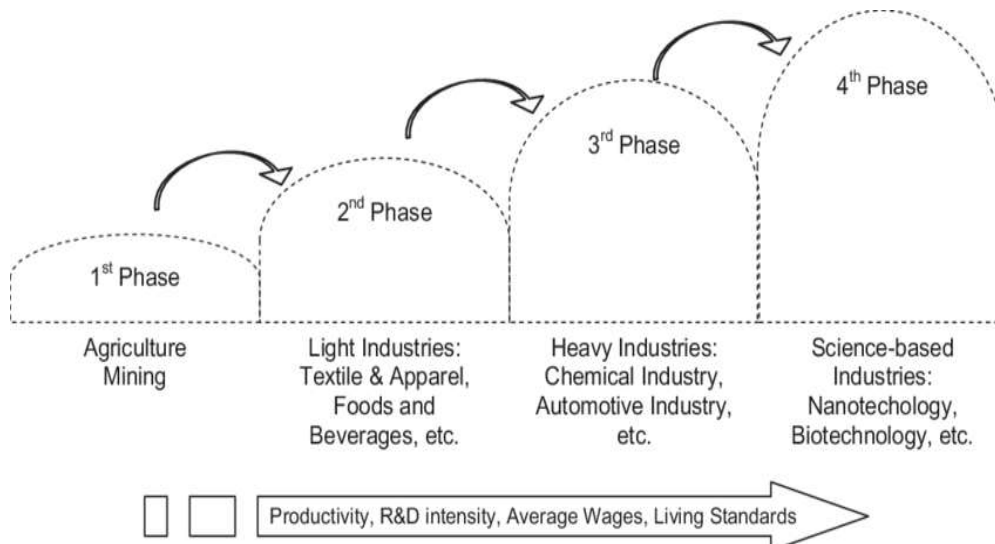
Research methodology

A mixed-method approach combining qualitative and quantitative methods employed. The methodology designed to comprehensively explore the current state of technical education and STEM fields in Pakistan, identify challenges and opportunities, and develop evidence-based policy recommendations. The study carried out situational analysis of current policies, initiatives, practices, and contributions, literature review, analysis of the existing legal and institutional framework, comparative analysis with global best practices, examining successful models from other countries will allow for a comparative analysis, highlighting best practices that can be adapted to Pakistan's context. Additionally, SWOT Analysis of Technical Education and STEM Institutions and stakeholders' interviews. PESTLE/GAP Analysis, practical plan using Log Framework Matrix to organize and present the recommended actionable plan.

Theoretical Underpinnings

Endogenous Growth Theory

In the context of Pakistan's industrial development, the ****Endogenous Growth Theory****, proposed by Romer (1986), emphasizes the pivotal role of technological innovation, human capital, and knowledge spillovers in achieving sustained economic growth. For Pakistan to advance its industrial sector, substantial investments in education, technology, and research and development (R&D) are imperative. By cultivating a skilled workforce equipped with modern technological expertise and fostering innovative practices, Pakistan can enhance productivity and drive industrial progress. Furthermore, promoting knowledge spillovers through robust industry-academia partnerships and international collaborations can accelerate technological advancements and economic growth. Prioritizing these areas will enable Pakistan to establish a resilient and competitive industrial



foundation, consistent with the principles of Endogenous Growth Theory.

Analysis of Issues and Challenges

Situational Analysis of current Policies and Practices

Federal Government has introduced a number of policies, initiatives and practices for technological advancement, innovation and STEM in the country. A brief situational analysis is as under:

1. National Education Policy Framework 2018

The framework emphasizes improving education quality at all levels, with a strong focus on STEM education. It aims to enhance students' critical thinking and problem-solving skills.

2. Technical and Vocational Education and Training (TVET) Policy 2018

This policy focuses on developing a skilled workforce through vocational and technical education. It addresses skills gaps by introducing competency-based training programs, enhancing industry-academia linkages, and promoting public-private partnerships.

3. National Skills for All Strategy 2021

This strategy ensures accessible, high-quality technical and vocational training for all. It involves expanding vocational training centers, integrating technology into training programs, and providing financial support to students.

4. National Science, Technology, and Innovation Policy 2022

This policy provides a comprehensive plan to foster innovation and technological development. It includes increased funding for R&D, the establishment of innovation hubs, and the promotion of STEM education.

5. STEAM Pakistan Initiative

Led by the Ministry of Federal Education and Professional Training, this initiative promotes holistic education to develop critical thinking, problem-solving, and collaboration skills.

6. TVET Reform Initiative

Supported by international partners, this initiative enhances equitable access to quality training and boosts employability.

7. Prime Minister's Youth Skill Development Program (PMYSDP)

This program empowers youth with skills, including high-tech training, conventional skill development for underprivileged areas, and apprenticeships.

8. Partnerships with International Organizations

Collaborations with entities such as the European Union, German Cooperation, and the Norwegian Embassy have improved vocational training through resource sharing, curriculum development, and best practices.

9. Hands-On Practical Learning

Vocational schools emphasize practical learning in fields like dental assistance, hardware repair, agriculture, and IT. Short-duration programs equip students with job-ready skills.

10. Accessible and Inclusive Training

Many government-funded and non-profit-led vocational programs are accessible to economically disadvantaged groups and include training for disabled individuals.

11. Demand-Driven Skills

Vocational training aligns with market demands, equipping students with high-demand skills, reducing the skills gap, and enhancing employability.

Critical Review

Vocational Training: Significant in industrial development through workforce skill enhancement, youth employment, and entrepreneurship (NAVTTTC, 2023; TEVTA, 2023).

National Education Policy Framework 2018: Lacks practical application and industry integration (Government of Pakistan, 2018).

TVET Policy 2018: Identifies skills gaps and promotes linkages but has limited reach (Government of Pakistan, 2018).

National Skills for All Strategy 2021: Broadens vocational training access but faces quality assurance challenges (Government of Pakistan, 2021).

National Science, Technology, and Innovation Policy 2022: Provides a solid foundation for innovation but requires increased funding and robust implementation (Government of Pakistan, 2022).

Analysis of the Existing Legal and Institutional Framework

Technical Education and Vocational Training Authority (TEVTA)

TEVTA operates in the provinces, focusing on curriculum development, teacher training, and industry linkage programs.

National Vocational and Technical Training Commission (NAVTTTC)

NAVTTTC plays a pivotal role in overseeing and coordinating the TVET sector

in Pakistan. It develops national policies, standards, and frameworks to ensure alignment of technical education with industry requirements.

Higher Education Commission (HEC)

The Higher Education Commission (HEC) of Pakistan regulates and accredits higher education institutions offering STEM programs. It provides essential funding for research and development, promotes quality assurance through accreditation and ranking systems, and encourages international collaborations to enhance STEM education.

HEC's initiatives include establishing research centers and technology parks within universities, promoting startup incubation, and funding technological research projects, which significantly contribute to technological advancement and innovation. Additionally, HEC supports digital learning through the Pakistan Education and Research Network (PERN), connecting academic institutions to digital libraries and high-speed internet (Tribune, 2022).

Despite these efforts, HEC's impact is constrained by bureaucratic challenges and inconsistent funding, hindering seamless implementation and program sustainability. Faculty development initiatives are beneficial, but retaining trained educators is challenging due to better opportunities abroad. There is limited funding for establishing reverse engineering programs, and the integration of reverse engineering concepts into engineering curricula is unclear. Faculty training workshops may lack standardization, leading to inconsistency. Furthermore, financial support for university-industry projects focused on reverse engineering is lacking, highlighting the need for targeted and sustained funding and support (HEC, 2023; Dawn, 2021; Tribune, 2022).

Pakistan Science Foundation (PSF)

PSF supports scientific research and innovation in Pakistan by providing grants for research projects, organizing science competitions, and promoting STEM education through outreach programs. It aims to create a scientific culture and encourage young people to pursue STEM careers.

Provincial Education Departments

Provincial education departments implement national education policies at the local level and oversee technical and vocational training institutions.

Comparative Analysis

United States and South Korea

These countries excel through substantial funding, strong industry-academia partnerships, and curricula emphasizing critical thinking. Institutions like the National Science Foundation (NSF) and robust government policies bolster advancements (NSF, 2023; Ministry of Education, South Korea, 2023).

Germany and Finland

Germany’s dual education system integrates vocational training with classroom instruction, producing a highly skilled workforce. Finland emphasizes creativity, collaboration, and technology integration, preparing students for the modern workforce (Federal Ministry of Education and Research, Germany, 2023; Ministry of Education and Culture, Finland, 2023).

United States, Finland, and South Korea

The U.S. STEM Education Coalition advocates for policy changes and increased investment in STEM education. Finland integrates technology across curricula to foster creativity and critical thinking. South Korea promotes collaboration between educational institutions and industries, resulting in rapid technological advancements and a high number of STEM graduates (Ministry of Education and Culture, Finland, 2023; Ministry of Education, South Korea, 2023).

SWOT Analysis of Education and STEM Related Institutions

SWOT for Federal Government

Category	Strengths	Weaknesses
Internal Factors	1. Establishment of bodies like TEVTA and NAVTTC to regulate and promote technical education.	1. Many institutions lack modern laboratories and equipment necessary for hands-on learning.
	2. Partnerships with international organizations like the EU enhance resources and training quality.	2. Insufficient programs for continuous professional development of educators.
	3. A large, young population provides a significant pool of potential students for STEM fields.	3. Limited financial resources hamper the development and implementation of advanced educational programs.
	4. Ongoing efforts to update and align curricula with global standards and industry needs.	4. Persistent mismatch between industry requirements and the skills of graduates.
Category	Opportunities	Threats
External Factors	1. Potential for more collaborations with international educational and industry partners to enhance curriculum and training.	1. High inflation and economic challenges can limit funding and investment in education.
	2. Adoption of emerging technologies can modernize educational practices and improve learning outcomes.	2. Frequent changes in government and policies can disrupt long-term educational planning and initiatives.

	3. Increasing focus on promoting entrepreneurship amongst STEM students can drive innovation.	3. Societal norms may hinder the participation of women and underrepresented groups in STEM fields.
	4. New policies aimed at boosting vocational and technical education can improve the overall education landscape.	4. Rapid advancements in STEM education in other countries can leave Pakistan lagging behind if it does.

SWOT for Higher Education Commission (HEC) of Pakistan

Strengths	Weaknesses	Opportunities	Threats
Established authority for higher education. Supports research and innovation through funding and policies. Facilitates international collaborations.	Limited funding compared to global standards. Bureaucratic delays can hinder initiatives. Inconsistent education quality across institutions.	Attract international funding and partnerships. Leverage global focus on STEM education for development. Integrate advanced technologies in curricula.	Economic instability affecting funding and policy implementation. Political changes leading to policy discontinuity. Competition from private institutions with better resources.

Pakistan Science Foundation (PSF)

Strengths	Weaknesses	Opportunities	Threats
Promotes scientific research and STEM education.	Limited funding and resources compared to global standards.	Potential for international collaborations and funding.	Economic constraints limiting funding and resources.
Provides grants and funding for research projects.	Inadequate infrastructure for advanced scientific research.	Growing interest in STEM fields can drive program expansion.	Political instability affecting policy continuity.
Organizes science competitions and outreach programs.	Lack of coordination with other educational institutions.	Opportunities to integrate new technologies and methodologies in science education.	Brain drain with talented researchers and students moving abroad.

National Vocational & Technical Training Commission (NAVTTTC)

Strengths	Weaknesses	Opportunities	Threats
Central authority for vocational and technical training. Develops national standards and policies.	Limited reach and accessibility, especially in rural areas. Insufficient practical training infrastructure.	Potential for public private partnerships to enhance programs. Growing demand for skilled labor can drive program expansion.	Rapid technological changes requiring constant updates to programs. Economic challenges reducing funding and support.
Focuses on aligning training programs with industry needs.	Dependence on limited government funding.	Increasing global emphasis on technical skills attracting international support.	Competition from advanced international vocational training programs.

Technical Education and Vocational Training Authority (TEVTA)

Strengths	Weaknesses	Opportunities	Threats
Focuses on practical skills and competency-based training. Offers a variety of diploma and certification courses. Aims to develop a globally competitive workforce.	Limited infrastructure and resources for advanced training. Inconsistent quality of training across different regions. Challenges in keeping curricula up to date with industry needs.	Potential for increased collaboration with industry partners. Growing demand for skilled labor in various sectors. International partnerships and funding opportunities.	Economic instability affecting funding and resource allocation. Rapid technological advancements requiring continuous updates to training programs. Competition from private vocational training institutes with better facilities.

Provincial Education Departments

Strengths	Weaknesses	Opportunities	Threats
Implement national education policies at the local level.	Variability in policy implementation and educational quality across provinces.	Leverage local industry partnerships for vocational training.	Regional disparities in funding and resource allocation.
Manage funding and oversee the operation of training institutions.	Limited resources and infrastructure, especially in rural areas.	Address regional educational needs with tailored programs.	Political and administrative changes affecting policy continuity.
Play a crucial role in regional education development.	Bureaucratic challenges and inefficiencies.	Potential for increased funding and support from federal initiatives.	Economic challenges impacting the implementation of educational programs.

Industry

Strengths	Weaknesses	Opportunities	Threats
Provide UpToDate industry relevant training. Flexibility to adapt quickly to changing industry needs.	May prioritize profit over educational quality. Limited focus on broader educational outcomes beyond immediate industry needs.	Growing demand for skilled labor can drive private sector investment in education. Opportunities for public private partnerships to enhance vocational training.	Economic downturns affecting private sector investment in education. Competition from public institutions and international vocational training programs.
Resources to invest in advanced training infrastructure.	Potential disconnects with national education policies.	Potential to set industry standards for technical education.	Regulatory challenges and changes in education policy.

Nongovernmental Organizations (NGOs)

Strengths	Weaknesses	Opportunities	Threats
Focus on improving access to quality education and vocational training. Ability to reach underserved and marginalized communities.	Dependence on donor funding, which can be unstable. Limited scale and reach compared to government programs.	Potential to form partnerships with government and private sector. Growing recognition of the importance of vocational training and STEM education.	Economic instability affecting donor funding. Political changes impacting NGO operations and support.
Flexibility to innovate and adapt to local needs.	Challenges in sustaining longterm projects without consistent funding.	Opportunities to pilot innovative educational approaches.	Competition for limited funding resources from other NGOs.

GAP Analysis for Technical and STEM Education in Pakistan

Aspect	Current State	Gap	Desired State
Curriculum and Training	Outdated curricula not aligned with industry needs	Modernized curriculum incorporating emerging technologies and global standards	Updated curricula aligned with industry and global standards, including practical learning experiences
Infrastructure	Educational institutions lack modern laboratories and equipment	Significant investment needed in infrastructure	Well-equipped laboratories and research facilities with modern teaching tools
Teacher Training	Insufficient training programs for educators	Comprehensive training programs for continuous professional development	Skilled educators with UpToDate pedagogical skills and subject knowledge
Research and Development (R&D)	Limited funding and resources for R&D activities	Increased funding and resources for R&D	Enhanced R&D capabilities with strong international and private sector partnerships
Industry Academia Collaboration	Weak collaboration between educational institutions and industry	Strengthening partnerships and collaborative research projects	Robust industry academia partnerships with practical internship programs and joint research initiatives

PESTLE Analysis of Technical and STEM Education in Pakistan

Political Factors

Frequent government changes in Pakistan lead to inconsistent education policies, hindering long-term planning and development. Stable and consistent policies are essential.

Economic Factors

High inflation and funding constraints limit investments in education infrastructure and programs, widening the gap between the current and desired state of education.

Social Factors

Cultural barriers and a lack of awareness restrict participation in STEM fields, particularly for women and minorities. Policies and outreach programs promoting diversity and raising awareness about the benefits of STEM are needed to create an inclusive educational environment.

Technological Factors

Limited integration of modern technologies into the curriculum hinders students' ability to acquire necessary skills for today's technology-driven world. Updating educational technologies and incorporating cutting-edge tools and methodologies are crucial for preparing students for the modern workforce.

Legal Factors

Weak enforcement of existing legal frameworks results in variations in educational standards and quality. Strengthening these frameworks and enhancing enforcement mechanisms are necessary to ensure high standards in education.

Environmental Factors

Inadequate infrastructure and resource limitations affect the sustainability of education programs. Developing sustainable infrastructure and integrating environmental education into the curriculum are vital to addressing these challenges.

Challenges for Pakistan

Outdated Infrastructure and Limited Funding

- Pakistan's technological and educational infrastructure is significantly outdated, impeding effective learning and innovation.
- Expenditure on R&D is only 0.22% of GDP, compared to India's 0.66% and Bangladesh's 0.39% (World Bank, 2023).
- Limited financial resources hinder the sustainability of technological initiatives and the development of advanced research facilities.

Policy and Implementation Issues

- Bureaucratic delays and inefficiencies obstruct the smooth implementation of technological policies and programs.
- Frequent political changes result in inconsistent policies, disrupting long-term planning and stability in technological and educational sectors.

Weak Industry-Academia Collaboration

- Pakistan faces weak collaboration between educational institutions and industry, unlike India, which has robust partnerships facilitating innovation and practical learning.
- Financial support for university-industry projects is often lacking, limiting collaborative innovation opportunities.

Human Capital and Training Challenges

- Pakistan allocated only 2.4% of GDP to education in 2022, compared to 3.1% in India and 2.8% in Bangladesh (UNESCO, 2023).
- Insufficient training programs for educators and significant brain drain as many trained professionals leave for better opportunities abroad.

Slow Technology Integration

- Slow integration of modern technologies into the educational system affects education quality and research capabilities.
- Initiatives like the Pakistan Education and Research Network (PERN) aim to improve digital connectivity, but broader access to high-speed internet and digital libraries remains limited.

Economic and Social Barriers

- Economic instability, including high inflation rates (21.3% in 2022), restricts investment in technological and educational infrastructure.
- Cultural barriers hinder the participation of women and underrepresented groups in STEM fields, with women making up only 18% of the STEM workforce in Pakistan compared to 30% in India and 25% in Bangladesh (World Economic Forum, 2023).

Comparative Performance

- India ranks 40th globally in the Global Innovation Index (GII) 2023, compared to Pakistan's 88th position and Bangladesh's 116th position (WIPO, 2023).
- India benefits from substantial funding, strong industry-academia partnerships, and a robust policy framework supporting sustained technological growth.
- Bangladesh has shown considerable progress in recent years, ranking higher than Pakistan in innovation inputs and outputs, effectively utilizing international partnerships to enhance its technological education and research sectors.

Interviews with Experts (Primary Sources)

Key points from Mr. Ijaz Khan (Vice President, Sarhad Chamber of Commerce):

- i. Industrial policies aim to promote trade and employment but face challenges like energy shortages and high costs.
- ii. Development of industrial and economic zones under CPEC has seen limited progress.
- iii. Lack of infrastructure, investors, and security hinders job opportunities and industrialization in KP.

Key points from Mr. Munir Gul (Director, KP TEVTA):

- i. Most industries in KP are closed or near closure, leading to reduced demand for skilled workers.
- ii. TVETA trains youth in technical skills, capitalizing on the fact that 60% of the population is young.
- iii. Around 107 technical institutions provide skill development, but 80% of trained manpower migrate abroad.

Conclusion

Pakistan faces significant challenges in advancing technological innovation and education, which are essential for its industrial development and economic growth. The country's technological and educational infrastructure is significantly outdated, impeding effective learning and innovation. Limited funding for Research and Development (R&D) exacerbates this issue, with Pakistan's expenditure on R&D at only 0.22% of its GDP, compared to India's 0.66% and Bangladesh's 0.39% (World Bank, 2023). This financial constraint impacts the development of advanced research facilities and the implementation of sustained technological initiatives. Bureaucratic delays and inefficiencies further hinder the smooth implementation of technological policies and programs. Frequent political changes lead to inconsistent policies, disrupting long-term planning and stability in the technological and educational sectors.

Human capital development is also hampered by inadequate training programs and significant brain drain, with many trained educators and researchers leaving for better opportunities abroad. In 2022, Pakistan allocated only 2.4% of its GDP to education, compared to 3.1% in India and 2.8% in Bangladesh (UNESCO, 2023). The integration of modern technologies into the educational system is slow, affecting education quality and research capabilities. Initiatives like the Pakistan Education and Research Network (PERN) aim to improve digital connectivity, but broader access to high-speed internet and digital libraries remains limited. Economic instability, characterized by high inflation rates (21.3% in 2022), restricts investment in technological and educational infrastructure. Cultural barriers also impede the participation of women and underrepresented groups in STEM fields,

with women constituting only 18% of the STEM workforce in Pakistan. Addressing the multifaceted challenges in infrastructure, policy implementation, human capital development, and technology integration is crucial for Pakistan to advance its technological and educational capabilities and achieve sustainable growth.

Recommendations

1. Policy Formulation and National Standards

- Develop comprehensive national policies for technical education and STEM, ensuring alignment with global best practices.
- Establish national standards and frameworks for curricula, teacher qualifications, and student assessments in technical and STEM education.

2. Funding and Resource Allocation

- Increase budget allocations for technical education and STEM initiatives, focusing on infrastructure development, teacher training, and research facilities.
- Provide grants and subsidies to encourage public-private partnerships (PPP) in establishing technical institutes and STEM centers.

3. National Research and Development

- Invest in national research and development (R&D) programs to drive innovation and technological advancements.
- Create a national innovation fund to support startups and research projects in STEM fields.

4. Public Awareness and Outreach

- Launch nationwide campaigns to raise awareness about the importance of technical education and STEM careers.
- Promote gender inclusivity and diversity in STEM through targeted scholarships and outreach programs for underrepresented groups.

Provincial Government Recommendations

1. Curriculum and Teacher Training

- Collaborate with federal authorities to adapt national standards to the provincial context, ensuring relevant and updated curricula.
- Implement continuous professional development programs for teachers to enhance their skills and knowledge in technical and STEM subjects.

2. Infrastructure Development

- Invest in building and upgrading technical institutes, vocational training centers, and STEM-focused schools with modern facilities and equipment.

- Ensure access to high-quality internet and digital tools in educational institutions to facilitate eLearning and digital literacy.
- 3. *Industry-Academia Collaboration***
 - Foster partnerships between local industries and educational institutions to align training programs with market needs.
 - Establish provincial innovation hubs and incubators to support students and researchers in developing and commercializing new technologies.
 - 4. *Monitoring and Evaluation***
 - Set up provincial monitoring and evaluation units to assess the effectiveness of technical education and STEM initiatives.
 - Use data-driven insights to inform policy adjustments and improvements in educational programs.

District Level Recommendations

- 1. *Local Implementation of Programs***
 - Implement provincial policies and programs at the district level, ensuring that they are tailored to local needs and contexts.
 - Establish district education offices to oversee the administration and quality control of technical education and STEM initiatives.
- 2. *Community Engagement***
 - Engage local communities, including parents, businesses, and civic organizations, in supporting and promoting technical education and STEM fields.
 - Organize local STEM fairs, competitions, and workshops to encourage student participation and interest in these areas.
- 3. *Capacity Building***
 - Provide training and resources for district education officers and school administrators to effectively manage and support technical and STEM education programs.
 - Facilitate local teacher networks and professional learning communities to share best practices and resources.
- 4. *Resource Mobilization***
 - Encourage local businesses and industries to contribute resources, such as equipment, internships, and scholarships, to support technical and STEM education.
 - Leverage district-level funds and grants to address specific local needs and gaps in educational infrastructure and resources.

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Reforming the Energy Sector and Cost Effective Sources of Energy for Industrial Development

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Abstract:

Pakistan's energy sector faces critical challenges that hinder industrial development and economic prosperity. Rising energy demand and reliance on costly imported fossil fuels strain the economy and exacerbate environmental issues. Controversial agreements with Independent Power Producers (IPPs) have led to high electricity costs, impacting industrial growth and economic stability. To address these challenges, the Pakistan Power Minister's Task Force aims to reform the energy sector through a comprehensive review of the current energy mix, infrastructure, and governance. Key strategies include promoting renewable energy, modernizing infrastructure, strengthening regulatory frameworks, and fostering public-private partnerships. Implementing policies focused on cost-effective energy sources, energy efficiency, and innovation is crucial for sustainable industrial development. The recommendations outlined include diversifying energy sources, modernizing infrastructure, enhancing regulatory oversight, and fostering research and community engagement. By pursuing these measures, Pakistan can achieve a more resilient, sustainable, and economically viable energy landscape that supports long-term industrial growth.

Key words:

Energy sector, Industrial development, Renewable energy, Regulatory reforms

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Introduction

Pakistan's energy sector is not suitable for industrial development that leads to a prosperous and economically developed nation. Energy demands are on the rise, and energy is extremely expensive, which not only negatively impacts households but also hampers industrial growth. Pakistan is heavily reliant on imported fossil fuels, which burdens the economy and affects both the environment and society. Pakistan has entered into controversial agreements with Independent Power Producers (IPPs). The Power Division has facilitated the commissioning of forty-six (46) thermal independent power projects (IPPs) with a gross capacity of 22,174 MW, but the energy they provide is extremely costly, which is detrimental to industrial development and economic growth.

To achieve sustainable industrial development and address these issues, a task force has been set up to reform the energy sector and identify cost-effective energy sources for industrial development. The Task Force is tasked with conducting a comprehensive review of Pakistan's energy sector, including its current energy mix, infrastructure, and governance structure, and identifying cost-effective energy sources, including renewable energy options, to meet the growing demands of industry and commerce. Developing a roadmap for energy sector reform, including recommendations for policy, regulatory, and institutional changes, as well as identifying potential financing mechanisms and investment opportunities to support the transition to a more sustainable energy mix, is also essential. The future of a prosperous Pakistan is directly linked to cost-effective sources of electricity, as this is directly related to industrial growth.

Problem Statement

The power sector plays a vital role in uplifting the economy and promoting industrial development in a country. Pakistan's total installed power generation capacity is 43,775 MW, with 59% of energy coming from thermal fossil fuels, which is reported to be expensive due to the import of fossil fuels. However, there is a perception that the industrial base in Pakistan is severely impacted by the power sector, resulting in the closure of several industries. Therefore, this research will examine the challenges related to the perceived energy issue, particularly its high cost and negative impact on the industrial base, and will critically evaluate and analyze the situation regarding energy sector reforms and cost-effective energy sources for industrial development.

Research methodology

The research methodology used in this study is mixed and includes data collection. It incorporates various techniques and processes used to systematically investigate the topic. Key methods include brainstorming, which fosters creative idea generation; a literature review, which synthesizes existing scholarly work to contextualize and identify research gaps; and secondary data analysis, which leverages pre-existing data for new insights. Situational analysis assesses the current state of affairs, identifying internal and external factors impacting the research area. Analyzing the legal and constitutional framework provides insights into regulatory constraints and opportunities. Comparative analysis, such as evaluating Pakistan's energy sector against global best practices, identifies areas for improvement. SWOT analysis examines strengths, weaknesses, opportunities, and threats, while PESTLE analysis explores political, economic, social, technological, legal, and environmental influences. Lastly, GAP analysis identifies discrepancies between current and desired states, guiding strategic planning and development. These methodologies collectively enable a thorough, multifaceted exploration of complex research questions. Based on the findings, a logical framework has been developed to address the challenges.

Key Findings:

After thorough research and analysis, it becomes clear that Pakistan is not an energy-deficient country but an energy-efficient and energy-surplus country. According to the National Electric Power Regulatory Authority's (NEPRA) 2022 yearly report, Pakistan's total installed power generation capacity is 43,775 MW. The breakdown of energy production in different areas of Pakistan is as follows: i. Thermal energy: 59% ii. Hydroelectric power: 25% iii. Nuclear energy: 9% iv. Wind energy, solar, and biogas: 7%

Current Energy Demand and Capacity: Current energy demand in Pakistan: 30,000 MW

Total production capacity in Pakistan: 26,000 MW

Shortfall: 4,000 MW

IPPs production capacity: 16,000 MW

SOEs: 10,000 MW

Pakistan, therefore, needs to harness cost-effective sources of energy as opposed to conventional sources, which are a waste of valuable resources and unsustainable for the country's industrial base and overall economic development. However, renewable energy sources cannot currently replace conventional power entirely due to their intermittent nature and lesser development. Thus, a balance between the two sources is required until renewable energy can fully replace conventional power.

There is an urgent need to tap into renewable energy sources and accelerate the transition due to their cost-effectiveness and sustainability. The world is rapidly moving toward renewable energy. For instance, "...the Kalyon Karapinar solar power plant is a large-scale initiative located in Turkey's central Anatolia region. It stands as the largest photovoltaic power plant in Europe and the world. This impressive project has 3.2 million solar panels across 2,000 hectares, producing enough energy to power two million homes. The climate of the site is desert-like, unsuitable for farming or living."

Literature Review

A comprehensive review of research articles and related policies reveals that the power sector in Pakistan faces numerous challenges (Kiani, 2020). Consultations with various sources and energy sector policies confirm these issues (Ministry of Energy, 2020; NEPRA, 2020). Despite an abundance of renewable energy resources, including solar, wind, hydroelectric, and biomass (Saeed et al., 2020), Pakistan's power sector is plagued by frequent power outages, energy shortages, high energy costs, dependence on fossil fuels, and inefficient energy infrastructure (Aziz, 2007; Gillani, 2010). These challenges have negatively impacted industrial growth in Pakistan (Pakistan Institute of Development Economics, 2020). However, a reformed energy sector can ensure industrial development, economic well-being, job creation, and environmental sustainability (Ali et al., 2020; Bhutto et al., 2019).

Scope of Study

To critically analyze the energy sector and cost-effective energy sources for industrial development, identify key areas requiring reform, and suggest feasible policy options. The scope will further cover the generation and distribution capacities of the power sector, including production capacities of both state-owned and private power generation companies. Different research methodologies have been adopted for various aspects of the power sector analysis. The following TORs have been considered:

- Situational analysis of the current state of the power sector.
- Analysis of the potential, issues, and contributions of Pakistan's energy sector toward industrial development and economic well-being.
- Examination of the existing legal, institutional, and policy framework for managing and regulating the energy sector.
- Comparative analysis of Pakistan's energy sector against global best practices.
- SWOT analysis of institutions responsible for producing, distributing, and regulating electricity.
- PESTLE/GAP analysis.
- Development of a practical plan using a log frame matrix to find practical and viable solutions.

Pakistan total installed power generation capacity:

According to National Electric Power Regulatory Authority's (NEPRA) 2022 yearly report, Pakistan's total installed power generation capacity is 43775 MW.

The breakdown of energy production in different areas of Pakistan is given below:

- i. **Thermal energy:** 59%
- ii. **Hydroelectric power:** 25%
- iii. **Nuclear energy:** 9%
- iv. **Wind energy, Solar and Biogas:** 7%

Some of the major IPPs with power generation capacity***Natural gas and Oil-fired Plants***

S.No	Name of power plant	location	Status	Capacity
1	Hub Power Company (HUBCO)	Baluchistan	Oil-powered	1292 MW
2	K-Electric Bin Qasim Power Station	Karachi	Natural gas & oil	1260MW
3	Fauji Kabirwala Power Company	Punjab	Natural gas	157 MW

Coal-Fired Power Plants

S.No	Name of power plant	Location	Status	Capacity
1	Port Qasim Power Plant	Karachi	Coal-fired	1320 MW
2	Sahiwal Coal Power Project	Punjab	-----	1320 MW
3	Engro Thar Block II Power Plant	Sindh	Indigenous Thar coal	660 MW

Hydroelectric Power Plants

S.No	Name of power plant	location	Status	Capacity
1	New Bong Escape Hydropower Project	Azad Jammu & Kashmir	Hydroelectric	84 MW
2	Patrind Hydropower Project	On the border of KP & AJK	-----	147 MW

Wind Power Plants

S.No	Name of power plant	location	Status	Capacity
1	Zorlu Enerji Pakistan	Sind	Wind power	56.4 MW
2	Three Gorges Second and Third Wind Farms	Sind	----- -	49.5 MW
3	Fauji Fertilizer Company Energy Limited (FFCEL) Wind Farm	Sind	----- -	49.5 MW

Solar Power Plants

S.No	Name of power plant	location	Status	Capacity
1	Quaid-e-Azam Solar Park	Bahawalpur	Solar	100 MW
2	Various small-scale solar projects	Punjab & Sind	-----	-----

State-Owned Hydro-Power Projects

The primary state-owned enterprise responsible for hydropower generation in Pakistan is the Water and Power Development Authority (WAPDA). Here are some of the major state-owned hydropower projects in Pakistan along with their capacities:

S.No	Name	Location	Status	Capacity
1	Tarbela Dam:	Khyber Pakhtunkhwa, Sawabi, Indus River		4888 MW
2	Mangla Dam:	Mirpur, AJK, Jhelum River		1000 MW
3	Ghazi-Barotha Hydropower Project	Attock, Punjab, Indus river		1450 MW
4	Warsak Dam:	Mohmand, KP, Kabul river		243 MW
5	Chashma Hydropower Project	DIKhan, Indus river		184 MW
6	Dargai Hydropower Project	Malakand, River Swat		20 MW
7	Renala Hydropower Project	Okarra, Punjab, Lower Bari doab canal		1.1 MW
8	Neelum-Jhelum Hydropower Plant	AJK	Hydro	969 MW
9	Allai Khwar Hydropower Project	Indus River Battagram		121 MW
10	Gomal Zam Dam	WANA/Tank		17.4 MW

Power Generation Companies: (Coal-fired)

S.No.	Name of GENCO	Generation Capacity
1	Jamshoro Power Company Limited (JPCL or GENCO-I)	1,024 MW.
2	Central Power Generation Company Limited (CPGCL or GENCO-II)	2,402 MW.
3	Northern Power Generation Company Limited (NPGCL or GENCO-III)	1,300 MW
4	Lakhra Power Generation Company Limited (LPGCL or GENCO-IV)	150 MW.

Current Situation**Current energy demand in Pakistan:** 30,000 MW**Total Production capacity in Pakistan:**26,000 MW**Shortfall:** 4000 MW**IPPs production capacity:** 16000 MW**SOEs:** 10,000 MW

The Task Force comprises representatives from 40th MCMC so that different perspectives could be looked into. This report presents the findings and recommendations of the Task Force, outlining a vision for a more sustainable, efficient, and cost-effective energy sector that can support Pakistan's industrial development and economic growth and aligning it with Sustainable Development Goals (SDGs).

Exploration of Policy guidelines***Energy Sector Reforms:***

The task force is working to address significant issues in the energy sector, such as inefficiencies, outdated regulations, and poor management. This initiative aims to create an environment conducive to investment and innovation through business facilitation, increased transparency, and improved collaboration (Ahmed et al., 2021).

Issues also exist with Independent Power Producers (IPPs) concerning the power sector. The Private Power and Infrastructure Board (PPIB), an autonomous body of the Power Division, Government of Pakistan (GoP), provides a one-window facility for investors in power generation and related infrastructure. While IPPs have played a crucial role in addressing Pakistan's energy shortages, a primary concern is the high cost of electricity generated by IPPs, which has contributed to the country's circular debt problem (Kiani, 2022). According to the National Electric Power Regulatory Authority (NEPRA), the cost of electricity generated by IPPs is significantly higher than that produced by public sector power plants (NEPRA, 2022).

Another issue is the uneven distribution of IPPs, with most located in Punjab, limiting access to electricity in other provinces (Ministry of Energy, 2022). This has exacerbated existing energy disparities between provinces. Additionally, IPPs have been criticized for prioritizing profit over public interest, raising concerns about their social and environmental impact (Khan, 2021).

The Power Division has successfully facilitated the commissioning of forty-six (46) independent power projects (IPPs) with a gross capacity of 22,174 MW and investments exceeding US\$ 27 billion. These projects use various fuels and technologies, including hydro, Thar coal, imported coal, RLNG/gas, and oil. However, circular debt currently stands at Rs. 2.31 trillion, approximately 5.1% of GDP.

Controversial Terms and Conditions of Agreements with IPPs and Their Negative Impacts on Industry:

A significant conflict of interest exists, as 90% of IPP contracts are owned by individuals who were either part of the cabinet or linked to decision-making processes. This raises legal concerns and could lead to the nullification of these contracts in a court of law. Additionally, purchasing electricity from international IPPs at full capacity could be considered.

These contracts are also suspected to have resulted from kickbacks, underscoring the need for transparency and accountability in the energy sector.

Controversial Points in Power-Purchase Agreements (PPA):

1. **Capacity Payments:** Contracts often guarantee payments to IPPs based on their installed capacity, regardless of actual electricity generation, leading to financial obligations even during low demand or when cheaper alternatives are available (Ali, 2017).
2. **Take-or-Pay Contracts:** Agreements typically include clauses requiring the government to pay for a specified amount of electricity, whether consumed or not, placing financial burdens on consumers and the government (Khan, 2018).
3. **Indexation of Fuel Prices:** Contracts may stipulate that fuel costs are indexed to international market prices, exposing consumers to global fuel price fluctuations and resulting in higher electricity tariffs (Ahmad & Rehman, 2020).
4. **Cost Overruns and Guarantees:** IPP contracts often include provisions for the government to cover cost overruns or provide financial guarantees, transferring risk from investors to the public sector (Majeed & Jamil, 2021).
5. **Tariff Adjustments:** Agreements may allow IPPs to adjust tariffs based on inflation, currency exchange rates, and policy changes, leading to tariff hikes and increased consumer costs (Khan & Khan, 2019).

6. **Inefficiencies and Maintenance Costs:** Contracts may lack strict provisions for monitoring and penalizing inefficiencies or poor maintenance, resulting in additional costs passed to consumers (Hasan, 2016).
7. **Non-Utilization Penalties:** Some contracts impose penalties on the government for not utilizing the agreed-upon IPP capacity, incentivizing overcapacity and higher costs (Majeed & Zaman, 2018).
8. **Lack of Transparency:** Contracts often lack transparency in pricing mechanisms, cost breakdowns, and financial arrangements, making it difficult to assess the fairness of tariffs and expenses (Hussain, 2020).
9. **Long-Term Commitments:** Contracts with lengthy durations, such as power purchase agreements spanning decades, lock consumers into high tariffs for extended periods, limiting flexibility and hindering cost reduction efforts (Shahbaz et al., 2019).
10. **Limited Competition and Monopolistic Behavior:** The dominance of a few IPPs in the market, combined with barriers to entry and limited competition, can result in monopolistic behavior and higher electricity prices (Zaidi & Mirza, 2017).

Negative Impacts:

1. **Increased Production Costs:**
 - **High Electricity Prices:** Pakistan's industrial sector faces high electricity tariffs. For example, the average industrial electricity tariff in Pakistan has been around PKR 18-20 per kWh in recent years, significantly higher compared to regional competitors like India and Bangladesh.
2. **Fuel Cost Adjustment:** Frequent adjustments in fuel prices, often passed onto consumers, lead to unpredictable costs for industries. In 2023, there were several instances where fuel cost adjustments ranged between PKR 3-5 per kWh, exacerbating cost uncertainties.
3. **Decreased Competitiveness:**
 - **Export Decline:** Higher energy costs make Pakistani products less competitive in international markets. According to the Pakistan Bureau of Statistics, textile exports, a major industrial sector, dropped by 14.7% year-on-year in 2023, partially due to high production costs.
4. **Operational Inefficiencies:** Industries face higher operational costs, reducing profit margins. A report by the Pakistan Business Council in 2022 highlighted that energy costs constitute about 30-40% of total production costs in energy-intensive industries like textiles and cement.
5. **Load Shedding and Unreliable Power Supply:**
 - **Production Losses:** Power outages cause significant production losses. In 2021, the Federation of Pakistan Chambers of Commerce & Industry (FPCCI) estimated that load shedding resulted in approximately PKR 210 billion in losses annually for the industrial sector.

6. **Increased Use of Generators:** To mitigate power outages, industries resort to using diesel generators, which are more expensive. The cost of electricity from diesel generators can be as high as PKR 35-40 per kWh, more than double the grid supply cost.
7. **Impact on Small and Medium Enterprises (SMEs):**
 - **Financial Strain:** SMEs, which account for about 30% of Pakistan's GDP, struggle with high energy costs. The Small and Medium Enterprises Development Authority (SMEDA) reports that many SMEs are forced to reduce operations or shut down due to unsustainable energy expenses.
8. **Investment in Alternatives:** Limited financial resources make it difficult for SMEs to invest in alternative energy sources like solar, which require high initial capital.
9. **Environmental and Health Costs:**
 - **Pollution from Conventional Sources:** Heavy reliance on thermal power (coal, oil, and gas) leads to significant greenhouse gas emissions. According to the Global Carbon Atlas, Pakistan emitted around 223 million tons of CO₂ in 2022, with a substantial share from the industrial sector.
 - **Health Impact:** Industrial pollution contributes to health issues, increasing healthcare costs. The World Bank estimated that air pollution costs Pakistan nearly 5.88% of its GDP, around USD 47 billion annually, in terms of health costs and lost labor.
10. **Investment Deterrence:**
 - **Reduced Foreign Direct Investment (FDI):** High energy costs and unreliable supply deter foreign investors. The State Bank of Pakistan reported a 29% decline in FDI in 2023, highlighting energy costs and supply as major concerns for investors.

Overall, the costly conventional power supply in Pakistan hampers industrial growth, reduces competitiveness, and leads to significant economic and social costs. Transitioning to more affordable and reliable renewable energy sources could mitigate these issues and foster sustainable industrial development.

Given this, there is now a need to focus on the diversification of renewable energy sources for cost-effectiveness, industrial growth, economic development, and the gradual reduction of Pakistan's dependence on fossil fuels until renewables are fully capable of replacing conventional power. Additional focus areas include enhancing energy efficiency measures, developing outdated infrastructure, promoting public-private partnerships, fostering research and innovation in the power sector, capacity building, and training to produce a skilled workforce in the energy sector. Aligning energy sector reforms and initiatives with the United Nations' Sustainable Development Goals (SDGs) will help Pakistan contribute to global efforts to achieve sustainable development, reduce poverty, and protect the environment.

The following analysis was carried out by the task force to point out issues and challenges for policy recommendations regarding reforming the energy sector and cost effective sources of energy for industrial development:
Situational Analysis of the Energy Sector in Pakistan: Potential, Issues, and Contributions

This analysis examines the current potential, issues, and contributions of Pakistan's energy sector towards industrial development and economic growth.

Potential of Pakistan's Energy Sector

Renewable Energy Sources:

Pakistan is endowed with substantial renewable energy resources, including solar, wind, hydroelectric, and biomass. The country's geographical location provides ample sunlight for solar power generation, with an estimated potential of 2.9 million MW (Saeed et al., 2020). Additionally, the wind corridors in the provinces of Sindh and Balochistan offer significant potential for wind energy, with estimates suggesting a capacity of 50,000 MW (Bhutto et al., 2019).

Hydroelectric Power:

Pakistan's topography, characterized by major rivers and tributaries, provides significant potential for hydroelectric power. The country has an identified potential of approximately 60,000 MW, of which only a fraction has been exploited (Malik et al., 2019). Large-scale hydroelectric projects, such as the Diamer-Bhasha and Dasu dams, are in various stages of development, promising to significantly enhance the energy mix.

Biomass and Waste-to-Energy:

The agricultural sector in Pakistan generates considerable biomass, which can be utilized for energy production. Biomass energy, including biogas from animal waste and crop residues, holds promise for providing decentralized energy solutions, particularly in rural areas (Ali et al., 2020). Additionally, waste-to-energy technologies can convert municipal and industrial waste into energy, contributing to sustainable waste management and energy production.

Current Situation:

Current energy demand in Pakistan: 30,000 MW

Total Production capacity in Pakistan: 26,000 MW

Shortfall: 4000 MW

IPPs production capacity: 16000 MW

SOEs: 10,000 MW

Cost of electricity per unit in different sectors in Pakistan

S. No.	Sector	Cost per unit excluding taxes (PKR per kWh)	Cost per unit including taxes (PKR per kWh)
1	Hydropower	1-2	4-6
2	Coal fired Power plant	6-8	10-12
3	Natural Gas	Domestic gas: 6-7 LNG: 10-12	Domestic gas: 9-11 LNG: 15-18
4	Nuclear	6-8	10-12
5	Oil fired Power plant	12-18	18-22
6	Wind power	5-7	8-10
7	Solar power	5-7	8-10
8	Biogas and other renewables	6-9	9-12

Power consumption Slabs:

Consumer Category	Consumption Slabs	Rate (PKR/kWh)
Residential	1-50 kWh	3.95
	51-100 kWh	7.74
	101-200 kWh	10.06
	201-300 kWh	12.15
	301-700 kWh	19.55
	Above 700 kWh	22.65
Commercial	Up to 5 kW	19.95
	Above 5 kW	20.95
Industrial	B1 (up to 25 kW)	17.95
	B2 (25-500 kW)	16.95
	B3 (above 500 kW)	15.95
	B4 (above 500 kW, off-peak)	13.45
	B4 (above 500 kW, peak)	21.45

<http://www.nepra.org.pk>

Total Number of DISCOs:

FY 2023 Losses: In the fiscal year 2022-23, DISCOs contributed to a surge in circular debt, adding Rs. 396 billion to the national total. This included Rs. 160 billion due to high losses and an additional Rs. 236 billion from under-recovery of electricity bills (Profit by Pakistan Today).

Overall Circular Debt: By June 30, 2023, the circular debt had reached Rs. 2.31 trillion, highlighting the chronic financial issues within the power sector (Profit by Pakistan Today).

DISCOs are operating at a loss and are responsible for the distribution, transmission, and management of power.

Issues:

1. **Energy Shortages:** Pakistan faces significant energy shortages, with a demand-supply gap of around 5,000 MW, resulting in frequent power outages and load shedding (Kiani, 2020).
2. **High Energy Costs:** The cost of energy in Pakistan is high, making it difficult for industries to operate efficiently and competitively (Pakistan Institute of Development Economics, 2020).
3. **Dependence on Fossil Fuels:** Pakistan's energy mix is heavily reliant on fossil fuels, contributing to greenhouse gas emissions and environmental degradation (Ministry of Climate Change, 2020).
4. **Inefficient Energy Infrastructure:** The aging and inefficient energy infrastructure leads to significant transmission and distribution losses (NEPRA, 2020).
5. **Dollar Indexation with Reference to IPP Agreements.**
6. **Rapid Increase in Circular Debt.**
7. **Long-term Contracts with IPPs.**

Contributions:

1. **Industrial Development:** A reformed energy sector can provide reliable and cost-effective energy to industries, promoting industrial development and economic growth (Kiani, 2020).
2. **Economic Well-being:** Access to affordable energy can improve the overall economic well-being of the population, reducing poverty and inequality (Pakistan Institute of Development Economics, 2020).
3. **Job Creation:** A thriving energy sector can create new job opportunities in the energy and industrial sectors (Ministry of Energy, 2020).
4. **Environmental Sustainability:** A shift towards cost-effective and renewable energy sources can reduce Pakistan's carbon footprint and promote environmental sustainability (Ministry of Climate Change, 2020).

Analysis of Pakistan's Legal, Institutional, and Policy Framework for Managing and Regulating the Energy Sector: A thorough analysis of this framework reveals key strengths, weaknesses, and areas for improvement.

Analysis of Pakistan's Legal, Institutional, and Policy Framework for Managing and Regulating the Energy Sector: A thorough analysis of this framework reveals key strengths, weaknesses, and areas for improvement.

Legal Framework:

- **Constitution of Pakistan:** Provides the foundational legal structure for governance, including the distribution of powers between federal and provincial governments. Energy is a shared responsibility, with both levels having roles in regulation and policy-making.
- **National Electric Power Regulatory Authority (NEPRA) Act, 1997:** Establishes NEPRA as the main regulatory body for electricity. NEPRA is

responsible for licensing, tariff setting, and ensuring the reliability and efficiency of the power supply.

- **Oil and Gas Regulatory Authority (OGRA) Ordinance, 2002:** Establishes OGRA to regulate the oil and gas sector, including pricing, licensing, and consumer protection.
- **Pakistan Energy Efficiency and Conservation Act, 2016:** Establishes the National Energy Efficiency and Conservation Authority (NEECA) to promote energy efficiency and conservation.
- **Alternative Energy Development Board (AEDB) Act, 2010:** Establishes the AEDB to promote renewable energy projects, including solar, wind, and biomass.
- **Environmental Protection Act, 1997:** Provides the legal framework for environmental protection, including regulations for emissions and pollution from energy projects.

Analysis of Pakistan's Legal, Institutional and Policy Framework for Managing and Regulating the Energy Sector

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Establishes OGRA to regulate the oil and gas sector, including pricing, licensing, and ensuring consumer protection.

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Establishes the National Energy Efficiency and Conservation Authority (NEECA) to promote energy efficiency and conservation.

Alternative Energy Development Board (AEDB) Act, 2010:

Establishes the AEDB to promote renewable energy projects, including solar, wind, and biomass.

Environmental Protection Act, 1997:

Provides the legal framework for environmental protection, including regulations for emissions and pollution from energy projects.

Institutional Framework Ministry of Energy:

Comprises two divisions: the Power Division and the Petroleum Division. It is responsible for policy-making, planning, and coordination of the energy sector.

National Electric Power Regulatory Authority (NEPRA):

An independent regulatory authority overseeing the electricity sector. It regulates tariffs, issues licenses, and ensures compliance with regulatory standards.

Oil and Gas Regulatory Authority (OGRA):

Regulates the oil and gas sector, including pricing, licensing, and compliance with safety and environmental standards.

Pakistan Atomic Energy Commission (PAEC):

Responsible for the development and regulation of nuclear energy for peaceful purposes, including power generation.

Alternative Energy Development Board (AEDB):

Promotes and facilitates the development of renewable energy projects.

National Energy Efficiency and Conservation Authority (NEECA):

Promotes energy efficiency and conservation measures across various sectors.

Policy Framework

The "National Electricity Plan 2023-27" outlines the strategic framework for the country's power sector over the next few years. Key features of this plan, particularly concerning Independent Power Producers (IPPs), include:

1. *Renewable Energy Focus:*

The policy emphasizes increasing the share of renewable energy in the energy mix, targeting 30% renewable capacity by 2030, which includes wind, solar, and hydroelectric power. This effort aims to reduce reliance on imported fuels and ensure sustainable energy production (Power.gov.pk; IEEFA).

2. *Least-Cost Generation Plan:*

The plan aims to adopt a least-cost generation approach, optimizing existing resources and integrating new renewable energy projects. This approach is designed to minimize the overall cost of electricity generation and reduce the financial burden on the power sector (Power.gov.pk).

3. *Circular Debt Reduction:*

A critical aspect of the policy is addressing the circular debt issue by improving the financial health of power distribution companies, enhancing billing and collection efficiencies, and reducing transmission and distribution losses (Power.gov.pk).

4. *Capacity Expansion and Overcapacity Management:*

The policy acknowledges past issues with overcapacity and aims to align future capacity expansion more accurately with projected demand. This includes revising power demand forecasts to avoid the financial strain of unused capacity (IEEFA).

5. *Hydropower Development:*

There is significant focus on hydropower projects, with large-scale developments such as the Diamer-Bhasha Dam included in the plan. These projects are expected to provide a reliable and significant share of the energy mix, though they come with high investment costs and long construction times (IEEFA).

6. *Private Sector Participation:*

The policy encourages private sector investment in the power sector, particularly through IPPs, by streamlining regulatory processes and creating a conducive environment for private investors (Power.gov.pk).

7. *Regulatory and Institutional Reforms:*

To support these strategies, the plan includes reforms in regulatory frameworks and institutional structures. This involves enhancing the capacity of regulatory bodies and ensuring transparency and accountability in the sector (Power.gov.pk).

Identification of Challenges and Areas for Improvement:

- i. Tariff Determination and Subsidies
- ii. Legal Framework for Renewable Energy
- iii. Power Theft and Non-Technical Losses
- iv. Financial Viability of Distribution Companies
- v. Capacity Building and Training
- vi. Environmental Compliance
- vii. Energy Efficiency Standards
- viii. Interagency Coordination
- ix. Investment and Financing Challenges
- x. Grid Infrastructure and Reliability
- xi. Circular debt
- xii. Capacity expansion and over capacity management
- xiii. Integration of renewable energy into the main grid

Best Practices around the world

Analysis of Pakistan energy sector by comparing it with the best practices around the world:

Pakistan's energy sector is characterized by its reliance on imported fossil fuels, aging infrastructure, and inefficiencies in governance and management. By comparing it with global best practices, we can identify key areas where reforms and improvements are needed to ensure sustainable and efficient energy production and distribution.

1. *Energy Mix and Renewable Energy Integration*

Pakistan's Current Status:

- **Energy Mix:** Pakistan's energy production is dominated by thermal energy (59%), followed by hydroelectric (25%), nuclear (9%), and renewables like wind, solar, and biogas (7%).
- **Renewable Energy Potential:** Despite significant potential for solar (estimated at 2.9 million MW) and wind energy (50,000 MW), the adoption of renewable energy sources remains limited due to financial and infrastructural challenges (Bhutto et al., 2019; Saeed et al., 2020).

Global Best Practices:

- **Germany:** Germany has successfully integrated renewable energy into its grid, achieving over 46% of its electricity from renewables in 2020. Policies like the Renewable Energy Sources Act (EEG) provided feed-in tariffs and long-term contracts that incentivized investment in renewables (BMW, 2021).

2. *Energy Efficiency and Infrastructure Development*

Pakistan's Current Status:

- **Aging Infrastructure:** Pakistan's energy infrastructure is outdated, leading to high transmission and distribution losses, frequent outages, and inefficient energy use (Malik et al., 2019).
- **Energy Efficiency:** Efforts to promote energy efficiency are in place, but implementation remains weak, limiting potential benefits (Shahbaz et al., 2020).

Global Best Practices:

- **Japan:** Japan has invested heavily in smart grid technologies and energy-efficient appliances following the Fukushima disaster, leading to significant improvements in energy efficiency and grid stability (METI, 2020).

-

3. *Governance and Regulatory Framework*

Pakistan's Current Status:

- **Regulatory Bodies:** Pakistan has multiple regulatory bodies, including NEPRA and OGRA, but suffers from coordination issues and limited enforcement capabilities (Ahmed et al., 2021).
- **Policy Implementation:** Policy implementation is often hampered by bureaucratic inefficiencies and lack of transparency (Saeed et al., 2020).

Global Best Practices:

- **United Kingdom:** The UK has a streamlined regulatory framework with Ofgem, the regulator for electricity and gas markets, ensuring transparent and efficient market operations (Ofgem, 2020).

4. *Investment and Financing Mechanisms*

Pakistan's Current Status:

- **Investment Challenges:** Attracting investment in the energy sector is challenging due to regulatory uncertainty and bureaucratic delays (Khan et al., 2018).
- **Financing Mechanisms:** Limited financing options and high capital costs hinder the development of renewable energy projects (Pakistan Institute of Development Economics, 2020).

Global Best Practices:

- **China:** China has become a global leader in renewable energy investment through strong government support, subsidies, and favorable financing terms for renewable projects (IEA, 2021).
- **India:** India's National Solar Mission offers various financial incentives and has established clear policies to attract domestic and international investment in solar energy (MNRE, 2020).

Lessons Learned:

1. Heavy investment in smart grid technologies and energy-efficient appliances.
2. Streamlining the regulatory framework to avoid overlap.
3. Strong incentivization of renewable resources.

SWOT analysis of Pakistan’s energy sector related institutions responsible for producing, distributing electricity and regulating the sector

Strengths	Weaknesses
<ul style="list-style-type: none"> • Diverse Energy Mix: Pakistan’s energy sector benefits from a diverse mix, including thermal, hydroelectric, nuclear, and renewable sources (NEPRA, 2022). • Regulatory Framework: The existence of multiple regulatory bodies, such as NEPRA (National Electric Power Regulatory Authority) and OGRA (Oil and Gas Regulatory Authority), provides a structured oversight mechanism (NEPRA, 2022). • Renewable Energy Potential: High potential for solar and wind energy, particularly in regions with abundant sunlight and wind resources (Bhutto et al., 2019). • Government Initiatives: Government initiatives aimed at promoting renewable energy and energy efficiency indicate a strategic focus on sustainable energy development (Ali et al., 2020). 	<ul style="list-style-type: none"> • Institutional Overlap and Coordination Issues: Overlapping responsibilities among regulatory bodies like NEPRA, OGRA, and AEDB (Alternative Energy Development Board) lead to coordination challenges (Ahmed et al., 2021). • Aging Infrastructure: Outdated and insufficient infrastructure, including power plants and transmission lines, results in frequent outages and high transmission losses (Malik et al., 2019). • Inefficiency and Governance Issues: Inefficiencies in management and governance, coupled with bureaucratic hurdles, impede effective implementation of energy policies (Shahbaz et al., 2020). • Financial Constraints: Limited financial resources and investment in the energy sector restrict the development and maintenance of infrastructure (Khan et al., 2018).
Opportunities	Threats
<ul style="list-style-type: none"> • Investment in Renewable Energy: Opportunities to attract local and international investment in solar, wind, and other renewable energy projects (IEA, 2020). • Public-Private Partnerships (PPPs): Potential to leverage PPPs for infrastructure development and innovation in the energy sector (Kumar & Katoch, 2014). • Technological Advancements: Adoption of smart grid technologies and energy-efficient appliances to improve energy management and reduce wastage (Ali et al., 2020). • Capacity Building: Initiatives for training and skill development to build a competent workforce in the energy sector (Saeed et al., 2020). 	<ul style="list-style-type: none"> • Political and Economic Instability: Political turmoil and economic instability pose significant risks to the energy sector’s development and sustainability (Ahmed et al., 2021). • Environmental Concerns: Environmental challenges, including pollution from thermal power plants, and water scarcity affecting hydroelectric power generation (Bhutto et al., 2019). • Security Issues: Security threats in certain regions can disrupt energy production and distribution, affecting overall sector stability (Malik et al., 2019). • Global Energy Market Volatility: Fluctuations in global energy prices, particularly for imported fuels, impact the cost of energy production and the broader economy (IEA, 2020).

PESTLE Analysis of Pakistan’s Energy Sector

Political	Economic	Social	Technological	Legal	Environmental
Strengths: Government initiatives for renewable energy promotion	Strengths: Diverse energy-mix reducing dependence on imports.	Strengths: Growing awareness of environmental sustainability	Strengths: Potential for technological advancements in renewable energy.	Strengths: Regulatory framework for energy sector oversight.	Strengths: Renewable energy potential, such as solar and wind.
Weaknesses: Political instability affecting policy continuity.	Weaknesses: Financial constraints limiting infrastructure investment.	Weaknesses: Limited access to electricity in rural areas.	Weaknesses: Insufficient investment in research and development.	Weaknesses: Inconsistent enforcement of regulations.	Weaknesses: Environmental degradation from fossil fuel usage.
Opportunities: Policy reforms for energy sector development.	Opportunities: Investment in renewable energy projects.	Opportunities: Community engagement for renewable energy projects.	Opportunities: Adoption of smart grid technologies.	Opportunities: Strengthening legal frameworks for renewable energy.	Opportunities: Mitigation of climate change impacts through renewable energy.
Threats: Political interference impacting regulatory autonomy.	Threats: Global energy market volatility affecting prices.	Threats: Social resistance to infrastructure development projects.	Threats: Technological obsolescence of existing infrastructure.	Threats: Legal challenges to energy project implementation.	Threats: Natural disasters affecting energy infrastructure.

GAP Analysis

1. Energy Mix and Diversification:

Current State: Pakistan relies heavily on thermal power (59%) and has limited renewable energy (7%) (NEPRA, 2022).

Desired State: Increase the share of renewable energy to reduce dependence

on fossil fuels and enhance sustainability.

Gap: Lack of sufficient incentives and investments in renewable energy projects.

2. Regulatory and Institutional Framework:

Current State: Multiple regulatory bodies with overlapping responsibilities and coordination issues (Ahmed et al., 2021).

Desired State: A streamlined regulatory framework with clear roles and efficient coordination among institutions.

Gap: Institutional overlap and lack of clear delineation of responsibilities.

3. Infrastructure Development:

Current State: Aging and inefficient infrastructure leading to frequent outages and high transmission losses (Malik et al., 2019).

Desired State: Modern, resilient, and efficient energy infrastructure capable of supporting industrial growth.

Gap: Inadequate investment in infrastructure modernization and maintenance.

4. Public-Private Partnerships (PPPs) and Investment:

Current State: Limited PPPs due to regulatory and bureaucratic challenges (Khan et al., 2018).

Desired State: Increased private sector participation and investment in energy projects.

Gap: Need for more favorable regulatory and business environments to attract private investments.

5. Research and Innovation:

Current State: Limited focus on and funding for research and innovation in energy technologies (Ali et al., 2020).

Desired State: Strong emphasis on research and development (R&D) to drive technological advancements and energy efficiency.

Gap: Insufficient support for R&D and innovation initiatives.

6. Capacity Building:

Current State: Workforce in the energy sector lacks adequate training and skills (Saeed et al., 2020).

Desired State: A skilled and competent workforce capable of managing and operating modern energy systems.

Gap: Need for enhanced training programs and skill development initiatives.

Conclusion

The Pakistan Power Minister's Task Force has embarked on a comprehensive initiative to reform the nation's energy sector, addressing industries' woes due to expensive power, structural inefficiencies, regulatory shortcomings,

and operational challenges. The primary focus is on tapping cost-effective energy sources, enhancing energy efficiency, reliability, and environmental sustainability. The task force's efforts include modernizing the energy infrastructure, promoting renewable energy, and ensuring fiscal sustainability. Additionally, identifying and utilizing cost-effective energy sources for industrial development are crucial for fostering economic growth and energy resilience in Pakistan.

Issues and Challenges

1. High energy costs due to the reliance on fossil fuels by most of the Independent Power Producers (IPPs).
2. Slow uptake of smart grid technologies and energy management systems.
3. Aging power plants, transmission lines, and distribution networks, resulting in high losses and unreliable energy supply.
4. Lack of development in decentralized energy solutions for rural regions.
5. Overlapping regulations and poor coordination among regulatory bodies.
6. Absence of a unified controlling entity to oversee energy sector regulation.
7. Underutilization of Public-Private Partnerships (PPPs) to leverage private investment and expertise.
8. A workforce lacking the necessary skills to manage and operate modern energy systems.
9. Inadequate alignment of energy sector reforms and initiatives with the United Nations' Sustainable Development Goals (SDGs).
10. Poor awareness campaigns on energy conservation and the benefits of renewable energy.
11. Limited partnerships to develop relevant curricula and enhance skills training.
12. Absence of supportive policies, such as Germany's feed-in tariffs, to encourage renewable energy investment.
13. Policy ambiguity and instability that discourage investment, unlike the clear frameworks in China and India.
14. Inconsistent tariff determination and unsustainable subsidies, leading to financial losses.
15. Difficulty attracting investment due to regulatory uncertainties and financial risks.
16. Lack of renegotiation of existing agreements with IPPs.
17. Absence of a standard template for future IPP agreements.
18. Failure to ensure competitive and transparent bidding processes.
19. Non-alignment of capacity payments with actual generation capacity.
20. Lack of burden-sharing of Transmission and Distribution (T&D) losses among IPPs, DISCOs, and the government.
21. Limited public accessibility to IPP agreements, leading to non-transparency and lack of accountability.
22. Failure to audit IPP agreements to identify irregularities or excess payments.

23. Capacity payments not tied to actual performance and availability of electricity.

Recommendations

By implementing the following policy recommendations, Pakistan can develop a sustainable, efficient, and cost-effective energy sector that supports industrial development and economic growth while contributing to global efforts in environmental sustainability:

S# No.	Policy Recommendations	Action By	Timeline
1	Diversification of Energy Sources: <ul style="list-style-type: none"> • Increase the share of renewable energy in the energy mix by providing incentives such as tax breaks and guaranteed prices. • Facilitate investment in solar, wind, hydroelectric, and biomass energy projects. 	Federal /Provincial Govt. NEPRA and AEDB	Medium Term
2	Enhancement of Energy Efficiency: <ul style="list-style-type: none"> • Implement and enforce energy-efficient standards for appliances, buildings, and industrial processes. • Promote the adoption of smart grid technologies and energy management systems. 	Federal /Provincial Govt. NEPRA and AEDB	Medium Term
3	Infrastructure Modernization: <ul style="list-style-type: none"> • Invest in upgrading and expanding power plants, transmission lines, and distribution networks to reduce losses and ensure reliable energy supply. • Develop infrastructure to support decentralized energy solutions, particularly in rural areas. 	Federal /Provincial Govt. for action as per PPP Policy. Ministry of Planning /development Donors and International funding	Long Term
4	Strengthening Regulatory Frameworks: <ul style="list-style-type: none"> • Streamline the regulatory framework to eliminate overlaps and enhance coordination among regulatory bodies. • A central controlling autonomous body be established 	Federal /Provincial Govt. NEPRA	Long Term
5	Investment Facilitation: <ul style="list-style-type: none"> • Create a conducive environment for private sector participation through clear policies, reduced bureaucratic hurdles, and attractive financing options. • Explore public-private partnerships (PPPs) to leverage private investment and expertise. • Amendments in rules/policies be made. 	Federal and Provincial Government, AEDB Ministry of Commerce & Industry	Long Term

6	Research and Innovation: <ul style="list-style-type: none"> Establish research centres and innovation hubs focused on energy technologies, grid management, and energy storage. Provide funding and support for research and development (R&D) initiatives in renewable energy and energy efficiency. 	Federal and Provincial Government, Ministry of Science & Technology	Short Term
7	Alignment with Sustainable Development Goals (SDGs): <ul style="list-style-type: none"> Ensure that energy sector reforms and initiatives are aligned with the United Nations' Sustainable Development Goals (SDGs) to promote sustainable development, reduce poverty, and protect the environment. 	Federal and Provincial Government, AEDB	Long Term
8	Community Engagement: <ul style="list-style-type: none"> Engage local communities in renewable energy projects to ensure acceptance and participation. Implement awareness campaigns to educate the public on energy conservation practices and the benefits of renewable energy. Policies be formulated. 	Federal and Provincial Government, Ministry of Information	Medium Term
9	Rural Electrification: <ul style="list-style-type: none"> Prioritize rural electrification to increase access to electricity and support regional development. 	Federal and Provincial Government	Medium Term
10	Knowledge Sharing: <ul style="list-style-type: none"> Facilitate knowledge sharing and technology transfer to drive innovation in the energy sector. 	Federal and Provincial Government	Medium Term
11	Educational Partnerships: <ul style="list-style-type: none"> Collaborate with educational institutions to develop relevant curricula and enhance skills training. 	Federal and Provincial Government, Pakistan Engineering Council	Medium Term
12	Policy Incentives: <ul style="list-style-type: none"> Implement policies similar to Germany's feed-in tariffs to encourage investment in renewable energy. 	Federal and Provincial Government	Long Term
13	Tariff Determination and Subsidies: <ul style="list-style-type: none"> Establish a clear and transparent tariff-setting mechanism that reflects the true cost of power generation, transmission, and distribution. 	Federal and Provincial Government NEPRA	Long Term
14	Investment and Financing Challenges: <ul style="list-style-type: none"> Improve the investment climate by providing clear, consistent policies and guarantees. Develop financial instruments and incentives to attract both domestic and international investors. 	Federal and Provincial Government	Medium Term

15	Renegotiate existing agreements with IPPs: <ul style="list-style-type: none"> Review and renegotiate existing contracts to ensure fair and competitive pricing, removing undue advantages and ambiguities. 	Government of Pakistan, CPPA	Long Term
16	Standardize future agreements: <ul style="list-style-type: none"> Develop a standardized template for future IPP agreements, incorporating best practices, transparency, and clarity. 	Government of Pakistan	Long Term
17	Competitive bidding: <ul style="list-style-type: none"> Introduce competitive bidding processes for new IPP projects, ensuring fair competition and market-driven pricing. 	Government of Pakistan	Long Term
18	Public disclosure: <ul style="list-style-type: none"> Make IPP agreements and related information publicly accessible, promoting transparency and accountability. 	Ministry of Power and Energy	Short Term
19	Transparency and Accountability: <ul style="list-style-type: none"> Audit Existing Agreements: Conduct a comprehensive audit of existing IPP agreements to identify any irregularities or excessive payments. 	Government of Pakistan	Short Term
20	Capacity Payments and Performance Guarantees of IPPs: <ul style="list-style-type: none"> Performance-Based Payments: Link capacity payments to actual performance and availability of electricity. 	Government of Pakistan	Mid Term
21	<ul style="list-style-type: none"> Night markets should be closed by 8 pm, similar to EU and China. 	Govt. of Pakistan through district administration	Short term
22	<ul style="list-style-type: none"> All factories, tube wells, and home cooking should be converted to solar power. 	AEDB	Long term
23	<ul style="list-style-type: none"> EV charging infrastructure should be powered by solar panels. 	GoP	Medium term
24	<ul style="list-style-type: none"> Existing taxis (Suzuki Mehran and others) should be converted to electric vehicles by installing EV kits. 	Federal & Provincial govt.	Medium term
25	<ul style="list-style-type: none"> High-end consumers should be incentivized to adopt electric vehicles, with heavy taxation on petrol to discourage its use. 	GoP	Long term

Log Frame Matrix for Energy Sector Development in Pakistan

Overall Goal:

Reform Pakistan's energy sector to ensure efficiency, reliability, and sustainability while promoting cost-effective energy sources for industrial development.

S#	<i>Proposed actions</i>	<i>Responsibilities</i>	<i>Resources</i>	<i>Timeline</i>	<i>KPIs</i>
1	Increased adoption of renewable energy	NEPRA / AEDB reports, renewable energy project data	Government policy documents	3 months	Percentage increase in renewable energy capacity
2	Enhanced energy infrastructure	Ministry of Power & Energy	Project reports, site inspections	1 year	Number of modernized power plants and transmission lines
3	Financial incentives for investors	GoP/ AEDB	Investment policy documents	6 months	Number of financial incentives introduced for investors
4	Financial strategy development	GoP/ concerned Ministry through State Bank of Pakistan	Strategy documents, funding agreements	6 months	Development of financial strategies, funding secured
5	Stakeholder engagement	Ministry of power & Energy	Meeting attendance records	3 months	Number of stakeholder meetings

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PPP Mode for Industrial and Infrastructural Development

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Abstract:

This study examines the role of Public-Private Partnerships (PPPs) in driving Pakistan's industrial and infrastructural growth. By combining public oversight with private funding and expertise, PPPs address resource constraints, enhance service delivery, and boost economic activities. However, challenges such as complex legal frameworks and political risks hinder their effectiveness. In Pakistan, limited fiscal capacity and rising socioeconomic demands underscore the need for PPPs, particularly under initiatives like the China-Pakistan Economic Corridor (CPEC). Focusing on Khyber Pakhtunkhwa, the study uses qualitative methods, including field visits and interviews, to analyze 108 projects worth \$28.4 billion executed between 1990 and 2019, primarily in energy. Examples like the Karachi-Hyderabad Motorway illustrate PPPs' potential for economic growth, job creation, and innovation. Recommendations include strengthening the PPP framework through legal clarity, risk-sharing mechanisms, international collaboration, and public engagement to ensure sustainable development and investment attraction.

Key words:

Public-Private Partnerships, Infrastructure development, Economic growth, Risk mitigation, Pakistan

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Introduction

Public-Private Partnerships (PPPs) are tools that combine public and private sector resources, expertise, and knowledge to develop infrastructure, boost economic activities, or deliver public services efficiently and effectively. In PPPs, the government provides regulatory oversight, resources, and sometimes financing, while the private sector contributes funding, technical expertise, and management capabilities. PPPs can be applied across various sectors, including social infrastructure, healthcare, energy, and water.

Globally, PPPs are recognized for enhancing resource utilization, increasing efficiency, fostering innovation, and improving service quality while sharing risks. However, challenges such as complex legal frameworks, political risks, and potential conflicts of interest persist. Success depends on careful planning, clear execution, and trust-building with the private sector, ensuring investment security and incentivized returns over the short, medium, and long term. The flow chart of PPP is shown in Fig. 1.

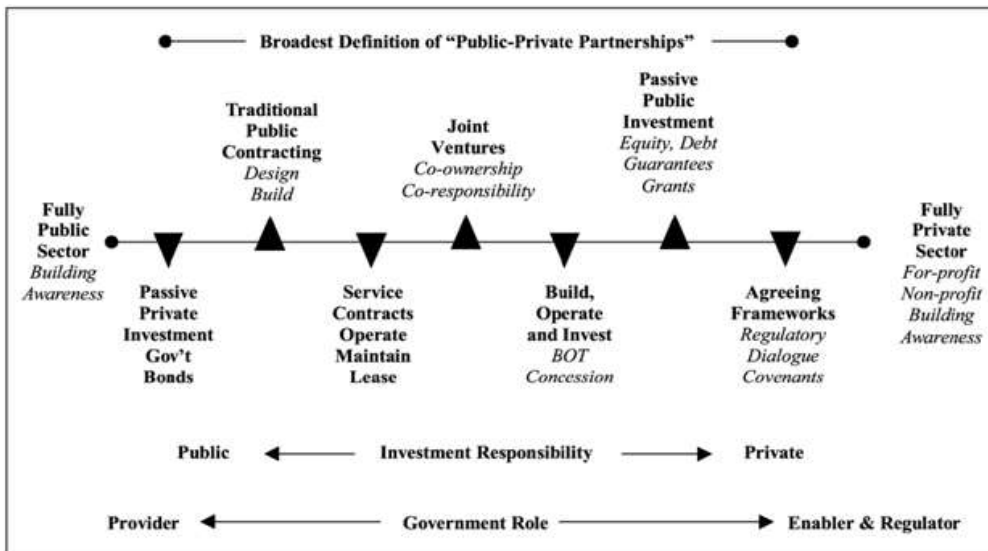


Figure 1: Flow Chart of PPP

In Pakistan, limited fiscal capacity due to a narrow tax base, high debt servicing, defense spending, and other expenses, coupled with 1.8% annual population growth, underscores the need to expand infrastructure and economic zones, particularly under the CPEC project. Despite challenges in funding and resource allocation, PPPs offer a viable solution to bridge resource gaps and address rising socioeconomic demands.

Problem Statement

Pakistan urgently needs robust infrastructure to support its growing population and economic development. Public-Private Partnerships (PPPs) have emerged as a viable solution to address the infrastructure gap. However, challenges in implementing and managing PPPs hinder their effectiveness. Overcoming these challenges is critical to unlocking the full potential of PPPs and driving sustainable industrial and infrastructure development in the country.

Literature Review

Data for this research was collected from scholarly articles and relevant policies, which provided insights into issues affecting PPP models in Pakistan, with a particular focus on Khyber Pakhtunkhwa (KP). This analysis highlights intervention strategies, effective resource utilization, and the impact of policy interventions. Legal and institutional frameworks define the government's efforts to initiate and strengthen PPPs.

A qualitative research methodology was employed. Secondary data from online sources was analyzed to establish a foundational understanding, which informed the identification of key stakeholders. Field visits were conducted to engage stakeholders, such as the PPP Unit in the Planning & Development Department of the Government of Khyber Pakhtunkhwa. Responses were gathered through semi-structured questionnaires and telephonic interviews.

Stakeholder Analysis

Public-Private Partnerships (PPPs) in Pakistan have gained momentum as an effective mechanism to foster industrial growth and economic prosperity. This collaborative approach combines public oversight with private-sector efficiency to address infrastructure deficits, improve service delivery, and stimulate economic development. Successful PPP initiatives in sectors such as energy, transportation, healthcare, and education demonstrate their potential to attract investments, integrate advanced technologies, and enhance operational management.

From 1990 to 2019, Pakistan initiated 108 PPP projects, attracting investments totaling approximately \$28.4 billion. Of this, \$24.7 billion was invested, with around 88% directed towards the energy sector, followed by investments in the port industry (Asian Development Bank, 2021).

PPP Models & Their Applicability to Pakistan

Public-Private Partnership (PPP) contracts vary in model, primarily based on funding mechanisms and the distribution of responsibilities between public and private sectors. These models specify which partner is responsible for financing, ownership, and asset maintenance across different project phases.

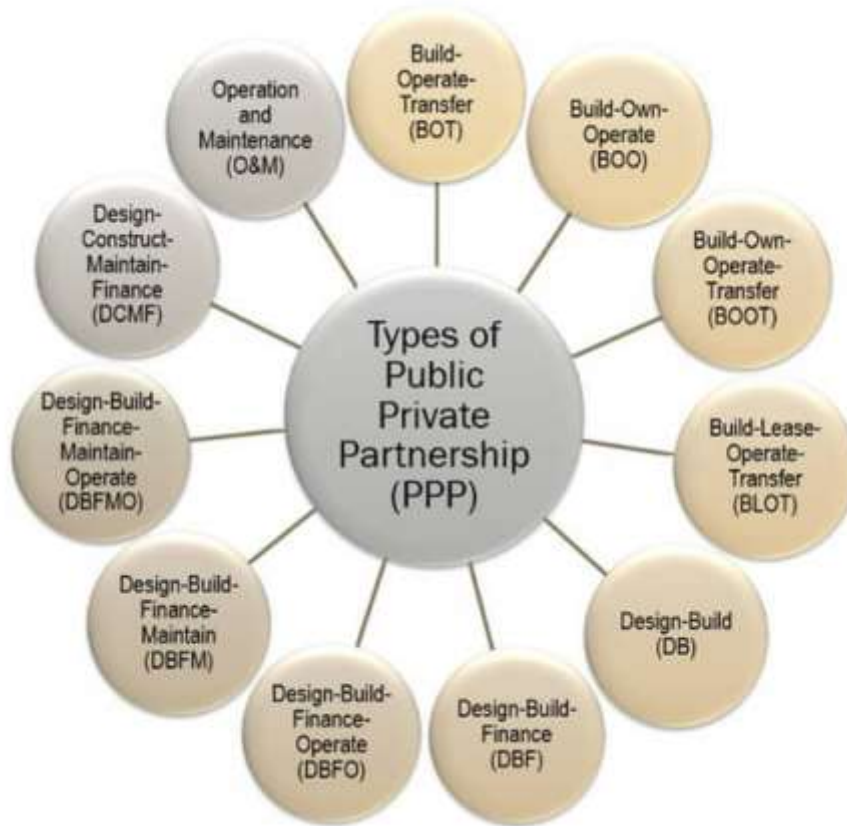


Figure 2 Types of PPP Models

The following PPP Models have been in practice in Pakistan.

Build-Operate-Transfer (BOT)

Under this model, a private sector organization plans, develops, and operates a project for a predetermined period before transferring ownership and management to the public sector partner. This approach is commonly applied to infrastructure initiatives such as toll highways, airports, and water treatment facilities.

An example is the Dualization of Sheikhpura-Gujranwala Road, which begins at Pir Bahar Shah Chowk, Sheikhpura, and leads to Gujranwala. The project spans 43 km, with 2-lane dual carriageways, bridges, and toll plazas. It cost PKR 5.241 billion and operates under a 25-year concession period, including a 2-year construction phase. The toll-based fee structure incorporates revenue sharing, and the project became operational on August

14, 2023 (Dualization of Sheikhpura-Gujranwala Road, 2022).

Another example is the Karachi Hyderabad Motorway, a conversion of the 136 km Super Highway into a 6-lane controlled-access motorway at a cost of \$430 million. Awarded in March 2015, the project operates under a 25-year concession period, including 2.5 years for construction. It is expected to generate \$1.43 billion for the National Highway Authority (NHA) over the concession period and is currently in operation (P3A, Public Private Partnership Authority, 2024).

Design-Build-Finance-Operate (DBFO)

Under this model, the private sector is responsible for designing, constructing, and operating the project for a specific period before transferring it to the public sector. This approach is often used for large-scale infrastructure projects like power plants and airports.

The Swat Expressway-I (M-16) Phase 1 was completed in 2019, costing USD 120 million. Phase 2, spanning 79 km, was approved in 2020 with PKR 20 billion allocated for land acquisition. Swat-I operates under a DBFO model, with 50% of the funding provided as viability gap funding (VGF), including a PKR 5.5 billion grant and PKR 11.5 billion loan (pkha.gov.pk, 2024).

The Ministry of Information & Broadcasting (MoIB) has outsourced its properties in Islamabad for commercial use under the DBFO model. The project involves a private entity implementing and operating the facilities for 20 years, including a 3-year construction period (P3A, Public Private Partnership Authority, 2024).

Operation and Maintenance (O&M)

In this model, the public sector retains ownership and management while the private sector oversees operation and maintenance.

The Pakistan Civil Aviation Authority (CAA) has engaged the International Finance Corporation (IFC) for transaction advisory services to outsource operations and maintenance of Islamabad International Airport. The initiative, approved by the P3A Board, aims to improve service quality and operational efficiency (P3A, Public Private Partnership Authority Working Party Rules, 2021).

Management Outsourcing Model

In this model, the public sector retains asset ownership while outsourcing management and operations to a private entity. This arrangement leverages private-sector expertise in efficiency and innovation through performance-based contracts.

The District Headquarters Hospital Dasso, constructed in 2020, began operations under a PPP on April 1, 2022. The partnership involves the Khyber Pakhtunkhwa Health Department and the National Integrated Development Agency (NIDA), which manages operations and provides advanced medical services previously unavailable in the region (SEED, n.d.).

Lease-Develop-Operate (LDO)

Under this model, a public asset is leased to a private entity for development and operation over a specific period before being returned to the public sector. The Dhabeji Special Economic Zone (DSEZ) in Thatta, Sindh, spans 1,530 acres and operates under the CPEC framework. The project, implemented in two phases, includes a 20-year concession term, with 5 years for construction and 15 years for operations and maintenance. Revenues are generated through sub-leasing plots to enterprises (DSEZ, 2023).

Design-Build-Operate (DBO)

In this model, the private sector designs, builds, and operates the project for a specified period before transferring it to the public sector. It is commonly used for projects like power plants and airports.

Build-Own-Operate-Transfer (BOOT)

Similar to the BOT model, this approach allows the private sector to retain ownership of the project for a specified period before transferring it to the public sector. It is often used in infrastructure projects such as power plants and waste management facilities.

Potential of PPPs in Industrial Development

Economic Growth and Industrialization

Industrial Base Expansion

PPPs can significantly enhance Pakistan's industrial base by attracting investment, leveraging private sector efficiency, and fostering innovation.

Job Creation

The development of industrial zones and clusters through PPPs can generate substantial employment opportunities.

Technological Advancement

Collaboration with private entities can introduce advanced technologies and management practices, boosting productivity.

Infrastructure Development

Special Economic Zones (SEZs)

Establishing SEZs through PPPs can provide the necessary infrastructure and regulatory frameworks conducive to industrial growth.

Transportation and Logistics

PPPs can develop critical infrastructure such as roads, ports, and railways, improving connectivity and reducing logistical costs.

Investment Attraction

Foreign Direct Investment (FDI)

PPPs can attract FDI by reducing risks associated with large-scale investments

and ensuring sustainable project implementation.

Domestic Investment

Engaging local private firms in PPPs can stimulate domestic investment and entrepreneurship.

Economic Impact

GDP Growth

PPP projects contribute to GDP growth by enhancing industrial output and efficiency.

Export Enhancement

Improved industrial infrastructure and capacity bolster export competitiveness, particularly in textiles and apparel.

Technological and Skills Development

Technology Transfer

Partnerships with foreign firms often include technology transfer, enhancing local capabilities.

Skills Development

PPP projects frequently involve training programs, improving the skill set of the local workforce.

Analysis of Government Initiatives and Policies:

This section examines government initiatives and policies in the Public-Private Partnership (PPP) sector, highlighting their current status and effectiveness in fostering collaboration between public and private entities to drive economic development and infrastructure improvements.

CPEC and Special Economic Zones (SEZs)

The China-Pakistan Economic Corridor (CPEC) serves as a cornerstone of Pakistan's strategy to enhance infrastructure and industrial capacity. Numerous SEZs are being developed under CPEC, where PPPs play a vital role in infrastructure and operational development. The government has introduced incentives, including tax holidays and one-window operations, to attract private investments into these zones.

National and Provincial PPP Frameworks

Pakistan has established robust legal and institutional frameworks to facilitate PPPs. The Public Private Partnership Authority (PPPA) at the federal level and similar bodies at the provincial level promote and regulate PPP projects. These frameworks aim to ensure transparency, effective risk-sharing, and mutual benefits for all stakeholders.

Sectoral Development

Energy Sector

PPPs have played a crucial role in addressing Pakistan's chronic energy shortages. Projects like the Thar Coal Power Plant and renewable energy initiatives have seen significant private sector involvement. Policies to attract investment in solar, wind, and hydropower projects have further strengthened this sector.

Infrastructure

Transportation infrastructure has experienced substantial PPP activity, including projects like the Karachi Circular Railway and Lahore Orange Line Metro Train. Efforts to modernize ports and logistics hubs continue, essential for boosting trade and industrial activities.

Industrial and Technological Parks

PPPs are driving the development of industrial and technology parks to foster innovation and industrial growth. These parks aim to attract foreign direct investment (FDI) and support local SMEs.

Contribution of PPPs to the Economic Development of Pakistan

Traditionally, PPPs in Pakistan have been particularly prevalent in the energy, power generation, and transportation sectors. In the fiscal year 2019–2020, 17 infrastructure projects involving private investment reached financial closure. The power sector accounted for the largest investment share, with a total investment amount of US\$5 billion. In recent years, however, the government has demonstrated a commitment to expanding PPPs into various other sectors, including aviation, technology, healthcare, tourism, and more. In late 2019, the Prime Minister approved a development plan, expected to run from fiscal year 2020–2023, termed the Public Sector Development Program Plus (PSDP+) initiative, which firmly oriented the government towards PPPs across multiple sectors.

In addition to the federal initiative, each of the four provinces – Sindh, Punjab, Balochistan, and Khyber Pakhtunkhwa – has its own specific roster of projects and policies to promote PPPs.

From 1990 to 2019, a total of 108 infrastructure projects involving private investments reached financial closure. The energy sector accounted for 88% of these projects, with the remaining 12% spread across ports, information and communication technology (ICT), airports, and waste disposal sectors. Of these projects, only one in the energy sector faced distress by 2020. The total investment in the 108 PPP projects is approximately \$28.4 billion (PRs 4.40 trillion at the end of 2019) (Asian Development Bank, 2021).

PPPs are also increasingly prevalent at the provincial level. In July 2020, the Chief Minister of Punjab announced that several new PPPs would be initiated,

including a clean drinking water project in Lahore, a vehicle fitness testing systems project, and a zero-waste material recovery project. By the end of the year, the Asian Development Bank and the government of Punjab had signed a memorandum of understanding to jointly promote PPPs in the healthcare sector. Sindh has multiple ongoing projects, including the Dhabeji Special Economic Zone project and the Education Management Organizations (EMO) project. The EMO project aims to outsource the management of public schools to credible organizations in the education sector, while the Dhabeji project focuses on fostering economic development in a rural part of the province (Munir, 2022).

The transport and energy sectors have seen the most PPP activity, with projects such as the Thar Coal Power Plant and the Lahore Metro Bus System. More recent expansions include initiatives in education (e.g., PIMS Medical College), technology (National Science & Technology Park), and waste management (Lahore Waste Management Company) (Gillette, 2023).

Legal Framework & Institutional Arrangements

Legal Framework

A brief description of the legal and institutional framework of the PPP mechanism in Pakistan is given in the below table-I:

Table 1 Types of PPP in Pakistan (Asian Development Bank, 2021)

Types of PPP in Pakistan (Asian Development Bank, 2021)	
Province	Type of PPP
Federal Govt	Build-operate-transfer, build-own-operate-transfer, design-build-finance-operate, and any other variant of PPP.
Punjab	Build-transfer, build-lease-transfer, build-operate-transfer, build-own-operate, build-own-operate-transfer, build-transfer-operate, contract-add-operate, develop-operate-transfer, joint venture, management contract, rehabilitate-operate-transfer, rehabilitate-own-operate, and service contract
Sindh	Build-operate-transfer, design-build-finance-operate, and any other variant of PPP. Additionally, the following modes are identified in Part IV of the Sindh Public Procurement Rules 2010: service contract, management contract, lease contract, build-own-operate, build-own-operate-transfer, build-lease-transfer, build-transfer, rehabilitate-operate-transfer, and any combination or variation of the above modes or any other arrangement under PPP mode
Khyber Pakhtunkhwa	Build-operate-transfer, build-own-operate-transfer, design-build-finance-operate, and any other variant of PPP.

The below table provides a comparison of the legal and institutional framework of the PPP mechanism at the federal and provincial levels in Pakistan.

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S. #	Jurisdiction	Level of sophistication	Gap analysis	Level of maturity
1.	Federal Government	The Public Private Partnership Authority (P3A) works as the PPP Unit at the federal level. The Infrastructure Project Development Facility (IPDF) was redesignated in 2018 as the PPP Authority under the P3A Act enacted in 2017. Overall, the legal and institutional framework is largely complete and most of the processes are defined.	P3A Act is quite bureaucratic and involves multiple layers of approvals. Moreover, the departments do not have adequate capacities to identify, screen, prepare, and implement projects in PPP mode. IPDF used to engage low-quality advisors previously and therefore several transactions were not well-structured. Moreover, for the longest time, IPDF performed coordination functions and was less focused on structuring and executing transactions.	The authority has processed multiple toll road projects and is currently undertaking projects in multiple sectors including airports, railways, water supply, real estate development, and education among others.
2.	Sindh	Sindh PPP Unit was established after the enactment of the Sindh PPP Act 2010. It is a reasonably staffed entity with experience in processing transactions in the transport, education, water supply, and water sanitation sectors among others. The Unit has been operating under a well-established legal framework. From the onset, the	High employee turnover is an issue that has been faced by the Unit for quite some time. Currently, there is a cumbersome procedure to renew contracts with little consideration for talent retention. Another major issue faced by the Unit is the lack of capacities at the level of departments/ PPP Nodes. The majority of the departments do not have PPP Nodes	Sindh PPP Unit has streamlined its appraisal, approvals, and monitoring processes. The Unit has been operational for more than 14 years and now has the institutional memory of appraising and procuring projects in

		Asian Development Bank, FCDO, and USAID have assisted in the institutional development of the PPP ecosystem in Sindh.	established and lack professionals who could lead the PPP transactions.	multiple sectors.
3.	Khyber Pakhtunkhwa	The PPP Committee headed by the Chief Minister KP oversees the overall PPP policy, approves significant projects, and ensures alignment with provincial priorities while the PPP Unit in P&DD acts as the technical arm. The PPP Act 2020 provides the inclusion of sectoral experts to inform decisions made by the Unit vis-à-vis viability of the project.	PPP Unit's staffing remains a major impediment. Moreover, for quite some time, the government did not engage renowned consultants on the transactions which resulted in suboptimal structuring of transactions undertaken in the beginning. PPP Nodes at the department level are poorly organized and cannot conceive, screen, prepare, deliver, and manage PPP projects. Overall, the commercial acumen to conceive, and structure PPP transactions has been a major issue.	Although the PPP Unit has passed the stage of infancy, however, maturity in terms of decision-making is still missing. Moreover, the understanding of overall project processing, liabilities, and commercial terms is lacking and needs to be consolidated.
4.	Punjab	The PPP regime in Punjab was supported by ADB under The Punjab Public Private Partnership Act 2019. The PPP Authority in Punjab is liable to function as an appraisal, oversight, and monitoring body. The authority has processed very few projects and did	Punjab has been an underperformer in terms of public-private partnerships. Their underperformance can be attributed to multiple factors. One of the factors is the unproductive PPP regime. The institutional responsibilities at various stages of project processing are not clearly defined.	Despite having a well-staffed PPP Authority, and PPP Cell, on account of having very few success stories, the PPP regime in Punjab remains relatively less developed. The

		not have political patronage due to which it is faced with various issues from time to time.	The existence of the PPP Authority, PPP Cell, and Risk Management Unit simultaneously makes the regime highly bureaucratic. Moreover, the function of identification, screening, and executing the project lies with the PPP Authority which limits the departmental ownership of the project. Lack of capacity and willingness in the line departments to execute PPPs is another major hurdle.	processes are not well defined in the statute. Moreover, the issues of willingness and capacity of departments have remained a major issue. Moreover, the political for PPP projects has remained conspicuous by its absence.
5.	Baluchistan	The regime was established in 2022 after the promulgation of the Baluchistan Public Private Partnership Act, 2021 (Act No. XXV of 2021). The province, with its limited resources, has done well to put together a PPP regime. The functions of a typical PPP unit are being discharged by the PPP Authority. The functions of the risk management unit are given to an entity in the Finance Department named as "PPP Unit".	The staff in the PPP Authority needs to be trained to manage end-to-end processing of PPP projects. Moreover, quality advisors need to be engaged in their transactions. Furthermore, engaging departments in the process is important to ensure that PPPs are integrated into the overall planning and development process.	The province has launched a few projects lately. The expeditious uptake of transactions can be ascribed to conducive guidelines for processing unsolicited proposals. However, the PPP Authority will take some time to develop human capital capable of running PPP projects.

Critical Evaluation of PSDP Plus Initiative

The PSDP Plus project (2020–2023) is a development program valued at PKR 5.2 trillion, designed to attract increased private sector funding, both domestically and internationally, to support Pakistan's socioeconomic development. The Ministry of Planning, Development, and Special Initiatives is implementing the project with assistance from the World Bank (Directors, 2020).

Key Statistics of PSDP Plus

The PSDP Plus projects will be implemented nationwide and are categorized into two main groups:

1. Projects with Zero Government Investment

- This category includes 29 projects across 11 sectors, expected to inject PKR 2.9 trillion of direct investment into the economy.
- These investments are projected to generate PKR 1.02 trillion annually in non-tax revenue and PKR 69 billion annually in tax revenue.

2. Projects with Limited Government Investment

- This group comprises 24 projects in seven sectors, supported by Viability Gap Funding (VGF).
- These projects are anticipated to bring in PKR 2.3 trillion in direct investment and approximately PKR 12 billion annually in tax revenue (Khan, 2019).

The key sectors targeted by the PSDP Plus initiative include aviation, industries and production, information and broadcasting, IT and telecommunication, maritime and shipping, communication, railways, the National Highway Authority (NHA), science, technology and innovation (ST&IT), and foreign affairs.

Table 3 PSDP + Highlights

	Projects with Zero Government Investment	Projects with Limited Government Investment
Total Direct Investment	PKR 3.1 trillion (6 times of PSDP)	PKR 2.4 trillion (4 times of PSDP)
Estimated Tax Revenue per annum	PKR 90 billion	PKR 12.4 billion
Estimated Non-tax Revenue per annum	PKR 1.1 trillion	N/A
Projects	29	24
Sectors	11	07

Issues/ Challenges in PSDP Plus

1. Faulty Governance Framework

The PPP governance framework has been inadequate, characterized by cumbersome prioritization and approval processes influenced by vested interests and resource misallocation. Confusion over approvals, procurement corruption, and the absence of clear checklists deter private investment. Weak accountability for missed deadlines and risks arising from corrupt anti-corruption institutions further hinder swift decision-making, discouraging effective project implementation and private-sector participation.

2. Irrational Sector Prioritization

Over 80% of PSDP Plus projects are infrastructure-focused, disproportionately benefiting certain social groups. Approximately 40% of these projects' budgets are compromised through commissions, kickbacks, and the use of substandard materials. Project evaluations emphasize short-term inputs or spending rather than long-term growth or outcomes.

3. Political Instability

Political unrest in Pakistan disrupts the stable business environment necessary for private investment. It causes delays in project approvals and execution, hindering coordination among stakeholders and government ministries.

4. Security Concerns

Investor and investment security in Pakistan is weak due to inefficient arbitration and dispute resolution, complex tax systems and laws, and widespread issues such as theft, robbery, kidnapping, extortion, and bribery.

5. Global Economic Meltdown

The COVID-19 pandemic disrupted supply chains, contracted the global economy, and negatively impacted Pakistan's imports, exports, and remittances. This economic downturn reduced funding and implementation capacity for the PSDP Plus program.

6. Lack of Collaboration Between Stakeholders

Effective coordination among stakeholders is crucial for the PSDP Plus program's success. Poor coordination in Pakistan leads to duplication, delays, and disputes, risking resource wastage and undermining desired outcomes.

7. Climate Change and Natural Disasters

Pakistan's vulnerability to natural disasters and climate change poses significant risks to infrastructure and economic activity. The PSDP Plus program must incorporate safeguards to mitigate these risks and prevent setbacks or delays.

Comparative Analysis of Initiatives of PPP with Best Practices

Comparing the initiatives taken to promote Public-Private Partnerships (PPPs) in Pakistan, India, and the USA provides valuable insights into their respective approaches, challenges, and successes. Each country has adopted distinct strategies to leverage PPPs for infrastructure development and economic growth, tailored to local needs and regulatory environments. Here's a comparative analysis highlighting lessons learned and best practices to inform future policy and implementation efforts.

Policy Framework

Pakistan:

Pakistan has actively promoted PPPs through various policy frameworks, including the establishment of the Public-Private Partnership Authority (PPPA) and the enactment of legislation like the PPP Act of 2017. These efforts aim to provide a robust legal and regulatory framework to facilitate PPP projects.

India:

India has promoted PPPs through initiatives such as the creation of the PPP Appraisal Committee, the Model Concession Agreement framework, and the establishment of the India Infrastructure Finance Company Limited (IIFCL) to provide financial assistance for infrastructure projects.

USA:

In the USA, PPP promotion varies at the state level. While some states have robust frameworks for PPP projects, others face challenges. The Federal government supports PPPs through initiatives like the Transportation Infrastructure Finance and Innovation Act (TIFIA) and the Private Activity Bonds (PABs) program, which provide financial assistance for infrastructure projects.

Sectoral Focus

Pakistan:

Pakistan primarily focuses on infrastructure sectors such as transportation, energy, and water management. Notable projects include the Lahore Metro Bus System and various energy ventures under PPP arrangements.

India:

India's PPP initiatives span multiple sectors, including transportation, healthcare, education, and renewable energy. Projects like the Delhi Airport Metro Express and the National Highways Development Project illustrate India's diverse PPP portfolio.

USA:

In the USA, PPPs are prominent in transportation infrastructure, including

highways, bridges, and airports. Some states have also leveraged PPPs in healthcare, education, and water infrastructure.

Challenges

Pakistan:

Challenges in Pakistan include bureaucratic hurdles, political instability, and legal issues that hinder smooth PPP implementation. Transparency and corruption concerns also pose significant obstacles.

India:

India's PPP landscape faces challenges related to land acquisition, regulatory clearances, and financing. Delays in project approvals and renegotiation of contracts are common issues.

USA:

The USA encounters challenges such as funding constraints, political opposition, and public skepticism about privatization. Additionally, navigating complex regulatory environments and managing risks associated with long-term projects remain ongoing difficulties.

Successes

Pakistan:

Despite challenges, Pakistan has implemented successful PPP projects, particularly in transportation and energy sectors. The Karachi-Lahore Motorway and the Hub Power Plant are notable examples.

India:

India has achieved success with projects such as the Mumbai-Pune Expressway and the Delhi Metro. These successes are attributed to innovative financing mechanisms and strong public-private collaboration.

USA:

Successful PPP projects in the USA include the Denver International Airport and the Port of Miami Tunnel. These projects demonstrate the efficiency of PPPs in delivering infrastructure and leveraging private sector expertise.

In summary while Pakistan, India, and the USA have made efforts to promote Public-Private Partnerships (PPPs), each country faces unique challenges and has achieved varying levels of focus and success. Pakistan emphasizes energy and infrastructure development, India concentrates on transportation and urban development, and the USA applies PPPs across diverse sectors, including healthcare and education. By learning from one another, these countries can refine their PPP frameworks, improve regulatory and operational efficiencies, and ensure the successful implementation of future projects. This collaborative approach can drive sustainable economic growth and improve public services globally.

SWOT Analysis of the PPP Sector in Pakistan

Strengths

1. **Policy Support:** The government has established frameworks and policies to encourage PPP projects, such as the Public-Private Partnership Authority (P3A).
2. **Economic Diversification:** PPPs help diversify the economy by involving private sector investment in infrastructure, energy, and other essential sectors.
3. **Risk Sharing:** PPPs allow for risk-sharing between the public and private sectors, reducing the financial burden on the government.
4. **Improved Efficiency:** Private sector involvement can lead to increased efficiency, innovation, and higher quality in project execution and management.

Weaknesses

1. **Regulatory Challenges:** Inconsistent regulatory environments and bureaucratic red tape can hinder the smooth execution of PPP projects.
2. **Funding Constraints:** Limited access to long-term financing and higher borrowing costs can be significant obstacles to PPP initiatives.
3. **Political Instability:** Political instability and frequent changes in government policies can negatively impact the long-term viability of PPP projects.
4. **Capacity Issues:** Both the public and private sectors may lack the necessary technical and managerial capacities to effectively implement and manage PPP projects.

Opportunities

1. **Infrastructure Development:** Significant opportunities exist in sectors like transportation, energy, and urban development, which require substantial investment and modernization.
2. **Foreign Investment:** Attracting foreign direct investment (FDI) through PPPs can boost economic growth and bring in advanced technologies and expertise.
3. **Economic Growth:** With an improving economic outlook, there is potential for increased private sector participation in PPP projects.
4. **Social Development:** PPPs can play a crucial role in enhancing public services, such as healthcare, education, and water supply, thereby improving the quality of life for citizens.

Threats

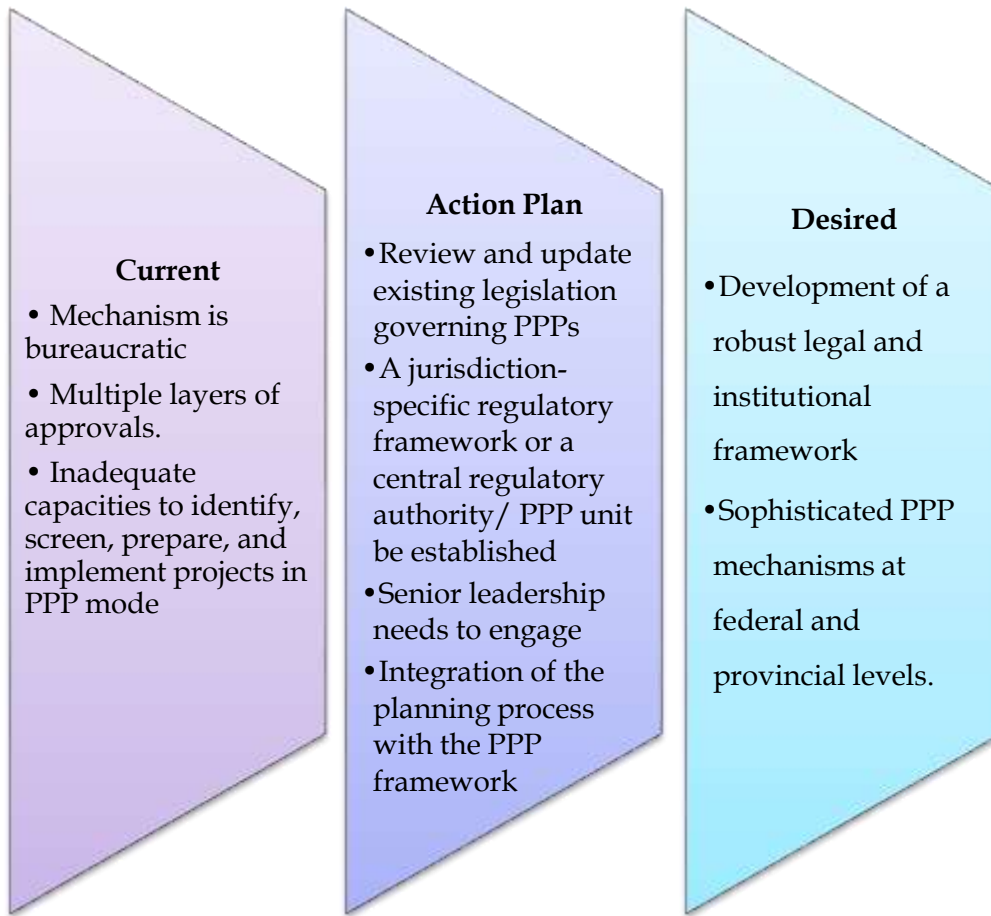
1. **Economic Uncertainty:** Macroeconomic instability, such as inflation and currency fluctuations, can pose risks to the financial viability of PPP projects.
2. **Corruption:** Corruption and lack of transparency in the procurement and execution of PPP projects can lead to inefficiencies and a loss of public

- trust.
3. **Public Opposition:** Resistance from local communities or public opposition to certain projects can cause delays or cancellations.
 4. **Legal and Contractual Issues:** Disputes arising from unclear contractual terms, inadequate legal frameworks, or changes in laws can lead to project delays and increased costs.

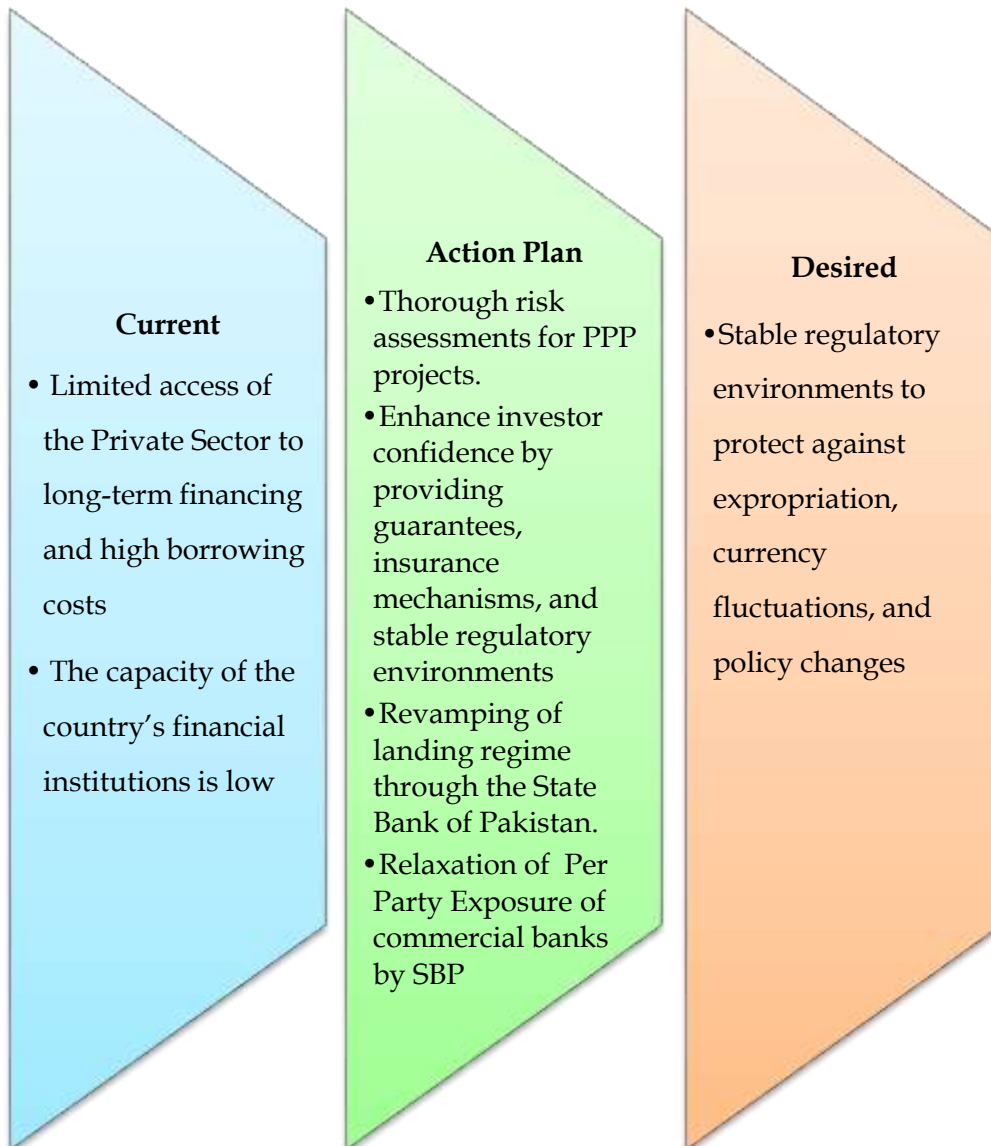
PESTEL Analysis for the PPP Sector in Pakistan

P	E	S	T	E	L
Political	Economic	Social	Technological	Environmental	Legal
<ul style="list-style-type: none"> • Stability and transparency of government policies • Political will and commitment to promote PPP initiatives. • Regulatory frameworks governing PPP projects and their effectiveness. 	<ul style="list-style-type: none"> • Economic stability and growth prospects impacting investment attractiveness. • Availability of funding and financing options for PPP projects. • Exchange rate fluctuations and their impact on project costs and revenues. 	<ul style="list-style-type: none"> • Socio-cultural acceptance of PPP projects within local communities • Labor market dynamics and availability of skilled workforce • Social impact assessments and considerations in planning and execution 	<ul style="list-style-type: none"> • Adoption of modern technologies and digitalization in infrastructure development • Technological capabilities and readiness of local industries for PPP projects. • Integration of innovative solutions for optimizing project efficiency and performance. 	<ul style="list-style-type: none"> • Environmental regulations and compliance requirements for PPP projects • Impact of climate change and natural disasters on infrastructure resilience • Implementation of sustainable practices and green initiatives in PPP projects. 	<ul style="list-style-type: none"> • Legal frameworks governing PPP contracts, concessions, and risk allocation. • Transparency and efficiency of legal processes related to PPP project approvals. • Resolution mechanisms for disputes and conflicts arising in PPP partnerships. • Policy framework available

GAP Analysis for PPP in Pakistan Regulatory & Capacity Issues



Financial Constraints



ANALYSIS OF ISSUES & CHALLENGES

- **Regulatory Hurdles:** The PPP mechanism across Pakistan is highly bureaucratic, involving multiple layers of approvals, making project processing extremely challenging.
- **Capacity Issues:** Both public and private sectors often face constraints in project management and technical expertise. Additionally, government departments lack adequate capacity to identify, screen, prepare, and implement projects under the PPP model.

- **Human Resource Challenges:** Staffing in PPP units remains a significant impediment. The staff often lacks sufficient training and commercial acumen. High employee turnover, particularly in the Sindh PPP Unit, further exacerbates the problem.
- **Deficiency of Professional Technical Experts:** The government has not engaged renowned consultants for transactions, resulting in suboptimal structuring of undertaken projects.
- **Cumbersome Procedures:** The processes from project inception to approval are excessively lengthy, typically taking 9–10 months for project approval under the PPP regime. Additionally, contract awarding involves another time-consuming procedure.
- **Lack of Capacity at Unit or Node Level:** Many departments lack established PPP Nodes and professionals capable of leading PPP transactions. Meetings are often attended by lower-tier managers, leaving high-level decisions inadequately addressed.
- **Unconducive PPP Regime:** Institutional responsibilities at various stages of project processing are not clearly defined. For instance, in Punjab, the simultaneous existence of the PPP Authority, PPP Cell, and Risk Management Unit creates excessive bureaucracy. Similarly, Khyber Pakhtunkhwa's three-tier approval mechanism adds unnecessary hurdles to project approvals.
- **Poor Node Structure:** PPP Nodes at the departmental level are poorly organized and lack the capacity to conceive, screen, prepare, deliver, and manage PPP projects. The absence of commercial acumen for structuring transactions is a critical issue.
- **Financial Constraints:** The private sector faces limited access to long-term financing and high borrowing costs. Furthermore, the capacity of financial institutions in the country is low, with limited appetite for investing in PPP projects.
- **High-Risk Perception Among Private Sector Investors:** Interest rate fluctuations and high debt ratios deter private sector investment. Additionally, political instability, security concerns, and a lack of ease in doing business discourage private sector participation.
- **Inadequate Transparency and Accountability Mechanisms:** Transparency and accountability mechanisms are insufficient. The public sector is plagued by corruption and governance issues.

Regional Best Practices

Singapore: A PPP Success Story

Singapore is one of the world's largest trading hubs. It consistently ranks as one of the most competitive economies globally and has made significant efforts to streamline its trade processes. TradeXchange®—a neutral platform facilitating interconnectivity between the private sector and regulatory systems—was established to enhance the seamless exchange of data. Private sector Value-Added Service providers were integrated into the platform to

enrich the ecosystem.

The government provided an up-front fee for the development of TradeXchange® and an annual fixed recurring fee for its maintenance. The PPP partner, in contrast, covered the full development, operation, and maintenance costs. Ownership of the system remained with the government, while the PPP partner was contracted to build and operate it for 10 years. To ensure cost recovery and a sustainable operating model, the PPP partner collected usage fees for the system, distinct from duties and taxes, which were paid directly to the government. Currently, TradeNet® can process over 90% of submitted declarations within 10 minutes (Organizations, 2023).

Conclusion

Public-private partnerships (PPPs) hold significant potential for accelerating industrial development in Pakistan by leveraging private sector expertise, improving infrastructure, and attracting investments. Despite challenges, ongoing projects demonstrate the positive contributions of PPPs to various industrial sectors, fostering economic growth, job creation, and technological advancement. Enhanced regulatory frameworks, innovative financial mechanisms, and robust capacity building are essential to maximize the benefits of PPPs, ensuring sustainable and inclusive industrial development in Pakistan.

Recommendations

Improving the PPP framework in Pakistan requires a multifaceted approach encompassing legal and regulatory reforms, institutional capacity building, stakeholder engagement, and risk mitigation strategies. Below are recommendations to enhance the PPP framework:

Clarify Legal and Regulatory Frameworks

- Review and update existing legislation governing PPPs to address ambiguities, streamline processes, and provide clarity on roles, responsibilities, and dispute resolution mechanisms.
- Establish a jurisdiction-specific regulatory framework or a central regulatory authority/PPP unit with the mandate to oversee PPP projects and ensure compliance with best practices.
- Engage senior leadership to emphasize the significance of PPPs and secure political ownership of projects.
- Integrate planning processes with the PPP framework to create a more robust approach to planning and development.

Enhance Institutional Capacity

- Invest in training programs and capacity-building initiatives for government officials involved in PPP project identification, appraisal, procurement, and monitoring.
- Foster collaboration between government agencies, private sector entities, academia, and international partners to leverage expertise, share best practices, and build a knowledge base for PPP implementation.
- Engage high-quality advisors to structure transactions effectively and enhance skill development.
- Revise HR policies to improve contract renewal processes, performance management, and talent retention, reducing employee turnover and enabling continuous resource engagement.

Enhance Development Through Strategic Public Funding

- Revive programs like PSDP Plus to minimize public fund usage and encourage private-sector investment.
- Utilize forums like the Special Investment Facilitation Council (SIFC) to promote private sector involvement in infrastructure projects.

Mitigate Financial and Political Risks

- Conduct thorough risk assessments for PPP projects, including financial, political, regulatory, and operational risks, and develop mitigation strategies.
- Enhance investor confidence through guarantees, insurance mechanisms, and stable regulatory environments to address risks such as expropriation, currency fluctuations, and policy changes.
- Revamp the lending regime through the State Bank of Pakistan to encourage private-sector confidence by relaxing legal lending limits and offering more loans for PPP projects.
- Introduce special financial products, such as hedging contracts, to mitigate risk for private investors.

Improve Financial Viability

- Provide Viability Gap Funding (VGF) to economically justified but financially unviable PPP projects, making them attractive to private investors.
- Develop local capital markets and introduce long-term financing instruments to ensure sustainable funding sources.

Promote International Collaboration

- Collaborate with international organizations and countries with successful PPP models to adapt best practices to Pakistan's context.
- Create favorable conditions for foreign investors through tax incentives, streamlined processes, and protection against political and financial risks.

Encourage Innovation and Technology Adoption

- Embrace innovative financing mechanisms, such as green bonds, Islamic finance, and public venture capital funds, to attract diverse investment sources.
- Leverage digital technologies, data analytics, and artificial intelligence to optimize project planning, design, construction, and operation, enhancing efficiency and reducing costs.

Promote Public Engagement and Stakeholder Consultation

- Engage local communities, civil society organizations, and other stakeholders to align projects with social and environmental priorities.
- Establish public-private dialogue mechanisms to facilitate collaboration, resolve conflicts, and build consensus on project objectives and strategies.

Sector-Specific Strategies

- Focus on infrastructure sectors such as transportation, energy, and water management, where PPPs can significantly improve service delivery and efficiency.
- Promote PPPs in healthcare and education to enhance access and quality, leveraging private sector expertise and investment.

Ensure Sustainability and Social Inclusion

- Integrate environmental protection, climate resilience, and social inclusion principles into PPP project design and implementation.
- Prioritize projects addressing critical societal needs, such as healthcare, education, and water supply, to promote inclusive and equitable development.

Improve Transparency and Accountability

- Strengthen procurement processes to ensure transparency, fairness, and competitiveness in selecting private partners.
- Establish "Ease of Doing Business" centers at federal and provincial investment supervisory authorities to streamline permits and approvals.
- Implement digital platforms providing real-time data on PPP projects, including bidding processes, contract awards, project progress, and financials, to build public trust.
- Conduct independent audits and evaluations regularly to ensure accountability and performance monitoring.
- Develop feedback mechanisms to gather stakeholder insights, including beneficiaries, for continuous improvement.

Log Framework Matrix

Goal I: Improved Capacity for effective PPP implementation in Pakistan

Activities / Actions	KPIs	Means of Verification	Cost & Source of Funding	Executing Agency	Time-frame
Enhanced understanding and skills of PPP stakeholders	<ul style="list-style-type: none"> Increase in the number of successful PPP projects implemented in Pakistan Percentage increase in the number of PPP professionals trained 	Records from the Pakistan PPP Authority / Provincial PPP Units	PSDP Donor Funding	Pakistan PPP Authority / Provincial PPP Units	28 days
Developed training programs and materials	<ul style="list-style-type: none"> Number of training modules developed and disseminated Number of trained PPP experts hired Number of people trained 	<ul style="list-style-type: none"> Training materials, distribution records, Evaluation reports, participant feedback forms 	PSDP Donor Funding	Pakistan PPP Authority / Provincial PPP Units	45 days

Goal II: To Establish a Jurisdiction-Specific Regulatory Framework

Activities/ Actions	KPIs	Means of Verification	Cost & Source of Funding	Executing Agency	Timeframe
Establish a sustainable Public-Private Partnerships (PPPs) regime in Pakistan	<ul style="list-style-type: none"> Approval of concept note Approval from Cabinet Establishment of PPP regulatory authority with a defined structure and functions. 	<ul style="list-style-type: none"> Copies of approved policy documents, organizational structure charts Annual reports from the PPP Regulatory Authority 	PSDP Donor Funding	Pakistan PPP Authority/ Provincial PPP Units	90 days

Goal III: Efficient Use of Financial Resources and Increased Private-Sector Investment in Large-Scale Public-Sector Projects

Activities/ Actions	KPIs	Means of Verification	Cost & Source of Funding	Executing Agency	Timeframe
Revival of the PSDP Plus program	number of new projects included induced investment figures	PSDP+ document Copies of approved policy documents	No funding	Pakistan PPP Authority / Provincial PPP Units	90 days

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Creating Conducive Environment for IT, Business, and Industrial Start-ups

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KJPP

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Abstract:

Governance plays a vital role in formulating climate change policies, especially in countries vulnerable to environmental hazards like Pakistan. Good governance requires a synergy between capable governments, civil society, and the private sector to create policies that improve disaster resilience and climate adaptation. Pakistan, although contributing less than 1% to global greenhouse gas emissions, ranks among the top 10 most affected countries by climate change. The recurrent climate-related disasters, such as the 2022 floods, demonstrate the urgent need for effective governance to mitigate climate risks. While Pakistan has aligned its national policies with international climate frameworks, challenges remain in policy implementation due to institutional, financial, and technical barriers. Strengthening governance, increasing domestic climate finance, and adopting innovative technologies are critical steps toward achieving resilience. Effective climate action requires a coordinated effort among all stakeholders to enhance Pakistan's capacity for climate adaptation and disaster preparedness.

Key words:

Governance, climate change Policies, Disaster Resilience, Climate Adaptation, Pakistan.

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Introduction

According to Forbes, start-ups are defined as newly established companies created to develop and market unique products or services, playing a pivotal role in driving innovation and economic development. These companies are often funded through various stages, starting with bootstrapping from founders, friends, and family, followed by seed funding from angel investors, and later rounds of funding (Series A, B, C, and D) led by venture capital firms. Eventually, some start-ups may go public through an Initial Public Offering (IPO) or be acquired by larger companies, providing an exit strategy for early investors (Baldrige, 2022).

Start-ups are critical to the economic development of any country, especially developing economies. They generate numerous employment opportunities, contributing significantly to GDP growth. For instance, according to a study by the Kauffman Foundation, start-ups in the United States create approximately 1.5 million jobs annually (Centre, 2023). Start-ups also drive economic activity, enhance a country's competitiveness, and foster regional development by addressing unmet needs and creating new markets. The role of technology in the success of start-ups cannot be overstated. IT facilitates product development, reduces costs through scalable solutions like cloud computing, enhances productivity, and improves customer service, enabling start-ups to reach broader markets efficiently (24x7direct, 2024).

Globally, countries have adopted various best practices to support start-ups. For example, Silicon Valley in the USA benefits from a robust legal framework, substantial funding, top-tier universities, and a culture of innovation (Iconsultant & Little, 2023). India has seen significant growth in its start-up ecosystem due to government initiatives like Start-up India, the SAMRIDH Scheme, and Make in India initiatives. With a large pool of affordable skilled labor, coupled with a vast domestic market and a conducive business environment, India has become a global powerhouse with more than 112,718 start-ups recognized by DPIIT (Department for Promotion of Industry and Internal Trade). As of January 2024, India had 111 unicorn start-ups (unicorn: a privately held start-up company valued at over \$1 billion), with a total valuation of more than \$350 billion (Ujjain, 2024). Additionally, Sweden and China provide strong innovation funding, collaborative spaces, and a supportive regulatory environment, contributing to their thriving start-up ecosystems (Iconsultant & Little, 2023).

In Pakistan, the start-up ecosystem has evolved significantly over the past two decades. One of the earliest successful start-ups, Rozee.pk, was founded by Monis Rahman in 2007 and became Pakistan's first venture capital-funded start-up (Niazi, 2023). The ecosystem has since grown, with notable start-ups like SimSim, Airlift, Bykea, Dukan, and Easypaisa, among others.

The establishment of the first incubator at NUST in 2005, followed by others at institutions like LUMS and IBA, laid the groundwork for a supportive environment for start-ups. The National Incubation Centers (NICs), launched in 2016, have further transformed the landscape, providing vital support to early-stage start-ups (Abbasi, 2019). Despite several challenges, Pakistani start-ups have attracted significant funding and investments in recent years. In 2020, the ecosystem received total investments of USD 70 million, with Bykea leading at USD 13 million. In 2021, investments soared more than five times, totaling USD 373 million. Despite the global recession in 2022, Pakistani start-ups raised USD 360 million (Iconconsultant & Little, 2023). However, in 2023, investments drastically fell by 77.2% to a meager USD 75.6 million, due to, among other factors, high interest rates and a global tightening environment (Hussain, 2024).

Pakistan's regulatory framework for start-ups is complex and involves multiple regulatory bodies, including the Securities and Exchange Commission of Pakistan (SECP), the State Bank of Pakistan (SBP), and the Competition Commission of Pakistan (CCP), among others. The lack of a centralized regulatory authority results in fragmented oversight, increased compliance costs, and challenges for start-ups (Iconconsultant & Little, 2023). However, the government has introduced several initiatives to support start-ups, such as the Pakistan Start-up Fund (MoITT, 2024), BridgeStart Pakistan (Ignite, 2024), and the establishment of Special Technology Zones, which provide infrastructure, resources, and incentives for innovation and entrepreneurship (Akhtar, 2023).

An understanding of the start-up ecosystem would be incomplete without mentioning Entrepreneurship Support Organizations (ESOs), which mainly include incubators and accelerators (Iconconsultant & Little, 2023). These organizations play a crucial role in nurturing start-ups by providing, among other things, resources, mentorship, and networking opportunities. In Pakistan, there are 83 such entities, including eight NICs, Durshal, Takhleeq, NSPIRE, WomenX, and Invest2Innovate (i2i), as well as a number of incubators operated by universities like LUMS, IBA, NUST, and NUML, which support start-ups across various sectors. As per Ignite's 2023 report, NICs have collectively incubated 1,317 start-ups, of which 660 have successfully graduated (Iconconsultant & Little, 2023). Further, NICs have become key supporters of female entrepreneurship, with almost one-third of their start-ups (491) led by women, representing 37% of all NIC-supported ventures.

Category	Total
Incubators	22
Accelerators	13
Co-Working spaces	18
University-based incubators	30
Total	83

Table 1: ESOs in Pakistan’s Start-up Ecosystem (Iconsultant & Little, 2023)

In Pakistan, the fintech sector has seen notable growth, with platforms like JazzCash and Easypaisa promoting digital payments and financial inclusion. The e-commerce industry has also expanded, driven by platforms like Daraz, especially during the COVID-19 pandemic. Healthtech start-ups, such as oladoc.com and Marham, are improving access to medical services. The edtech sector, with platforms like SABAQ and Knowledge Platform, has gained traction, particularly during the pandemic. Agritech start-ups, like Ricult, are enhancing farming practices and promoting sustainable agriculture (URCA, 2024). However, Pakistan does not yet have a unicorn, unlike India, which had 111 unicorns as of January 2024 (Ujjain, 2024).

According to the Global Start-up Ecosystem Index Report 2023 by Genome, Pakistan is absent from the top 40 start-up hubs worldwide, while India’s Bengaluru-Karnataka ranks 20th and Delhi stands at 24th position (Genome, 2023). Furthermore, according to Arthur D. Little’s Archetype model for assessing the degree of digitization of an economy, which contains seven stages, Pakistan is at the second level, as an ICT patron. Countries within this archetype are characterized by their extensive use of ICT goods and services, although they have a minimal role in the global ICT value chain (Iconsultant & Little, 2023).



Figure 1: Arthur D. Little’s Digitization Archetype Model

Despite significant efforts, Pakistan's start-up ecosystem faces challenges such as limited access to local venture capital, economic and political instability, and an over-reliance on international investors. Additionally, there are gaps in the educational system, insufficient training programs for entrepreneurs and start-up founders, and inconsistent internet connectivity, particularly in rural areas. Addressing these challenges through regulatory reforms, enhanced funding mechanisms, improved infrastructure, and targeted support programs is essential for the sustained growth and impact of the start-up ecosystem in Pakistan. By leveraging existing initiatives and

addressing these issues, Pakistan can cultivate a thriving start-up ecosystem that significantly contributes to economic growth and technological advancement. The following figure shows the major start-ups in Pakistan's start-up ecosystem as of 2023.



Figure 2: Major start-ups in Pakistan's start-up ecosystem (Darbar & Capital, 2023)

Statement of the Problem

"The start-up ecosystem in Pakistan is currently in its nascent stage, but it holds great potential for inclusive economic growth due to the large youth population and the government's supportive role, among other factors. In contrast, Pakistan is lagging far behind most global players like Singapore, China, and India, as evidenced by several international benchmarks. Therefore, there is an urgent need to examine the factors responsible for the overall performance of Pakistan's start-up ecosystem, such as the regulatory framework, access to finance, support structures, and skills alignment with industry needs, in order to identify the challenges and determine the way forward."

Literature Review

Start-ups are critical drivers of economic development, fostering innovation, creating jobs, and stimulating economic activity, thereby making a significant contribution to GDP growth (I2I, 2021). Technology plays a crucial role in their success, enabling rapid scaling and global reach through advanced tools like AI, IoT, and blockchain (PSEB, 2020). Pakistan's start-up ecosystem has evolved notably, with increased support from the Higher Education Commission (HEC) and the establishment of Business Incubation Centers (BICs) and Offices of Research, Innovation, and Commercialization (ORICs), though these initiatives face challenges related to coordination and quality (Iconstant & Little, 2023). The ecosystem's potential is reflected in the \$350 million raised by Pakistani start-ups in 2021, marking a 438% increase from the previous year, driven by a young, tech-savvy population and growing international investor confidence (I2I, 2021). However, the complex

regulatory environment, multiple agency involvement, and skill gaps in education present significant hurdles (Icon consultant & Little, 2023). Addressing these issues through enhanced support programs and better alignment between education and industry needs is crucial for sustaining momentum and fostering a conducive environment for start-ups.

ANALYSIS OF PAKISTAN'S START-UP ECOSYSTEM

1. Situational Analysis

i. Analysis of the Potential of Pakistan's Start-up Ecosystem

The Pakistani start-up ecosystem has shown substantial potential and strength in recent years. According to the Global Start-up Ecosystem Index 2024 by Start-upBlink, Pakistan ranks 71st worldwide and 2nd in South Asia (StartupBlink, 2024). In 2021, Pakistani start-ups raised a record \$373 million, more than five times the amount raised in 2020, indicating growing investor confidence. The presence of international investors such as Tiger Global and Kleiner Perkins signifies Pakistan's rising prominence in the global start-up landscape (Icon consultant & Little, 2023). With nearly 64% of the population under 30, Pakistan boasts a large pool of young, tech-savvy individuals driving innovation. According to the Pakistan Economic Survey 2022-23 (Finance, 2023), Kearney's Global Services Location Index (2021) ranked Pakistan as the second most financially attractive location in the world for offshore outsourcing in IT and ITeS. The International Labour Organization (ILO) also reported Pakistan as the second-largest supplier of digital labor services in its 2021 report, highlighting the IT skills and potential of the Pakistani workforce.

Furthermore, there are 136 million broadband subscribers (both mobile and fixed-line), resulting in a broadband penetration rate of 56.37% (PTA, 2024). This digital transformation facilitates the growth of tech-based start-ups and expands their potential market.

Government initiatives and support programs, such as the Pakistan Start-up Fund (MoITT, 2024), BridgeStart Pakistan (Ignite, 2024), and Pakistan's largest free online training program, Digiskills.pk (Digiskills, 2024), as well as the HEC's Business Incubation Center Policy 2021 to foster entrepreneurial talent in universities (Icon consultant & Little, 2023), provide a supportive environment for start-ups. The establishment of Special Technology Zones aims to attract foreign investment through incentives like tax breaks. Additionally, the Government of Pakistan introduced the definition of a start-up into the Income Tax Ordinance, 2001, through the Finance Act of 2017, to promote innovation and entrepreneurship, particularly in IT. Before this, there were no specific tax exemptions for start-ups. The expansion of Entrepreneur Support Organizations (ESOs),

including 83 incubators, accelerators, and co-working spaces, offers crucial support to start-ups. Diverse sectors such as fintech, e-commerce, healthtech, edtech, and agritech are witnessing significant growth, with notable start-ups like Airlift and Bazaar achieving major milestones (IZI, 2021). Recent success stories such as Bykea, Farmdar, Pakvitae, BizB, MyTM, Digikhata, and Ezbike further reflect the potential for growth in Pakistan's start-up ecosystem (Iconconsultant & Little, 2023).

A survey conducted by our research team, through a questionnaire circulated among different stakeholders (Annex-I), highlighted the following strengths and potential of Pakistan's start-up ecosystem, among others:

- High risk appetite among youth
- Resilience in adverse conditions
- Cultural shift towards entrepreneurship
- Increasing female participation
- Strong community and peer support
- Social media influence and reach

ii. Analysis of the Current Status of Pakistan's Start-up Ecosystem

The Pakistani start-up ecosystem has experienced reasonable growth in recent years, marked by an increase in the number of new start-ups and a rise in investments (up until 2022). In 2020, Pakistani start-ups raised \$70 million, which soared to \$373 million in 2021 and \$360 million in 2022, despite global economic challenges (Iconconsultant & Little, 2023). However, in 2023, the investment dropped drastically to a meager \$75.6 million due to various internal and external factors (Hussain, 2024).

Additionally, there is a significant gender gap in Pakistan's start-up ecosystem. Out of the \$277 million raised by Pakistani start-ups in early 2022, only \$1.8 million was raised by a female entrepreneur (Iconconsultant & Little, 2023). There is also a lack of cooperation and coordination among various stakeholders within the ecosystem, along with a deficiency of reliable data. For instance, while the Higher Education Commission (HEC) promoted the establishment of Business Incubation Centers (BICs) and Offices of Research, Innovation, and Commercialization (ORICs), these programs have faced challenges related to quality and insufficient communication and coordination among universities. Support entities such as incubators, accelerators, and co-working spaces have often operated in silos. Furthermore, there has been a significant deficiency in industry-level data collection and storage, resulting in the absence of data-driven growth strategies (Iconconsultant & Little, 2023).

At present, Pakistan does not have a single unicorn, while India has 111 unicorns as of January 2024 (Ujjain, 2024). Another issue is the insufficient digital literacy in Pakistan, which is just over 34% (Mehdi, 2023), posing a significant impediment to the growth of a tech-driven start-up ecosystem. Additionally, according to PTA, around 44% of the population lacks internet access (PTA, 2024), particularly in remote and underdeveloped areas, contributing to a widening digital divide and hampering digital inclusivity.

A survey conducted by our research team (Annex-I) highlighted the following challenges in Pakistan's start-up ecosystem, among others:

- Skepticism towards digital payments
- Brain drain to more developed markets
- Slow adaptation to new technologies
- Bureaucratic hurdles
- High dependency on traditional business models

iii. Contribution of Start-ups to the Economic Development of Pakistan

Start-ups are critical to Pakistan's economic development, driving innovation, creating employment opportunities, and contributing to GDP growth. According to Ignite's report, the National Incubation Centers (NICs) have performed commendably well against the amount invested by Ignite, generating a total of PKR 13.85 billion versus PKR 22.10 billion invested. Since 2017, approximately PKR 3 billion has been spent on capital and operational expenditures for the first five NICs. The overall impact, considering cumulative revenue and investments, has amounted to around PKR 35.95 billion, yielding a financial return approximately 12 times the initial investment of PKR 3 billion.

Furthermore, more than 126,000 jobs have been created through NICs-supported start-ups, and around 500 female founders and entrepreneurs have been supported. The following figure briefly highlights the contribution of NICs to the Pakistani economy:

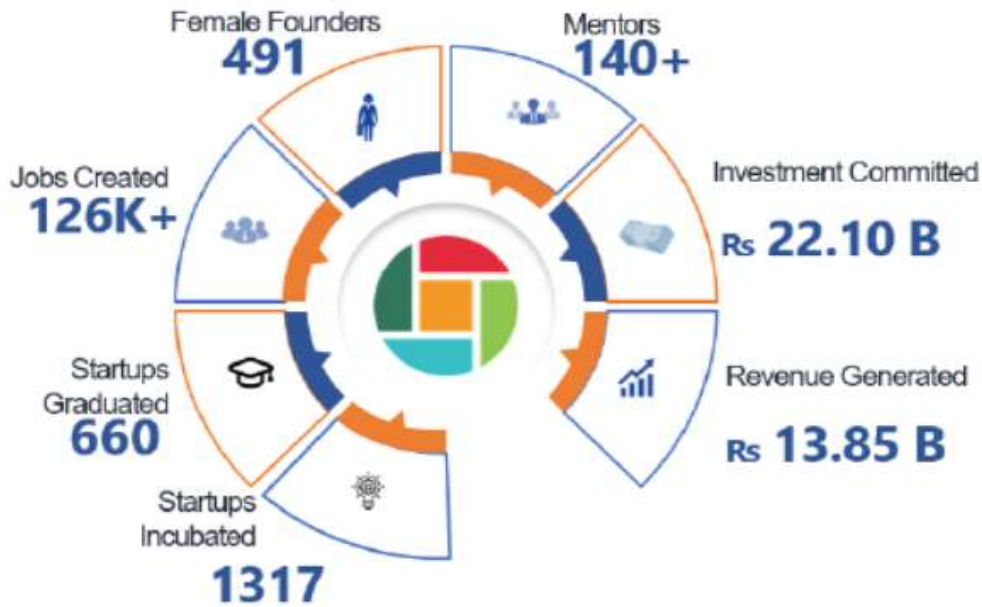
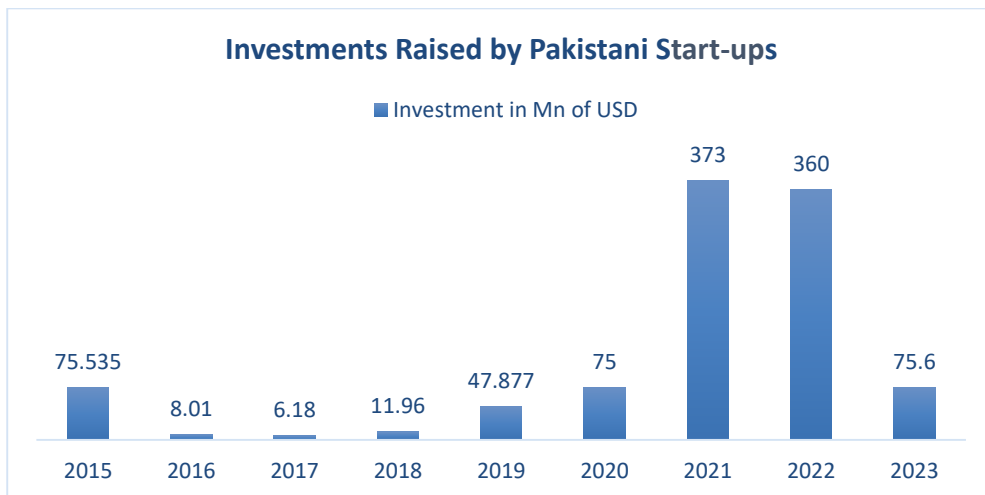


Figure 2: Achievements of NICs (Iconconsultant & Little, 2023)

In an interview conducted by Al Jazeera, Mr. Faisal Aftab, CEO of Zayn Capital (a venture capital fund), estimated that Pakistani start-ups will be worth USD 50 billion by 2030. According to him, the current valuation of Pakistan's start-up ecosystem is estimated at \$1.8 billion. Including companies like Daraz and Foodpanda, this valuation increases to between \$3 billion and \$4 billion. Daraz, an e-commerce platform founded in Pakistan, now operates in multiple countries, while Foodpanda is an international food and grocery delivery service (Chughtai & Ali, 2022). Moreover, there has been a continuous rise in investments attracted by Pakistani start-ups since 2017; however, the number dropped in 2023 due to several internal and external factors. The following chart shows the trend (Chughtai & Ali, 2022; Iconconsultant & Little, 2023; Hussain, 2024):



2. Analysis of Existing Legal & Institutional Frameworks

i. Current Legal and Institutional Framework

Currently, Pakistan lacks an independent regulatory framework or a specific regulator for start-ups. Start-ups are subject to the same regulations as other business entities, with the applicable legal regime depending on their structure (e.g., sole proprietorship, partnership, LLC) and business activities. The absence of a single regulator means that different regulatory authorities may become involved based on the start-up's activities, transactions, and parties involved. Below is a list of relevant acts and regulators that govern start-ups in Pakistan (Iconsultant & Little, 2023):

a) Acts:

- Companies Act, 2017
- Central Depository Act, 2017
- Securities Act, 2015
- Foreign Exchange Regulation Act, 1947
- Electronic Transaction Ordinance, 2002
- Competition Act, 2010
- Prevention of Electronic Crimes Act, 2016

b) Regulators/Institutions:

- Securities and Exchange Commission of Pakistan (SECP)
- State Bank of Pakistan (SBP)
- Competition Commission of Pakistan (CCP)
- Intellectual Property Organization (IPO)
- Central Depository Company (CDC)
- Electronic Certification and Accreditation Council (ECAC)
- Punjab Information Technology Board (PITB)
- National Information Technology Board (NITB)
- Pakistan Software Export Board (PSEB)

ii. Current Taxation Regime for Start-ups

The Government of Pakistan introduced the definition of a start-up into the Income Tax Ordinance, 2001, through the Finance Act, 2017, to promote innovation and entrepreneurship, particularly in IT. Prior to this, there were no specific tax exemptions for start-ups. According to Section 2(62A) of the Ordinance, a start-up is defined as a business established by a resident individual, association of persons (AOP), or company that began on or after July 1, 2012, offering technology-driven products or services, certified by the Pakistan Software Export Board (PSEB), with a turnover of less than PKR 100 million in each of the last five tax years (Iconsultant & Little, 2023).

Notwithstanding the above, this tax exemption for start-ups is valid for only three years. After this period, if the start-up is registered with the Securities and Exchange Commission of Pakistan (SECP), it faces a high tax rate of 29% on profits (the small company rate for 2022 is 21%). This high tax burden can result in low net profits and returns, making it difficult for start-ups to absorb initial investments during this period.

Moreover, there is an inconsistency between federal and provincial sales taxes in Pakistan. Changes in tax rates and the need for multiple registrations at both the provincial and federal levels complicate business management for investors. Additionally, a 17% general sales tax on IT equipment (excluding laptops, which are taxed at 5%) raises the cost of services for both end users and start-ups, increasing operational expenses (Iconsultant & Little, 2023). Lastly, the cumbersome withholding tax regime, the lack of tax exemption for local investors in start-ups, and the absence of tax exemptions on salaries of individuals serving in start-ups are other issues that make the start-up ecosystem unattractive (Iconsultant & Little, 2023).

iii. "Exit" Framework

Unlike established companies, where financing focuses on growth for higher dividends or stock prices, start-up financing emphasizes "exits" by founders and investors for scaling the business, aiming for higher payouts upon exit. Therefore, all start-up transactions and financing instruments consider rights and liabilities at the time of exit. Legal policies on exits, such as Initial Public Offerings (IPOs) and Mergers and Acquisitions (M&As), significantly impact the start-up ecosystem and influence venture capital (VC) and angel investment decisions. The Global Start-up Ecosystem Report 2022 by Start-up Genome highlights that 7 of the top 15 start-up ecosystems were US cities, largely due to the JOBS Act, which created fundraising exemptions and relaxed exit options for start-ups. This act positively impacted the number of IPOs and increased start-up valuations in M&A transactions, as evidenced by various academic and research studies (Iconsultant & Little, 2023). A 2018 Ernst & Young report noted that start-ups accounted for 94% of IPOs in the first nine months, reflecting the JOBS Act's influence.

a) Exit through Initial Public Offering (IPO):

An Initial Public Offering (IPO) is the process by which a private corporation offers shares to the public, transitioning from a private to a publicly traded company. After an IPO, the company's shares are listed on a stock exchange and available for public trading. In Pakistan, the start-up ecosystem is still developing, and many start-ups need more time to mature before they can contemplate going public.

b) Exit through Mergers and Acquisitions (M&As):

The most popular exit strategy for investors in start-ups is acquisition or merger with another company, as IPOs are often not feasible for younger start-ups. Recent examples in Pakistan include Uber's acquisition of Careem, Zoodpay's acquisition of Tez Financial Services Limited, and GoZayaan's acquisition of Findmyadventure. The primary laws governing mergers and acquisitions (M&As) in Pakistan are the Companies Act and the Competition Act 2010 (Iconstant & Little, 2023).

c) Exit through Private Placement:

A popular alternative to IPOs is private placement, where securities are offered to a select group of investors rather than being listed on the stock exchange. According to Section 2 (xl) of the Securities Act, a private placement involves offering securities to a specific group of investors without using print or electronic media for invitations. This option is favored by venture capitalists and select investors, as it bypasses the extensive IPO process while still allowing for external investment. In Pakistan, under the Private Placement of Securities Rules 2017, all companies, except single-member companies, can issue securities through private placement, following the procedure outlined in Section 83 of the Companies Act.

According to Section 87 of the Securities Act, no one is allowed to publicly offer securities without meeting specific conditions. These conditions are detailed in Regulation 3 of the Public Offering Regulations 2017.

iv. IPO Regime

Intellectual Property Rights (IPRs) in Pakistan are governed by the Intellectual Property Organization (IPO) of Pakistan, established under the IPO Act, 2012. The IPO ensures the enforcement of IPRs with the help of enforcement agencies like the Federal Investigation Agency (FIA), Federal Board of Revenue (FBR), and local police. The IPO also creates awareness about IP rights and advises the Federal Government on implementing IP policies. The key types of intellectual property managed by the IPO include patents, layout designs of integrated circuits, industrial designs, copyrights, trademarks, and geographical indications. The primary legislation governing these areas includes the Patents Ordinance 2000, Copyright Ordinance 1962, and Trademarks Ordinance 2001, reflecting Pakistan's compliance with international treaties like the Paris Convention, Berne Convention, and TRIPS.

However, according to a survey (Annex-I), Mr. Pir Amad Ali Shah, the Project Director of Durshal Incubator, stated that "Start-ups in KPK struggle with inadequate IP laws, leading to fears of idea theft." The situation is largely similar in other parts of the country.

3. Comparative Analysis of Pakistan's Start-up Ecosystem with International Best Practices

i. Legal Framework

a) Pakistan

The legal framework for start-ups in Pakistan involves multiple regulatory bodies, such as the Securities and Exchange Commission of Pakistan (SECP), Federal Board of Revenue (FBR), and the State Bank of Pakistan, among others (StartupDotPK, 2022, September). The regulatory environment is complex, with high tax rates and bureaucratic delays due to the absence of a single regulatory authority. Furthermore, the tax exemption for start-ups is limited to just three years, after which high taxes on profits are imposed (Pakistan, 2023, July 30).

b) International Best Practices

Countries like the USA benefit from streamlined legal frameworks and policies such as the JOBS Act, which aims to reduce regulatory burdens on start-ups while facilitating their access to capital markets, maintaining necessary investor protections, and relaxing exit options for start-ups. This has significantly boosted IPOs and M&A transactions (JOBS Act, 2012). Start-ups in the USA employ 4% of the private workforce. Singapore provides a simplified regulatory environment with substantial government support through grants like the Enterprise Development Grant. India's *Startup India* initiative has reduced regulatory burdens and streamlined processes for start-ups (Karandaaz, 2024).

ii. ESOs (Incubators and Accelerators)

a) Pakistan

Pakistan has around 83 incubators and accelerators, including the National Incubation Centers (NICs), which provide essential support to start-ups. However, many incubators lack sufficient resources and consistent quality, limiting their effectiveness (Pakistan, 2023, July 30).

b) International Best Practices

In Silicon Valley, incubators like Y Combinator have been highly effective, housing 20% of all U.S. start-ups due to world-class mentorship, funding opportunities, and strong industry connections (Y Combinator, 2024). India's BIRAC SEED Fund supports biotech start-ups with specialized incubators and funding, enabling innovation and growth (Karandaaz, 2024).

iii. Access to Finance

a) Pakistan

Start-ups in Pakistan face limited access to local venture capital and economic instability. Government initiatives like the Pakistan Start-up Fund provide some support, but there remains a heavy reliance on international investors (Pakistan, 2023, July 30).

b) International Best Practices

Silicon Valley enjoys unparalleled access to venture capital, with substantial investments in start-ups. In China, high-tech start-ups benefit from policy initiatives and significant government funding, which amounted to \$53.7 billion in 2022. Singapore offers a range of financial incentives and funding programs for start-ups, including early-stage funding and tax incentives (Karandaaz, 2024).

iv. Skills and Capacity of Entrepreneurs & Start-up Founders

a) Pakistan

There is a significant gap between the skills provided by educational institutions and the needs of the start-up industry. Limited training programs and a lack of experienced mentors exacerbate this issue (Iconsultant & Little, 2023).

b) International Best Practices

The USA and India emphasize STEM education and entrepreneurship training, producing a skilled workforce. India's collaboration between government, academia, and the private sector has enhanced the skills of entrepreneurs through extensive training programs (Karandaaz, 2024).

v. Technology Adoption and Innovation

a) Pakistan

Start-ups in Pakistan face challenges such as inconsistent internet connectivity and limited access to advanced technologies. The pace of digital transformation is slower compared to other regions, which limits tech-driven innovation (Pakistan, 2023, July 30).

b) International Best Practices

Silicon Valley leads in the adoption of emerging technologies such as AI, IoT, and blockchain, with robust support from the ecosystem. The Chinese government heavily invests in high-tech sectors, promoting rapid adoption and integration of advanced technologies (Karandaaz, 2024).

vi. Market Access & Internationalization

a) Pakistan

The limited domestic market and regulatory hurdles restrict the growth potential of start-ups. Programs like BridgeStart aim to address these issues, but more comprehensive efforts are needed (Pakistan, 2023, July 30).

b) International Best Practices

Singapore's strategic location and excellent infrastructure make it a prime hub for international business. The USA's global networks and market size provide extensive opportunities for start-ups to scale internationally. India's *Startup India* initiative also supports international market access through various programs (Karandaaz, 2024).

vii. Government Incentives including Tax Exemptions

a) Pakistan

Start-ups in Pakistan benefit from a three-year tax exemption, but subsequent high tax rates significantly reduce net profits. There is a lack of targeted support and a complex tax structure that deters new start-ups (Pakistan, 2023, July 30).

b) International Best Practices

The USA offers substantial government incentives, including tax breaks and grants. China provides reduced corporate income tax rates and significant R&D expense deductions. Singapore offers extensive tax incentives and financial support programs to foster a conducive start-up environment (Salminen, 2021).

viii. Monitoring & Evaluation of Support Programs

a) Pakistan

There is a lack of comprehensive metrics and consistent data collection methods, making it difficult to evaluate the effectiveness of start-up support programs (Pakistan, 2023, July 30).

b) International Best Practices

The USA employs robust monitoring and evaluation frameworks with detailed metrics to track the performance of start-up support programs. Singapore regularly reviews its programs to ensure they remain aligned with evolving market needs. India's monitoring systems under the *Startup India* initiative provide valuable insights for continuous improvement (Karandaaz, 2024).

4. SWOT Analysis of Start-up ESOs (Including Incubators & Accelerators) in Pakistan

i. Strengths:

a) Supportive Infrastructure

Incubators and accelerators in Pakistan, such as the National Incubation Centers (NICs) and other Entrepreneurial Support Organizations (ESOs), provide essential infrastructure, mentorship, and networking opportunities that are critical for early-stage start-ups.

b) Government Support

Government initiatives and support programs, such as the *Pakistan Start-up Fund* (which offers 10%-30% of the total investment made by venture capitalists in start-ups) (MoITT, 2024), *BridgeStart Pakistan* (which offers international exposure to young entrepreneurs) (Ignite, 2024), and Pakistan's largest free online training program, *Digiskills.pk* (Digiskills, 2024), are key strengths in supporting start-up development in the country.

c) Sectoral Diversity

Incubators and accelerators in Pakistan support a diverse range of sectors, including fintech, e-commerce, healthtech, edtech, and agritech, which highlights the ecosystem's adaptability and broad scope. Notable start-ups, such as *Airlift* in logistics, *Daraz* and *Bazaar* in e-commerce, and *Easypaisa* and *Finja* in fintech, demonstrate the ecosystem's potential for innovation across different sectors (Iconsultant & Little, 2023).

d) International Interest

Growing interest from international investors, including partnerships with global venture capital firms such as *Tiger Global* and *Kleiner Perkins* (which entered the Pakistani start-up market in 2021), further enhances the credibility and potential of local start-ups (Iconsultant & Little, 2023).

ii. Weaknesses:

a) Resource Constraints

Many incubators and accelerators face financial and operational limitations, which can hinder their ability to provide consistent, high-quality support to start-ups (Iconsultant & Little, 2023).

b) Politico-Economic Instability

Pakistan's political and economic instability negatively impacts the start-up

ecosystem by creating an unpredictable business environment. This instability can deter investment, disrupt supply chains, and reduce consumer spending power. Uncertainty around regulations and economic policies further complicates securing funding, attracting talent, and maintaining consistent operations, stifling innovation and growth in start-ups.

c) Lack of Coordination and Data Collection

There is a lack of coordination and communication among stakeholders of the start-up ecosystem, including ESOs, academia, industry, and government. This results in fragmented support structures, reducing overall efficiency and impact. Additionally, insufficient industry-level data collection and analysis hinder data-driven growth strategies and the ability to measure the impact of start-up initiatives accurately.

d) Quality and Consistency Issues

There are varying levels of quality and effectiveness among different incubators and accelerators, leading to inconsistencies in the support provided to start-ups. These discrepancies can limit the overall success and sustainability of the ecosystem (Iconconsultant & Little, 2023).

iii. Opportunities:

a) Contribution to Economic Development

A thriving start-up ecosystem can significantly contribute to economic development by driving innovation, creating employment opportunities, and boosting GDP growth in Pakistan.

b) Digital Economy

A tech-driven start-up ecosystem will help bridge the digital divide, increase digital inclusivity, and foster a culture of innovation and entrepreneurship, thus contributing to the broader digital economy.

c) Youth Demographics

With around 64% of the population under the age of 30, Pakistan has a large pool of young, tech-savvy individuals who are well-positioned to drive innovation and entrepreneurship.

d) Digital Transformation

With high broadband penetration (around 56.37%) (PTA, 2024) and ongoing digital transformation initiatives, Pakistan's start-up ecosystem is poised to take advantage of a conducive environment for tech-based start-ups to thrive.

iv. Threats:

a) Resource Drain

Start-ups often attract significant amounts of capital and talent, which can sometimes lead to a resource drain from other critical sectors of the economy. High-paying jobs in start-ups and the allure of start-up culture may draw skilled professionals away from traditional industries, such as manufacturing, healthcare, and education. This could result in skill shortages in these sectors, negatively impacting their growth and development (Gompers & Lerner, 2001).

b) Regulatory and Ethical Challenges

The rapid pace of innovation in start-ups can outstrip existing regulatory frameworks, creating challenges for policymakers. Start-ups operating in emerging technologies, such as artificial intelligence, biotechnology, and fintech, may present ethical and regulatory dilemmas that require careful management. For instance, the rise of ride-sharing platforms like *inDrive* and *Uber* has led to regulatory challenges and labor disputes globally, emphasizing the need for adaptive regulatory approaches.

c) Economic Instability

Start-ups, especially in their early stages, are inherently risky with high failure rates. This presents a threat of economic instability if a large portion of the economy becomes reliant on these ventures. The failure of high-profile start-ups could lead to job losses, reduced investor confidence, and potential financial losses for stakeholders. The collapse of the dot-com bubble in the early 2000s is a stark reminder of the risks tied to over-reliance on the success of start-ups (Lerner, 2020).

d) Cybersecurity Risks

Start-ups often operate with limited resources, which can lead to underinvestment in cybersecurity measures. This makes them vulnerable to cyberattacks, which can have significant repercussions, not just for the start-ups themselves, but also for their clients and partners.

5. PESTLE Analysis of Pakistan's Start-up Ecosystem

i. Political

The Pakistani government actively supports the start-up ecosystem through various initiatives, such as the *Start-up Pakistan Program* and the establishment of *National Incubation Centers (NICs)*. These initiatives provide essential resources like mentorship, funding, and infrastructural support. Programs like *BridgeStart* aim to globalize Pakistani start-ups by offering them international exposure, with funding up to PKR 5 million for incubation and acceleration in top global incubators (Desk, 2024). However, political instability, frequent changes in government policies, and unpredictable regulatory environments create uncertainty for start-ups. This volatility poses challenges in long-term planning, decision-making, and business stability, discouraging both domestic and foreign investment.

ii. Economic

Pakistan's start-up ecosystem benefits from a large, young, and tech-savvy population, providing a substantial market for new products and services. Successful start-ups such as *Dawaai*, *Bykea*, and *Daraz* showcase the potential within key sectors like healthcare, transportation, and e-commerce. Despite this potential, economic instability, high inflation, and fluctuating currency values complicate financial planning for start-ups. Limited access to local venture capital exacerbates funding challenges, though international interest in the ecosystem is growing. Initiatives like the *Pakistan Start-up Fund* aim to ease financial pressures by providing equity-free grants to start-ups, but a long-term, sustainable funding model is still a work in progress.

iii. Social

Social and cultural factors have a profound impact on the start-up ecosystem in Pakistan. There is a societal preference for stable, traditional career paths (e.g., government jobs or corporate positions) over entrepreneurial ventures, which fosters a risk-averse mindset. This cultural tendency can deter potential entrepreneurs. Furthermore, gender biases and societal norms continue to limit the participation of women in the start-up ecosystem. Women-led start-ups account for a significantly lower proportion of total investments, indicating a gender disparity that hinders broader participation. Nevertheless, initiatives like NICs and growing awareness around global start-up success stories are gradually shifting attitudes, particularly among the youth, towards embracing entrepreneurship. Increasing digital literacy and the rise of female role models in the start-up space are also helping to overcome these social barriers.

iv. Technological

Technological advancements are a driving force for the growth of Pakistan's start-up ecosystem. With increased internet penetration and mobile connectivity, opportunities for tech-based start-ups have flourished. Companies like *Finja* (financial services) and *Bykea* (transportation) are leveraging technology to solve critical challenges in their respective sectors. However, there are still significant barriers to growth, such as inconsistent internet connectivity and underdeveloped technological infrastructure, particularly in rural areas. Additionally, the slow adoption of emerging technologies, such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, and cloud computing, is impeding the country's broader digital transformation. To foster the growth of tech-based start-ups, continued investment in digital infrastructure and broader access to advanced technologies is essential.

v. Legal

The legal framework for start-ups in Pakistan is complex and fragmented, as no single regulatory body or law specifically addresses the needs of start-ups. Multiple regulatory authorities and legal instruments govern start-up activities, including the *Companies Act 2017*, *Income Tax Ordinance 2001*, and various provincial laws. This lack of a unified legal structure makes compliance burdensome for start-ups. Additionally, inconsistencies between federal and provincial tax regimes further complicate the business environment. The complex and lengthy process of obtaining permits, licenses, and approvals for new ventures, combined with a high tax burden after the initial three-year tax exemption period, remains a significant hurdle. Streamlining the regulatory environment and creating a more start-up-friendly legal framework could enhance the attractiveness of Pakistan as an entrepreneurial hub.

vi. Environmental

Environmental factors are becoming increasingly important for start-ups, particularly those in sectors like agritech, cleantech, and renewable energy. Pakistan faces serious environmental challenges, including water scarcity, air pollution, and the broader impacts of climate change. Start-ups focused on sustainable farming practices, efficient resource management, and clean energy solutions can play a vital role in addressing these environmental issues. However, there is a lack of comprehensive environmental policies and support mechanisms to incentivize environmentally sustainable practices across sectors. As global awareness of environmental sustainability grows, there is a clear opportunity for start-ups to innovate and provide solutions for climate resilience and resource conservation. The government's role in providing clear regulatory frameworks and incentives for green technologies will be essential in promoting a sustainable start-up ecosystem.

CHALLENGES FACED BY PAKISTAN'S START-UP ECOSYSTEM

i. Regulatory/Legal

- i. **Delay and Cost Increase:** The regulatory framework involves multiple agencies, leading to delays and increased costs. The average time to start a business in Pakistan is 16.5 days, significantly higher than the regional average of 9.2 days. (Iconsultant & Little, 2023)
- ii. **Multiple Regulatory Bodies:** Over 20 different regulatory bodies govern various aspects of start-ups, creating confusion and inefficiencies. (Iconsultant & Little, 2023)
- iii. **Lengthy Permit & License Process:** Obtaining necessary permits can take up to 45 days on average, compared to 25 days in neighboring countries. (NTF, 2023)

1. Start-up Incubation and Acceleration

- i. **Resource Constraints:** Only 30% of incubators have access to adequate funding and networks. (Iconsultant & Little, 2023)
- ii. **Limited Capacity to Scale Up:** 60% of start-ups fail to scale beyond the initial stages due to inadequate support. (NTF, 2023)
- iii. **Varying Levels of Support:** The success rate of start-ups varies widely, with only 10% receiving consistent, high-quality support across incubators. (NTF, 2023)

2. Access to Finance

- i. **Restrictive Access to Local Venture Capital:** Only 25% of start-ups secure local venture capital funding. (Iconsultant & Little, 2023)
- ii. **High Inflation and Currency Fluctuations:** The inflation rate in Pakistan for March 2023 was 35.4%, while 23.1% was recorded in February 2024. (Statistics, 2024)
- iii. **Insufficient International Investments:** Foreign investment accounts for only 15% of total start-up funding needs. (Iconsultant & Little, 2023)

3. Skills Development and Capacity Building

- i. **Gap Between Educational Outputs and Industry Needs:** Only 40% of graduates possess skills aligned with start-up needs. (Iconsultant & Little, 2023)
- ii. **Limited Training Programs:** There is insufficient focus on entrepreneurship education, with less than 10% of educational institutions offering comprehensive entrepreneurship training. (NTF, 2023)
- iii. **Need for Mentorship:** There is a lack of experienced mentors, as 70% of start-ups report a lack of access to experienced mentors. (NTF, 2023)

4. Technology Adoption and Innovation

- i. **Inconsistent Internet Connectivity:** As of 2024, approximately 62.7% of Pakistan's population resides in rural areas. Rural areas experience internet speeds up to 50% slower than urban areas. (Bank, 2024)
- ii. **Difficulty Accessing Cutting-edge Technologies:** Only 20% of start-ups have access to advanced tech tools. (NTF, 2023)

- iii. **Slow Digital Transformation:** Pakistan's pace is slower compared to other regions in transforming its traditional processes into modern and technologically advanced techniques. Pakistan ranks 90th out of 100 in digital transformation readiness. (Iconsultant & Little, 2023)
5. **Market Access and Internationalization**
 - i. **Limited Local Market Size:** The domestic market size for start-ups is \$1 billion, much smaller than regional counterparts. (NTF, 2023)
 - ii. **Barriers to Expanding Internationally:** Due to regulatory hurdles and limited networks, only 5% of start-ups successfully expand internationally. (NTF, 2023)
 - iii. **Insufficient Comprehensive Efforts for International Exposure:** Only 15% of start-ups participate in international incubator programs. (Hassan, 2023, January)
6. **Incentives to Start-ups**
 - i. **Limited Financial Support:** Financial incentives cover only 10% of start-up needs. (Iconsultant & Little, 2023)
 - ii. **Lack of Targeted Support:** Pakistan does not have a tailored incentive regime for various sectors. Almost 70% of start-ups find current incentives inadequate for their specific needs. (NTF, 2023)
Additionally, there is a glaring gender gap in Pakistan's start-up ecosystem. Out of the \$277 million invested in Pakistani start-ups in early 2022, only \$1.8 million was raised by the only female entrepreneur. (Iconsultant & Little, 2023)
 - iii. **Complex Tax Structures:** The current tax environment for start-ups in Pakistan presents several challenges, including limited tax exemptions and inconsistencies in sales tax regimes across different provinces (e.g., 5% federally, in Sindh, Punjab, and KPK, but 15% in Baluchistan), further complicating the tax landscape. Start-ups currently benefit from a tax exemption period of only three years, after which they face a high tax rate on profits (29% for regular companies and 21% for small companies in 2022). (Iconsultant & Little, 2023)
7. **Monitoring and Evaluation**
 - i. **Need for Better Performance Metrics:** Approximately 80% of programs lack standardized performance indicators. (NTF, 2023)
 - ii. **Hinders Effectiveness Assessment:** Only 30% of support programs collect consistent data required for monitoring and evaluation purposes. (NTF, 2023)
 - iii. **Limited Feedback from Start-ups:** 60% of start-ups report inadequate feedback mechanisms for continuous improvement. (NTF, 2023)

FAULT LINES

1. **Legal/Regulatory Framework**

The absence of a single authority and a unified set of rules or acts to govern start-ups in Pakistan.
2. **Start-up Incubation and Acceleration**

Financial constraints and a lack of experienced mentors to properly guide emerging entrepreneurs.

3. **Access to Finance**

VCs, angel investors, and other funding sources are reluctant to invest in Pakistan's start-up ecosystem due to the unstable and uncertain political and economic situation.

4. **Skills Development and Capacity Building of Start-up Founders/Entrepreneurs**

The gap between Pakistan's education system/syllabi and the requirements of the tech-driven emerging industry/market.

5. **Technology Adoption and Innovation by Start-ups**

Start-ups in Pakistan are slow to adopt emerging technologies like AI, IoT, and blockchain due to a lesser appetite in the Pakistani market for such tech-driven solutions, as is evident from the low digital literacy rate of 34%. (Mehdi, 2023)

6. **Market Access and Internationalization of Start-ups**

Pakistani start-ups have limited success in both domestic and international markets due to quality and cost issues, making their products less competitive compared to international suppliers like China.

7. **Incentives to Start-ups**

The tax exemption of three years granted to start-ups under the Finance Act, 2017, is insufficient. Moreover, the tax rate after the lapse of three years is very high for SECP-registered start-up companies (up to 29% on profits), resulting in low net profits and returns.

Conclusion

The research into Pakistan's start-up ecosystem reveals a dynamic yet challenging landscape, characterized by significant potential for growth amidst considerable obstacles. Key challenges identified include a complex legal framework, which lacks a single legal instrument and regulatory body for start-ups, posing regulatory hurdles for them, as well as difficulties related to Initial Public Offerings (IPOs), which limit avenues for growth and exit strategies. These regulatory complications often result in a lack of investor confidence and hinder the scalability of promising start-ups.

Furthermore, the ecosystem suffers from a fragmented support structure, with insufficient collaboration between government bodies, private sector stakeholders, and academic institutions. This lack of cohesion restricts access to vital resources, such as funding, mentorship, and technical expertise, which are crucial for nurturing nascent enterprises.

Despite these challenges, the findings highlight several promising initiatives that could pave the way for a more robust start-up ecosystem in Pakistan. Government-led programs like the Pakistan e-Rozgar Program and DigiSkills.pk, along with initiatives such as BridgeStart Pakistan and the Pakistan Start-up Fund, demonstrate a commitment to fostering entrepreneurship. These programs aim to equip aspiring entrepreneurs with

the necessary skills, resources, and exposure to succeed in a competitive market. Additionally, the digital transformation efforts across various sectors, including agriculture, health, and tourism, create new opportunities for innovation and entrepreneurship.

By addressing the identified challenges and leveraging these initiatives, Pakistan has the potential to cultivate a thriving start-up ecosystem that can significantly contribute to economic growth and technological advancement.

Recommendations

Based on the comprehensive analysis of Pakistan's start-up ecosystem, here are the detailed recommendations for creating a conducive environment for IT, business, and industrial start-ups to address the identified challenges and boost the growth of start-ups in the country:

1. Regulatory/Legal Reforms

i. **Simplify the Regulatory Framework:** Simplifying the regulatory framework for start-ups is essential to foster a more conducive environment for entrepreneurship. By establishing a single-window system, start-ups can fulfill all necessary legal and regulatory requirements through a streamlined process. This approach would significantly reduce bureaucratic delays, lower compliance costs, and enhance overall efficiency. Entrepreneurs would be able to focus more on innovation and business development rather than navigating complex administrative procedures, thereby accelerating the growth of the start-up ecosystem.

ii. **Create a Centralized Regulatory Body:** The creation of a centralized regulatory body dedicated to start-ups is crucial for ensuring consistent and coherent policies across the ecosystem. This body would oversee all regulatory requirements, providing start-ups with a clear point of contact for their regulatory needs. It would also facilitate better coordination among various government agencies, ensuring that policies are implemented effectively and efficiently. A centralized authority would help address the unique challenges faced by start-ups, fostering a more supportive regulatory environment.

iii. **Fast-Track Processes for Ancillary Matters:** Implementing technology-driven fast-track processes at relevant departments to handle ancillary matters not covered under the single-window system is vital. These processes would leverage modern technological solutions to expedite administrative tasks, reducing the time and effort required for start-ups to comply with regulatory obligations. By doing so, start-ups can focus on their core business activities, enhancing productivity and innovation. The fast-tracking of ancillary matters would also contribute to a more dynamic and responsive regulatory framework.

2. Incubators and Accelerators

i. **Increase Funding:** Increasing funding for incubators and accelerators is critical to ensure they are well-resourced and capable of providing comprehensive support to start-ups. This can include financial grants, state-of-the-art facilities, and access to global networks of angel investors and venture capitalists. Adequate funding would enable these entities to offer high-quality mentorship, training, and resources, which are essential for the growth and success of start-ups. A well-funded ecosystem would attract more entrepreneurs and foster a culture of innovation and entrepreneurship.

ii. **Develop Scalability Programs:** Developing programs that focus on scaling start-ups beyond the initial incubation stage is essential for sustained growth. These programs should offer advanced training, mentorship, and strategic partnerships among entrepreneurial support organizations (ESOs) to help start-ups expand. Scalability programs would address the challenges faced by start-ups as they transition from early-stage ventures to growth-stage companies. By providing the necessary support and resources, these programs would enable start-ups to achieve their full potential and contribute to economic development.

iii. **Incentives to Incubators & Accelerators, Including Tax Exemptions:** Providing incentives to incubators and accelerators, such as tax exemptions, is crucial for promoting innovation and entrepreneurship. These incentives would reduce financial risks for start-ups, attract and retain talent, and enhance the quality of support services. By fostering regional development, these incentives would create a more vibrant and competitive start-up ecosystem. Moreover, incentivizing incubators and accelerators would drive economic growth, job creation, and the overall success of start-ups.

3. Access to Finance

i. **Encourage Local Investment:** Encouraging local investment through tax incentives for venture capitalists and angel investors is vital for providing start-ups with the necessary funding. Establishing government-backed venture capital funds would further support this initiative by offering financial resources to start-ups. By creating a favorable investment climate, these measures would attract local investors and stimulate economic growth. Encouraging local investment would also foster a sense of community and support within the start-up ecosystem.

ii. **Facilitate International Investments:** Facilitating easier access to international investors is essential for attracting global funding and expertise. Easing foreign exchange regulations and offering incentives for foreign investments would make Pakistan's start-up ecosystem more attractive to global investors. Promoting the ecosystem internationally would also enhance visibility and credibility, drawing more international attention and investment. These efforts would provide start-ups with access to a broader range of resources, networks, and opportunities.

4. Skills Development and Capacity Building of Entrepreneurs

i. **Align Education Programs:** Aligning educational programs with industry needs by incorporating entrepreneurship and technology courses into academic curricula is crucial for preparing future entrepreneurs. Educational institutions should collaborate with industry stakeholders to ensure that curricula are relevant and up-to-date. By fostering an entrepreneurial mindset and equipping students with practical skills, these programs would contribute to the development of a skilled workforce capable of driving innovation and entrepreneurship.

ii. **Capacity Building of Entrepreneurs:** Entrepreneurial support organizations (ESOs), especially national incubation centers (NICs), should focus on providing skills development programs to emerging entrepreneurs. Partnering with tech companies for training programs on emerging technologies, such as artificial intelligence (AI), the Internet of Things (IoT), and blockchain, would enhance the technical capabilities of entrepreneurs. These programs should also include internships to provide hands-on experience. Capacity-building initiatives would equip entrepreneurs with the knowledge and skills needed to succeed in a competitive market.

iii. **Develop a National Mentorship Network:** Developing a national mentorship network that connects experienced entrepreneurs with new start-ups is essential for fostering knowledge transfer and support. This network should include regular workshops, one-on-one mentorship sessions, and peer-to-peer learning opportunities. By leveraging the expertise of seasoned entrepreneurs, new start-ups can gain valuable insights, guidance, and support. A robust mentorship network would contribute to the overall success and sustainability of the start-up ecosystem.

5. Adoption of Emerging Technologies like IoT, AI, and Blockchain by Start-ups

i. **Improve Internet Infrastructure:** Investing in improved internet infrastructure, especially in rural areas, is crucial for supporting tech-based start-ups. Public-private partnerships can accelerate this development, ensuring that all regions have access to reliable, high-speed internet. Enhanced internet infrastructure would enable start-ups to leverage emerging technologies and compete effectively in the digital economy. This investment would also bridge the digital divide, promoting inclusive growth and development.

ii. **Provide Access to Advanced Technologies:** Providing grants and subsidies for start-ups to access advanced technologies is essential for fostering innovation. Establishing tech hubs and innovation labs equipped with IoT, AI, cybersecurity, and blockchain facilities would create an environment conducive to technological advancements. By offering these resources, start-ups can experiment with and develop cutting-edge solutions, driving technological progress and economic growth. Access to advanced technologies would also enhance the global competitiveness of start-ups.

iii. **Promote Digital Transformation:** Promoting digital literacy and the benefits of digital transformation across all sectors is vital for creating a forward-looking economy. Government policies should encourage the adoption of emerging technologies within the start-up ecosystem. By fostering a culture of digital transformation, businesses can improve efficiency, productivity, and innovation. Digital literacy initiatives would also ensure that the workforce is equipped with the skills needed to thrive in a technology-driven world.

6. Market Access and Internationalization

i. **Support Global Market Entry:** Facilitating participation in international trade fairs and exhibitions with government support is essential for helping start-ups access global markets. These platforms provide opportunities for start-ups to showcase their products and services, network with potential partners, and gain international exposure. By supporting global market entry, the government can help start-ups expand their reach and compete on a global scale. This initiative would also promote the country's innovation capabilities and attract foreign investment.

ii. **Simplify Export Procedures:** Simplifying export procedures and reducing tariffs for tech products would make it easier for start-ups to penetrate foreign markets. Offering incentives for start-ups that successfully export their products would further encourage international expansion. By removing bureaucratic barriers and providing financial support, the government can enhance the global competitiveness of start-ups. Simplified export procedures would also streamline operations and reduce costs for start-ups.

iii. **Enhance Global Exposure:** Expanding programs like BridgeStart that support start-ups in accessing international incubators and accelerators is crucial for enhancing global exposure. Fostering partnerships with global tech hubs would facilitate knowledge exchange and collaboration. By providing opportunities for start-ups to engage with international markets and ecosystems, these programs would accelerate growth and innovation. Enhancing global exposure would also attract foreign talent and investment, enriching the local start-up ecosystem.

7. Enhancing Incentives and Stakeholder Engagement

i. **Increase Financial Incentives:** Increasing financial incentives, such as tax breaks, grants, and subsidies tailored to different sectors and stages of start-ups, is essential for fostering growth. Promoting these incentives widely would ensure that start-ups are aware of and can benefit from them. Financial incentives would reduce the financial burden on start-ups, allowing them to reinvest in their businesses and scale effectively. By providing targeted support, the government can address specific needs and challenges faced by start-ups. Moreover, by providing targeted support, the government can also ensure gender inclusivity.

ii. **Develop Sector-Specific Support Programs:** Developing sector-specific support programs to address unique challenges and opportunities in different

industries is vital for a well-rounded start-up ecosystem. Involving industry experts in the design and implementation of these programs would ensure their relevance and effectiveness. Sector-specific support programs would provide tailored resources, mentorship, and funding, enabling start-ups to navigate industry-specific challenges. This approach would foster innovation and growth across various sectors.

iii. **Simplify Tax Regulations:** Simplifying tax regulations for start-ups is crucial for reducing administrative burdens and promoting compliance. Making tax regulations easier to understand and comply with would encourage more start-ups to formalize their operations. Consideration should also be given to implementing a lower tax rate for start-ups in their initial years to support growth and reinvestment. Simplified tax regulations would create a more business-friendly environment, fostering entrepreneurship and economic development.

8. Monitoring and Evaluation of Start-up Support Programs

i. **Standardized Metrics for Evaluation:** Developing a standardized framework for monitoring and evaluating start-up support programs is essential for assessing their impact. Using metrics such as job creation, revenue growth, and innovation outputs would provide a comprehensive understanding of the effectiveness of these programs. Standardized metrics would also facilitate comparisons across different programs, helping to identify best practices and areas for improvement. This approach would ensure that resources are allocated effectively and programs deliver the desired outcomes.

ii. **Implement Consistent Data Collection:** Implementing uniform data collection methods across all support programs is crucial for ensuring the consistency and reliability of data. Digital tools should be utilized to facilitate real-time data collection and analysis, providing accurate and timely information. Consistent data collection would enable better tracking of program performance and impact. By leveraging data-driven insights, policymakers can make informed decisions and continuously improve support programs.

iii. **Establish Feedback Mechanism:** Establishing regular feedback loops with start-ups is crucial for the continuous improvement of support programs. By creating platforms where start-ups can share their experiences and provide constructive feedback, policymakers and support organizations can gain valuable insights into the effectiveness of their initiatives. Additionally, incorporating feedback into the decision-making process allows for the dynamic adjustment of programs to better meet the evolving needs of the start-up ecosystem.

LOG MATRIX

#	Action	KPI	Executing Authority	Timeline	Period
1. Legal/ Regulatory Framework					
1	Form a government committee to draft a comprehensive startup policy, consolidating and optimizing all regulations under one framework.	Number of policy drafts completed and reviewed within the time assigned. Number of stakeholder consultations held during the policy drafting process.	Ministry of Information Technology and Telecommunication	Short term	2 months
2	Establish a dedicated authority for startup regulation and support, streamlining the registration and compliance processes.	Time taken to register a new startup reduced by 50% within one years. Bring 50% of the Universities incubators under one network within one year.	Cabinet Division	Medium term	1 year
2. Start-up Incubation and Acceleration					
3	Increase government and private sector funding for incubators and accelerators to enhance their resources and capabilities.	Percentage increase in funding for incubators and accelerators annually. Number of startups successfully incubated or accelerated each year.	Ministry of Finance	Long term	2 years
4	Develop a national mentorship program that connects experienced entrepreneurs and industry experts with startups, providing them with tailored guidance.	Number of mentors enrolled in the program. Number of startups receiving mentorship and their growth metrics (revenue, funding, etc.).	Ministry of Information Technology and Telecommunication	Medium term	6 months
3. Access to Finance					
5	Introduce investment	Number of new investments made	Ministry of Finance	Medium term	1 year

	incentives such as tax breaks and matching funds for VCs and angel investors who invest in local startups.	by VCs and angel investors in local startups. Amount of capital raised by startups through these incentives.			
6	Establish a stability fund to mitigate risks associated with political and economic instability, encouraging investment in startups.	Amount of funds allocated to the stability fund. Number of startups receiving investment support from the stability fund.	Ministry of Finance	Medium term	6 months

#	Action	KPI	Executing Authority	Timeline	Period
4. Skills Development and Capacity Building of Startup Founders/ Entrepreneurs					
7	Revise educational curricula to include practical training in emerging technologies and entrepreneurship.	Number of educational institutions implementing the revised curriculum. Number of students completing courses in emerging technologies and entrepreneurship.	Ministry of Federal Education & Professional Trainings with collaboration with Provincial Education Department	Long term	1 year
8	Launch partnerships between universities and the tech industry to provide internships and hands-on training programs for students.	Number of partnerships established between universities and tech companies. Number of students participating in internships and training programs.	Ministry of Federal Education & Professional Trainings with collaboration with Provincial Education Department	Medium term	6 months

5. Technology Adoption and Innovation by Startups					
9	Offer grants and subsidies to startups for the adoption and integration of advanced technologies like AI, IoT, and blockchain.	Number of grants and subsidies awarded to startups. Percentage increase in the adoption of advanced technologies among startups.	NIC, Islamabad	Long term	1 year
10	Organize tech literacy campaigns to raise awareness and understanding of digital technologies among potential users and customers.	Number of tech literacy events and campaigns conducted. Number of participants attending tech literacy events.	Ministry of Information Technology and Telecommunication and NIC, Islamabad	Medium term	6 months
6. Market Access and Internationalization of Startups					
11	Implement quality improvement programs and certifications to help startups meet international standards.	Number of startups obtaining quality certifications. Number of products meeting international standards.	Ministry of Info. Technology and Tele. and NIC, Islamabad	Medium term	6 months
12	Establish export promotion initiatives and trade fairs to help startups showcase their products in domestic & international markets.	Number of startups participating in trade fairs and export initiatives. Increase in export sales for participating startups.	Ministry of Commerce and Trade and Ministry of IT & T	Medium term	1 year

#	Action	KPI	Executing Authority	Timeline	Period
7. Incentives to Startups					
13	Extend the tax exemption period from three to five years for SECP registered startups.	Number of startups benefiting from extended tax exemptions. Average tax savings per startup due to extended exemption.	Ministry of Finance and Federal Board of Revenue	Long term	1 year
14	Reduce the tax rate on startup profits post-exemption period to a more competitive level, such as 15-20%, to encourage growth and reinvestment.	Number of startups benefiting from reduced tax rates. Increase in net profits and reinvestment rates among startups.	Ministry of Finance and Federal Board of Revenue	Long term	1 year

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Import Substitutions and Export Promotion for Improving Balance of Trade

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Abstract:

This paper examines Pakistan's persistent trade deficit and explores strategies for addressing it through import substitution and export promotion. It evaluates past trade policies and provides an in-depth analysis of the Strategic Trade Policy Framework (STPF) 2020-25, emphasizing sectoral collaboration and targeted interventions. By benchmarking Pakistan's policies against successful global trade models, such as those of Singapore and Germany, the paper identifies areas for improvement, including trade digitization, export financing, and market diversification. A SWOT analysis highlights the strengths, weaknesses, opportunities, and threats in Pakistan's trade institutions, while a PESTLE analysis examines the broader political, economic, social, technological, legal, and environmental factors affecting trade. The paper proposes a transformative strategy inspired by global best practices, including trade policy digitization, the establishment of an export bank, and market diversification initiatives. It also advocates for aggressive local content policies and the creation of a development bank to support domestic manufacturing. These measures aim to drive sustainable economic growth and enhance Pakistan's trade resilience.

Key words:

Trade Deficit, Import Substitution, Export Promotion, Strategic Trade Policy, Market Diversification.

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Introduction

Pakistan's trade deficit has been a persistent issue, hindering economic growth and development. The country's imports have consistently exceeded its exports, resulting in a significant trade deficit (Abdul Ghafoor Awan, 2019). As a result, the country's foreign exchange reserves have declined, leading to a depreciation in the value of the Pakistani rupee. The trade deficit has also limited the country's ability to invest in development projects, ultimately hindering economic growth (Israr Ahmed, 2022).

Pakistan's trade scenario is characterized by a heavy reliance on imports to meet domestic demand (Khan, 2023). The country imports a significant amount of machinery, electronics, and raw materials, while its exports are primarily composed of textiles, clothing, and food products. This imbalance is due to various factors, including a lack of competitiveness, inadequate infrastructure, and inefficient trade policies (Allah Bux Lakhan, 2021).

Import substitution and export promotion are two strategies that have been proposed to address Pakistan's trade deficit. Import substitution involves promoting domestic production to replace imports, while export promotion focuses on incentivizing exporters to increase exports (Muhammad Asif, 2021). These strategies have been successfully implemented in various countries, including India, China, and South Korea, contributing to their economic growth and development (Amsden, 2004).

In the context of Pakistan, import substitution and export promotion offer a promising solution to the country's trade deficit. By promoting domestic production and increasing exports, Pakistan can reduce its reliance on imports, increase foreign exchange earnings, and promote economic growth (Shahid Satar, 2023). However, the implementation of these strategies requires careful planning, coordination, and execution. This paper highlights the formation and impact of the Prime Minister's Task Force, which drives these initiatives, emphasizing the importance of import substitution, industrialization, and strategies for boosting Pakistan's exports. By examining the synergy between these strategies, the analysis aims to shed light on their collective impact on Pakistan's balance of trade.

Statement of the Problem

Pakistan's persistent trade deficit, resulting from a heavy reliance on imported goods and a lack of competitiveness in exports, has hindered economic growth and development. The country's trade deficit has consistently exceeded 5% of GDP, posing a significant threat to macroeconomic stability. This has led to the depletion of foreign exchange reserves, increased inflation, and rising poverty levels.

This research aims to investigate the potential of import substitution and export promotion strategies to address these challenges and improve Pakistan's balance of trade, with the goal of informing policy decisions aimed at promoting economic growth and development.

Scope of the Study

This research paper aims to explore the potential of import substitution and export promotion as strategies for improving Pakistan's balance of trade. The paper will examine the current trade scenario, identify areas for improvement, and discuss the benefits and challenges of implementing import substitution and export promotion policies. The findings of this research will provide valuable insights for policymakers, entrepreneurs, and other stakeholders interested in promoting Pakistan's economic growth and development.

Research Methodology

The research employs a mixed-methods approach, combining both quantitative and qualitative data to examine Pakistan's trade dynamics.

Situational Analysis of the Export Sector and Its Contribution to the Economy of Pakistan

Contributions of Pakistan's Export Sector to the Economy:

The contributions of Pakistan's export sector are both quantifiable and far-reaching. Export earnings constitute a substantial portion of the country's GDP, accounting for over 10% of total output. In the fiscal year 2020-21, Pakistan's exports surpassed the \$25 billion mark, highlighting the sector's significant economic contribution. Furthermore, export revenues play a vital role in stabilizing the balance of payments, with the trade surplus reaching \$3.3 billion in the same fiscal year (Bader, 2006; Pakistan Development Update: Reviewing Exports, 2021).

Moreover, the export sector serves as a key engine for employment generation, particularly in rural areas. The textile industry alone employs over 15 million people, making it the largest source of industrial employment in Pakistan (Pakistan Bureau of Statistics, External Trade Section I. Report on External Trade, 2023). Additionally, export-oriented industries attract foreign direct investment (FDI), facilitating technology transfer, skills development, and infrastructure enhancement. In the fiscal year 2020-21, Pakistan attracted FDI worth \$2.78 billion, with significant investments in sectors such as manufacturing, services, and telecommunications.

Top Export Destinations Showing Decrease (Trade Values in USD Million)

Export Destinations	July-June Fy'2022-23	July-June Fy'2021-22	% Change
United States	5,285	6,831	-22.60%
China	2,555	3,058	-16.40%
United Kingdom	1,920	2,167	-11.40%
Netherlands	1,576	1,662	-5.20%
Germany	1,567	1,771	-11.50%
Belgium	711	799	-11%
Bangladesh	705	953	-26.10%
France	493	512	-3.80%
Canada	370	464	-20.30%
Malaysia	369	467	-20.90%

Source: Trade Development Authority of Pakistan (TDAP)

Top Export Destinations Showing Increase (Trade Values in USD Million)

Export Destinations	July Fy2022-23	June	July-June Fy2021-22	% Change
Spain	1,432		1,249	14.60%
United Arab Emirates	1,416		1,348	5.10%
Italy	1,173		1,137	3.20%
Afghanistan	984		733	34.20%
Saudi Arabia	562		423	32.80%
Kenya	311		264	17.80%
Tanzania	167		122	36.80%
Indonesia	152		128	18.70%
Greece	135		120	12%
Mexico	131		108	20.90%

Source: Trade Development Authority of Pakistan (TDAP)

Import Sources	JULY-JUNE FY 2023	JULY-JUNE FY 2022	% Change
Singapore	965	904	7%
Afghanistan	893	801	11%
Iran	881	774	14%
Russian Federation	846	458	85%
Oman	812	796	2%
Australia	772	477	62%
Canada	492	307	61%
Argentina	261	199	31%
Romania	237	68	249%
Nigeria	211	154	36%

Top Import Sources Showing increase (Trade Values in USD Million)

Source: Trade Development Authority of Pakistan (TDAP)

TOP IMPORT SOURCES SHOWING DECREASE (FY2023 V/S FY2022)

Import Sources	JULY-JUNE FY2023	JULY-JUNE FY2022	% Change
China	11702	20839	-44%
UAE	5501	8663	-37%
Indonesia	4319	4619	-6%
Saudi Arabia	4190	5148	-19%
Qatar	3567	3582	0%
Kuwait	2254	3081	-27%
United States	2033	3764	-46%
Japan	1053	2194	-52%
Thailand	1010	1798	-44%
Malaysia	890	1302	-32%

Source: (Ministry of Commerce | Government of Pakistan)

Pakistan's export sector stands as a cornerstone of its economy, poised with immense potential and formidable challenges. Nestled at the nexus of Asia, Europe, and the Middle East, Pakistan's strategic geographic location provides access to pivotal global markets. This positioning, complemented by a rich tapestry of natural resources spanning agriculture, minerals, and textiles, underscores the country's significant export potential. Moreover,

burgeoning sectors such as information technology, pharmaceuticals, and engineering goods offer promising avenues for diversification and growth (Ayesha Afgun, 2022; Pakistan Export Data | Pakistan Trade Data, n.d.).

Pakistan's export potential is substantiated by concrete data. The nation's geographic positioning enables it to access over 3 billion people across South Asia, Central Asia, and the Middle East, constituting a vast market for its exports. Additionally, Pakistan ranks among the top producers of key export commodities, including cotton (the fourth-largest producer globally), rice (the fourth-largest exporter), and leather goods (a major player in the global leather industry). These resources serve as the bedrock for export-oriented industries, driving economic growth and international trade (Pakistan Export Data | Pakistan Trade Data).

Furthermore, the emergence of non-traditional export sectors highlights the country's diversification efforts. Pakistan's IT exports during July-March FY2022 surged to US \$1.948 billion, marking a growth rate of 29.26 percent compared to US \$1.5 billion in the same period last year. These include telecommunication, computer, and information services (Pakistan Economic Survey, 2022). Similarly, the pharmaceutical industry, with an export value of \$3.29 billion in 2023, contributing approximately 1% to the country's GDP, is another significant emerging sector (Pakistan Export Strategy Pharmaceuticals, 2023).

Potential Sectors for Import Substitution and Export Promotion

The priority sectors were identified by analyzing international demand trends and assessing the capacity and capabilities of Pakistan's various export sectors. The main guiding principle was to focus efforts and interventions on sectors that offer the greatest export opportunities and potential returns. Additionally, the process was aligned with the government's broader policy priorities in textiles, agriculture, engineering, automotive, food processing, pharmaceuticals, and services. The Ministry of Commerce has designated the following priority sectors, divided into traditional and developmental categories.

Traditional Sectors	Developmental Sectors
<ol style="list-style-type: none"> 1. Textile & Apparel 2. Leather 3. Surgical Instruments 4. Sports Goods 5. Carpets 6. Rice 7. Cutlery 	<ol style="list-style-type: none"> 1. Engineering Goods (incl. Auto Parts) 2. Pharmaceutical 3. Marble & Minerals 4. Processed Food & Beverages 5. Footwear 6. Gems & Jewelry 7. Chemicals 8. Meat & Poultry 9. Fruits & Vegetables 10. Sea Food 11. Services Sector (Special focus on IT, Transport, Logistics & Tourism)

Source: (Ministry of Commerce | Government of Pakistan)

Pakistan Export Sector's Potential

Pakistan has a diverse range of export products, including textiles, agricultural goods, sports goods, and surgical instruments. The country's strategic location, serving as a gateway to the Middle East, Central Asia, and South Asia, provides significant logistical advantages for trade.

Potential of the Textiles and Apparel Sector in Pakistan

Pakistan's textiles and apparel sector is a cornerstone of the country's economy, holding significant potential for growth and development. This sector's potential is rooted in several key factors, including abundant raw materials, a skilled workforce, and strategic government initiatives.

Abundant Raw Materials

The country's favorable climate and extensive agricultural base support high cotton yields, providing a steady supply of raw materials for textile manufacturing. This domestic availability of cotton not only reduces dependency on imports but also lowers production costs, giving Pakistan a competitive edge in the global market.

Skilled Workforce

The industry employs millions of workers, many of whom possess specialized skills in spinning, weaving, dyeing, and garment manufacturing.

Government Initiatives and Policies

The Pakistani government has implemented several initiatives to bolster the textiles and apparel sector. These include financial incentives, tax rebates, and subsidies aimed at enhancing production capacity and export competitiveness.

1. **Textile Policy 2020-2025:** This policy aims to increase textile and apparel exports to \$25 billion by 2025 through various measures such as technological upgrades, infrastructure development, and market diversification (RDA Cell, Ministry of Commerce).
2. **Duty Drawback of Taxes (DDT):** This scheme provides rebates on the taxes paid on inputs used in the manufacturing of export goods, thereby reducing the cost of production and enhancing competitiveness.

Potential of the Agriculture Sector in Pakistan

With a large agrarian base, Pakistan has the potential to increase its exports of rice, fruits (especially citrus and mangoes), and vegetables. The development of agro-based industries can also enhance value addition and export revenues. The agriculture sector in Pakistan is a critical component of the country's economy, contributing significantly to GDP, employment, and exports.

Contribution to GDP and Employment

The agriculture sector is a cornerstone of Pakistan's economy, contributing 19.3% to GDP and employing 38.5% of the labor force. This underscores the sector's importance in providing livelihoods and supporting economic stability.

Major Crop Production

The production data for major crops such as wheat, rice, maize, sugarcane, and cotton highlight the sector's capacity to sustain both domestic needs and export demands. For instance, wheat production stands at 26 million tons, which is a significant portion of the country's staple food supply.

Export Destinations

The United States, European Union, and China are significant markets for Pakistani agricultural products. The diversification of export destinations indicates broad market appeal and potential for expansion.

Product Breakdown

Rice is the leading agricultural export product, followed by fruits and vegetables. This diversification within agricultural exports demonstrates the sector's ability to cater to various international markets and consumer preferences.

Potential of the Information Technology Sector in Pakistan

Pakistan's Information Technology (IT) sector has shown significant growth in recent years, emerging as a key player in the global IT landscape.

Contribution to GDP and Employment

The IT sector contributes 1.5% to Pakistan's GDP and employs over 300,000 professionals. The sector's rapid growth and high employment potential demonstrate its critical role in the country's economy.

Growth in IT Exports

The growth in IT exports from \$300 million in 2010 to \$3.5 billion in 2023 showcases a remarkable annual growth rate of approximately 20%. This indicates a robust upward trajectory and a strong foundation for future expansion.

Major Export Destinations

The United States, United Kingdom, and Canada are the primary markets for Pakistani IT services, accounting for a significant portion of the export revenue. This indicates strong international demand and the global competitiveness of Pakistan's IT sector.

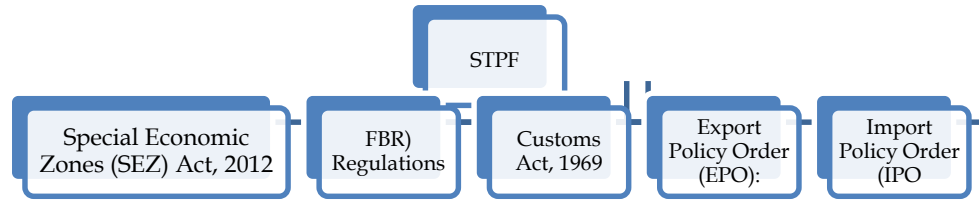
Service Type Breakdown

Software development is the leading export service, followed by IT-enabled services, BPO services, and freelance work. This diversity in service offerings highlights the sector's versatility and ability to cater to various segments of the global market.

Existing Legal and Institutional Framework for Promotion of Exports and Substitution of Imports in Pakistan

The legal and institutional framework for promoting exports and substituting imports in Pakistan is comprehensive, encompassing various laws, regulations, and organizations dedicated to enhancing the country's trade performance. The government's commitment to developing and

implementing trade policies, coupled with the efforts of key institutions like the Ministry of Commerce, TDAP, FBR, and SBP, reflects a concerted effort to boost economic growth through strategic trade management. Below are the legal and institutional organizations working to promote exports and substitution of imports in Pakistan.



Trade Policy Framework

Pakistan's trade policies are primarily shaped by the Strategic Trade Policy Framework (STPF), which outlines the country's trade objectives, strategies, and initiatives for a specified period. The STPF aims to enhance export competitiveness, diversify the export base, and promote value addition. The framework includes various incentives for exporters, such as reduced tariffs on raw materials and semi-finished goods, tax holidays, and subsidies for export-oriented industries.

Import Policy Order (IPO)

The IPO governs the import of goods into Pakistan. It includes regulations aimed at controlling the import of luxury items, reducing the import bill, and encouraging the consumption of domestically produced goods. The IPO also lists items that are banned or restricted for import, aligning with the import substitution policy by promoting local manufacturing.

Export Policy Order (EPO)

The EPO sets the rules and regulations for exporting goods from Pakistan. It includes measures to streamline export procedures, reduce bureaucratic hurdles, and provide incentives to exporters. The EPO is designed to make Pakistani exports more competitive in international markets by simplifying the export process and reducing costs.

Customs Act, 1969

This act regulates the import and export of goods, ensuring compliance with trade policies. It provides the legal basis for customs duties, procedures for import and export clearances, and measures to prevent smuggling. Amendments to the Customs Act are often made to facilitate trade and align

with international best practices.

Federal Board of Revenue (FBR) Regulations

The FBR is responsible for tax administration, including customs duties, sales tax, and income tax related to imports and exports. FBR regulations aim to simplify tax procedures, reduce the cost of compliance, and provide tax incentives to exporters.

Special Economic Zones (SEZ) Act, 2012

This act provides the legal framework for the establishment of SEZs in Pakistan. SEZs offer a range of incentives, including tax holidays, duty-free import of machinery, and streamlined regulatory procedures, to attract investment in export-oriented industries and promote import substitution.

Institutional Framework

Ministry of Commerce

The Ministry of Commerce is the primary government body responsible for formulating and implementing trade policies in Pakistan. It oversees the development and execution of the Strategic Trade Policy Framework, negotiates trade agreements, and promotes Pakistani exports globally.

Trade Development Authority of Pakistan (TDAP)

TDAP is the principal agency tasked with promoting and developing Pakistan's exports. It provides support to exporters through market research, trade missions, international exhibitions, and capacity-building programs. TDAP also collaborates with international trade bodies to enhance market access for Pakistani products.

Federal Board of Revenue (FBR)

The FBR administers customs and tax policies related to imports and exports. It plays a crucial role in facilitating trade by streamlining customs procedures, reducing clearance times, and ensuring compliance with trade regulations. The FBR's efforts to modernize customs processes aim at enhancing trade efficiency and reducing costs for exporters and importers.

State Bank of Pakistan (SBP)

The SBP implements monetary and exchange rate policies that affect trade. It provides various financial incentives to exporters, including concessional financing through the Export Finance Scheme (EFS) and the Long-Term Financing Facility (LTFF). The SBP also works to ensure a stable exchange rate

environment, which is crucial for trade competitiveness.

Board of Investment (BOI)

The BOI promotes foreign direct investment (FDI) in Pakistan, particularly in sectors that contribute to export growth and import substitution. It facilitates investors by providing information, coordinating with relevant government departments, and ensuring a conducive business environment. The BOI's efforts are geared towards attracting investment in manufacturing, technology, and other high-value sectors.

Pakistan Customs

An arm of the FBR, Pakistan Customs is responsible for regulating the flow of goods in and out of the country. It plays a critical role in enforcing import and export policies, collecting duties, and preventing illegal trade. Pakistan Customs is also involved in trade facilitation initiatives, such as the implementation of the Pakistan Single Window (PSW) project, which aims to simplify trade processes.

Small and Medium Enterprises Development Authority (SMEDA)

SMEDA supports the development of small and medium enterprises (SMEs), which are crucial for both import substitution and export growth. It provides technical assistance, business development services, and access to finance for SMEs, helping them enhance their competitiveness and integrate into global value chains.

Engineering Development Board (EDB)

The EDB promotes the engineering sector in Pakistan, focusing on increasing local production of engineering goods to substitute imports and boost exports. It facilitates industry linkages, provides technical support, and advocates for favorable policies to strengthen the engineering industry.

Export Processing Zones Authority (EPZA)

EPZA oversees the development and management of export processing zones (EPZs) in Pakistan. EPZs offer special incentives to manufacturers, such as tax exemptions and simplified customs procedures, to encourage export-oriented production and attract foreign investment.

Chambers of Commerce and Industry

Various chambers of commerce and industry associations play a significant role in advocating for the interests of the business community. They engage

with the government on policy issues, provide input on trade regulations, and support businesses in navigating export and import procedures.

Critical Appraisal of Previous Trade Policies

Pakistan's previous trade policies have not been able to alter the export paradigm. These policies failed to address supply constraints due to weak emphasis on and implementation of long-term structural and systemic reforms.

Until 2008, the Ministry of Commerce (MOC) had been formulating Annual Trade Policies (ATPs). The ATPs were replaced by a holistic three-year policy, which remained operational until 2018. In 2020, the first five-year plan framework, the Strategic Trade Policy, was formulated and operationalized for the period 2020 to 2025 to broaden the scope of the policy and bring continuity and predictability.

The first three-year plan was launched for the years 2009-12, the second three-year plan was for 2012-15, and the third one was for 2015-18. Despite the policy initiatives and the inclusion of key export growth enablers, the goals stipulated in the previous policies were not achieved due to the following challenges:

- A lack of cohesion and ineffective coordination within the government hampered the successful implementation of the trade policy. The responsibility for executing key enablers was dispersed across various ministries and provinces.
- The absence of an effective monitoring and evaluation mechanism prevented the assurance of intervention effectiveness, as periodic reviews of the policies were not conducted.
- An unrealistic exchange rate was a major factor contributing to the continuous decline and stagnation in Pakistan's exports during the period of previous trade policies.
- High tariffs on primary and intermediate inputs also made Pakistan's exports non-competitive.
- The fragmented nature of the industry across all exporting sectors in the country, particularly in textiles, was another cause of stagnant export growth over the years. This fragmentation hindered the export of value-added goods, product innovation, standardization, and achieving real economies of scale.
- Inadequate disbursement of funds often led to partial or non-implementation of policy initiatives. For example, for the three-year trade policy 2015-18, out of the budget allocation of PKR 20 billion, only PKR 1 billion was released during the entire policy period.
- Policy advocacy by the industry remained mainly focused on protection-seeking rather than improving competitiveness and efficiencies.

- There was a policy disconnection with global production and value chains.
- A major cause of stagnation and decline in Pakistan's exports in recent years has been the disconnect between export growth strategies and investment policies, resulting in a lack of investment in export-oriented manufacturing.
- The policy instruments remained unchanged in previous trade policies.

Strategic Trade Policy Framework (STPF) 2020-25

Based on an analysis of past trade policies and an examination of the causes behind suboptimal export performance and gaps in policy implementation, it was decided to revisit the policy framework. This policy document will be dynamic, with provisions for periodic reviews of proposed interventions every six months and the introduction of new initiatives as needed. To achieve sustainable rapid export growth, a comprehensive strategy has been developed to:

- (a) Optimize the growth of existing sectors in the short term,
- (b) Diversify into new sectors identified through stakeholder engagement in the medium term, and
- (c) Identify innovation-driven export sectors for support interventions in the long term.

Pillars of STPF 2020-25

This Strategic Trade Policy Framework is based on the following pillars:

- (i) Making exports a national priority and the primary driver of inclusive and sustainable economic growth, while also serving as the main viable source of foreign exchange earnings.
- (ii) Improving exports through a collaborative and unified national effort involving all relevant ministries, departments, government agencies, and the private sector to ensure policy coherence.
- (iii) Introduction of strategic interventions in priority sectors under the "Make in Pakistan" initiative.
- (iv) Aligning the trade policy with the macroeconomic framework and other national policies, including taxation, revenue, textiles, and industrial policy.

Guiding Principles

The following are the guiding principles of STPF:

- (i) There will be no duties or taxes on exports. The duty drawback mechanism will be reviewed by the end of 2020-21 to simplify, ensure certainty, and automate it.
- (ii) There shall be continuously competitive energy prices for export-oriented sectors.
- (iii) Export enhancement support and incentive initiatives should be

simplified, made certain, automated, performance-oriented, and time-bound. The scope of initiatives should be expanded for priority sectors.
(iv) An institutionalized mechanism will be established for robust monitoring and implementation of the STPF to minimize policy implementation gaps. These gaps have traditionally been a weak link due to the multi-organizational roles in the export ecosystem.

Comparative Analysis of Export Promotion and Import Substitution Policies: Pakistan vs. Global Best Practices

Export Promotion Policies (Pakistan's Approach)

1. **Strategic Trade Policy Framework (STPF):** The STPF is designed to enhance export competitiveness, diversify the export base, and promote value addition. Key elements include duty drawbacks, export refinancing schemes, and tax exemptions. The framework targets specific export growth milestones, such as reaching \$46 billion in exports by 2025.
2. **Export Policy Order (EPO 2022):** The EPO simplifies export procedures and provides financial incentives, like export rebates and tax exemptions. It aims to streamline export documentation and reduce costs for exporters, thereby improving global competitiveness.
3. **Trade Development Authority of Pakistan (TDAP 2006):** TDAP supports exporters through market research, trade missions, international exhibitions, and capacity-building programs. It collaborates with international trade bodies to enhance market access for Pakistani products.

Global Best Practices Singapore:

- **TradeNet System:** Singapore's TradeNet is an electronic data interchange system that streamlines import, export, and transshipment documentation. This system has significantly reduced processing time and costs, making trade more efficient and competitive. With TradeNet, traders can submit their trade declarations and supporting documents electronically, eliminating the need for physical paperwork. This has reduced the processing time for trade declarations from several days to just a few hours (Case Study: Singapore TradeNet® | CrimsonLogic, n.d.).
- **Export Incentives:** Singapore offers various incentives to encourage export growth, including tax relief and grants for market development and export promotion. For example, the Singapore government provides a tax exemption scheme for foreign-sourced income, which allows companies to enjoy tax exemptions on their foreign-sourced income for up to five years. Additionally, the government offers grants for companies

to explore new markets, develop new products, and enhance their international competitiveness (SINGAPORE CUSTOMS, 2012).

South Korea:

- **KOTRA (Korea Trade-Investment Promotion Agency):** KOTRA is a government agency that provides comprehensive support to exporters, including market intelligence, trade missions, and financial incentives. KOTRA has a global network of offices that provide market research, trade facilitation, and investment promotion services to Korean companies. KOTRA also organizes trade missions and exhibitions to help Korean companies explore new markets and establish business relationships with foreign buyers (Korea Trade-Investment Promotion Agency - Company Profile and News - Bloomberg Markets, n.d.).
- **Export-Import Bank of Korea:** The Export-Import Bank of Korea provides financing solutions to support South Korean exporters in international markets. The bank offers a range of financial products, including export loans, guarantees, and insurance, to help Korean companies finance their export transactions. The bank also provides financing for foreign buyers to purchase Korean products and services (The Export-Import Bank of Korea (KEXIM) | Export Credit Agency (ECA) in Korea, n.d.).

Germany:

- **Trade Promotion Programs:** Germany's trade promotion programs, supported by institutions like the German Trade & Invest (GTAI), offer extensive market analysis, financial incentives, and export credit insurance. The GTAI provides market research and analysis to help German companies identify new business opportunities abroad. The agency also offers financial incentives, such as grants and loans, to support export growth. Additionally, the GTAI provides export credit insurance to protect German companies against non-payment risks in foreign markets (GTAI - Invest in Germany, n.d.).
- **Mittelstand Support:** Germany places a strong emphasis on supporting its SMEs (Mittelstand) through various export promotion initiatives. The German government provides a range of programs and services to help SMEs export their products and services, including training and consulting services, market research, and financial incentives. The government also provides support for SMEs to participate in trade fairs and exhibitions, and to establish business relationships with foreign buyers.

Import Substitution Policies (Pakistan's Approach) Import Policy Order (IPO 2022)

- Regulates imports to protect domestic industries and conserve foreign exchange.
- Imposes higher tariffs on luxury items to discourage imports and encourage local production.
- Restricts or bans non-essential goods to prioritize essential imports.
- Tariffs are adjusted based on the Harmonized System (HS) code, which categorizes goods into different categories.
- The IPO is reviewed and updated regularly to reflect changes in the economy and trade policies.

Special Economic Zones (SEZ) Act, 2012

- Establishes SEZs to attract investment in manufacturing and exports.
- Offers tax holidays for a specified period to reduce the tax burden on investors.
- Provides duty-free import of machinery and equipment to reduce the cost of setting up businesses.
- Offers other incentives, such as subsidized utilities and infrastructure support.
- SEZs are designated areas with streamlined regulations and procedures to facilitate business operations.

Small and Medium Enterprises Development Authority (SMEDA)

- Supports SMEs through technical assistance, training, and business development services.
- Provides access to finance through loan schemes, grants, and equity investments.
- Offers marketing support and assistance in accessing domestic and international markets.
- Helps SMEs adopt new technologies and improve productivity.
- SMEDA has established business development centers and incubators to support start-ups and entrepreneurs.

Tariff Rationalization

1. Adjusts tariffs to protect domestic industries and encourage import substitution.
2. Tariffs are reduced or eliminated on raw materials and intermediate goods to support local production.
3. Tariffs are increased on finished goods to discourage imports and encourage local manufacturing.
4. Tariff rationalization is done regularly to reflect changes in the economy and trade policies.

Local Content Requirements

- Mandates the use of local content in certain industries, such as automotive and electronics.
- Requires manufacturers to use a minimum percentage of local components in their products.
- Encourages local production and reduces dependence on imports.
- Helps develop local supply chains and supports SMEs.

Export-Oriented Industrialization

- Encourages export-led growth by providing incentives for exporting industries.
- Offers tax breaks, duty drawbacks, and other benefits to exporters.
- Supports the development of export-oriented industries, such as textiles, leather, and sports goods.
- Encourages diversification of exports to reduce dependence on a few commodities.
- Provides training and support to exporters to improve product quality and marketing skills.

Global Best Practices

China: Industrial Policy China's industrial policy is a comprehensive framework aimed at promoting domestic industries and reducing dependence on imports. The policy includes:

- **Subsidies:** Financial support to domestic companies to encourage production and innovation.
- **Tax incentives:** Reduced tax rates or exemptions for domestic companies, especially in strategic sectors.
- **Government procurement policies:** Preference is given to domestic products in government tenders and contracts. These measures have enabled China to develop its domestic industries, particularly in sectors like technology, renewable energy, and high-speed rail (Jia et al., 2019).

China: Special Economic Zones (SEZs) China's SEZs are designated areas that offer favorable business conditions to attract domestic and foreign investment. The benefits include:

- **Tax incentives:** Reduced or exempted taxes for a specified period.
- **Streamlined regulatory processes:** Simplified and faster procedures for setting up and operating businesses.
- **Infrastructure support:** World-class infrastructure, including transportation, utilities, and telecommunications. SEZs have played a crucial role in China's economic growth, attracting significant foreign investment and promoting export-oriented manufacturing (Crane et al., 2018).

Brazil: Local Content Requirements Brazil's local content requirements mandate that certain industries, such as automotive and oil & gas, use a specified percentage of locally sourced components. This policy aims to:

- Promote domestic manufacturing.
- Encourage technology transfer.
- Reduce import dependence. By requiring local content, Brazil has developed its domestic industries, created jobs, and reduced its trade deficit (d'Almeida et al., 2019).

Brazil: BNDES (Brazilian Development Bank) BNDES is a state-owned development bank that provides long-term financing for projects that enhance local production and reduce import dependency. The bank's support includes:

- **Low-interest loans.**
- **Long-term financing.**
- **Risk mitigation instruments.** BNDES has played a vital role in Brazil's industrial development, supporting strategic sectors like infrastructure, energy, and manufacturing (Rezende & Smith Colleges, 2015).

India: Make in India Initiative The Make in India initiative is a comprehensive program aimed at promoting India as a global manufacturing hub. The initiative offers:

- **Tax benefits:** Reduced tax rates and exemptions for businesses.
- **Infrastructure development:** Upgraded infrastructure, including industrial corridors and smart cities.
- **Ease of doing business reforms:** Simplified regulatory processes and reduced bureaucratic hurdles. The initiative has attracted significant foreign investment, boosted domestic manufacturing, and created jobs (Bishnoi, 2019).

Priority Sectors

- Aerospace and Defense
- Information Technology & Information Technology-enabled Services (IT & ITeS)
- Automotive and Auto Components
- Tourism and Hospitality Services
- Pharmaceuticals and Medical Devices
- Medical Value Travel
- Biotechnology
- Transport and Logistics Services

- Capital Goods
- Accounting and Finance Services
- Textiles and Apparels
- Audio-Visual Services
- Chemicals and Petrochemicals
- Legal Services
- Electronics System Design and Manufacturing (ESDM)
- Communication Services
- Leather & Footwear
- Construction and Related Engineering Services
- Food Processing
- Environmental Services
- Gems and Jewelry
- Financial Services
- Shipping
- Education

New Processes:

"Make in India" acknowledges "ease of doing business" as the most crucial factor in promoting entrepreneurship. Several initiatives have already been implemented to improve the business environment.

New Infrastructure:

The government intends to develop industrial corridors and smart cities, and create world-class infrastructure with state-of-the-art technology and high-speed communication. Innovation and research activities are facilitated by a fast-track registration system and improved infrastructure for intellectual property rights (IPR) registration. Skill requirements for the industry will be identified, and workforce development will be undertaken accordingly.

New Sectors:

Foreign Direct Investment (FDI) has been opened up in defense production, insurance, medical devices, construction, and railway infrastructure in a big way. Similarly, FDI is being allowed in insurance and medical devices.

New Mindset:

In order to collaborate with industry for the economic development of the country, the government shall act as a facilitator and not as a regulator.

Some Major Initiatives Taken:

- **Production-Linked Incentive (PLI) Schemes:** In line with India's vision of self-reliance and the goal of enhancing manufacturing capabilities and exports, an outlay of INR 1.97 lakh crore (over US\$ 26 billion) has been announced in the Union Budget 2021-22 for PLI schemes. These schemes cover 14 key manufacturing sectors and will commence from the fiscal year (FY) 2021-22.
- **PM GatiShakti & National Logistics Policy:** The PM GatiShakti is the first-of-its-kind initiative by the government to develop a multimodal logistics infrastructure for national transformation.
- **Industrialization and Urbanization:** The Government of India is advancing various Industrial Corridor Projects under the National Industrial Corridor Program. This program aims to create greenfield industrial regions/nodes that can rival the world's leading manufacturing and investment destinations. India has approved the development of 11 industrial corridors (32 projects) in four phases.
- **New Design, Innovation, and R&D:** India is home to the world's third-largest tech-driven startup ecosystem, with over 79,100 startups. The "Start-up India" initiative aims to encourage entrepreneurship and drive innovation by establishing an ecosystem that supports the growth of startups.
- **Discount on Tax:** Tax rates were adjusted to support the Make in India initiative. India now boasts some of the lowest tax rates in Asia, enhancing its competitiveness on the global stage.

Practical Steps to Adopt a Similar Model:

- The government should act as a facilitator rather than a regulator.
- Import tax rates should be reduced.
- Technology-driven startups can promote entrepreneurship.
- The focus should not only be on developing new corridors but also on the successful execution of existing projects like CPEC, which is crucial at present.

India: Public Procurement Policy

India's public procurement policy mandates preference for domestically produced goods in government procurement. The policy aims to:

- Promote domestic industries
- Reduce import dependence
- Support local businesses

India: Trade and Development Authority of India (TDAI)

TDAI is a premier trade promotion organization of the Government of India, established in 1998. Its primary objective is to promote India's trade and

economic relations with other countries, particularly in the areas of:

1. **Trade Promotion:** Facilitating Indian businesses to access global markets and promoting Indian products abroad.
2. **Market Research and Intelligence:** Providing market insights and analysis to Indian exporters and investors.
3. **Trade Facilitation:** Simplifying trade procedures and reducing transaction costs.
4. **Capacity Building:** Enhancing the competitiveness of Indian industry through training and capacity-building programs.
5. **Investment Promotion:** Attracting foreign investment into India and promoting Indian investments abroad.

TDAI has a wide range of activities, including:

- Organizing trade fairs, exhibitions, and conferences
- Conducting market research and surveys
- Providing training and capacity-building programs
- Facilitating business delegations and trade missions
- Collaborating with foreign trade promotion agencies and organizations

TDAI has offices in India and abroad, including in key markets such as the USA, Europe, Africa, and Asia. It works closely with Indian industry, government agencies, and foreign trade organizations to promote India's trade and economic interests.

By giving preference to domestic products, India has encouraged domestic manufacturing, created jobs, and reduced its trade deficit.

SWOT Analysis of Pakistan's Institutions Responsible for Export Promotion and Import Substitution

Strengths

- The Ministry of Commerce (MOC) provides strategic direction through the STPF, targeting \$46 billion in exports by 2025 with comprehensive incentives like duty drawbacks, export refinancing schemes, and tax exemptions.
- The Federal Board of Revenue (FBR) implements modern customs procedures, including electronic customs clearance systems, significantly enhancing trade efficiency by reducing clearance times.
- The Trade Development Authority of Pakistan (TDAP) offers market research, trade missions, international exhibitions, and capacity-building programs while collaborating with international trade bodies to enhance the global competitiveness and market access of Pakistani exporters.

- **Regulatory Authority:** The Ministry of Commerce has the authority to implement trade policies, control tariffs, and regulate commerce laws, ensuring stable and predictable business environments. As a regulatory authority, it provides advantages like market oversight, which enables the monitoring and management of market activities to prevent excesses and mitigate risks that could lead to economic instability. Regulatory bodies establish safety and quality standards that businesses must comply with, protecting public health and safety. They ensure compliance through inspections, audits, and penalties, reducing risks associated with unsafe products and practices. Additionally, these frameworks enhance consumer and investor confidence by fostering transparency and accountability, thus strengthening trust in the market. Authorities often provide mechanisms for resolving disputes between businesses and consumers, further boosting confidence.
- **Ability to Promote Fair Competition:** By enforcing standards and regulations, authorities protect consumers from fraudulent, unsafe, or unfair business practices, ensuring a fair marketplace. Regulatory authorities can break up monopolies or prevent their formation by scrutinizing mergers and acquisitions that would reduce competition. They can also prohibit practices such as price-fixing, market allocation, and bid-rigging that unfairly restrict competition.
- **Experienced and Diverse HR:** Staffed with economists, trade experts, and legal advisors who bring extensive experience and expertise.
- **CPEC and Infrastructure Projects:** The China-Pakistan Economic Corridor (CPEC) offers significant infrastructure investments, improving logistics and connectivity. This will enhance transportation networks and energy infrastructure. Additionally, collaboration with Chinese companies in infrastructure development and industrial projects facilitates technology transfer, knowledge sharing, and skill development among Pakistani workers and engineers.
- **Strategic Partnership:** CPEC strengthens Pakistan-China bilateral relations, fostering strategic cooperation and mutual trust, while also enhancing Pakistan's standing in the international arena as a key player in regional development initiatives. The economic benefits derived from CPEC projects contribute to political stability and security in Pakistan, creating a conducive environment for further investment and development. Training programs and educational exchanges associated with CPEC projects enhance the capacity and expertise of Pakistani professionals, fostering innovation and entrepreneurship.
- **Strategic Partnerships:** Pakistan has a strong ability to negotiate and maintain international trade agreements and partnerships. It has maintained active trade agreements with China, the EU, the United States, Middle Eastern countries like the UAE and Qatar, and regional organizations such as the South Asian Free Trade Area (SAFTA) and the South Asian Association for Regional Cooperation (SAARC).

- **Policy Development:** Effective in creating and implementing policies that promote trade as the regulating authority.
- **Data and Analytics:** Access to comprehensive economic data for informed decision-making.

Weaknesses

- **Limited Resources and Budget Allocations:** These restrict TDAP's ability to fully support all exporters, especially smaller enterprises. Additionally, its slower adoption of advanced digital tools and platforms leads to inefficiencies.
- **MOC Challenges:** The Ministry of Commerce faces challenges with inconsistent policy implementation across different regions, leading to disparities and confusion among exporters and manufacturers.
- **Bureaucratic Inefficiencies:**
 - **Complex Procedures:** Despite some simplification, export procedures still involve bureaucratic red tape that can delay processes and increase costs.
 - **Inconsistent Implementation:** Policies and incentives are not always implemented consistently across regions, causing disparities and confusion among exporters and manufacturers.
- **Limited Technological Adoption:**
 - **Digitization Gap:** Compared to global best practices like Singapore's TradeNet, Pakistan's export and import processes lack full digitization, resulting in inefficiencies.
 - **Outdated Infrastructure:** Technological infrastructure supporting trade and industrial operations is not always up to global standards, limiting efficiency and competitiveness.
- **Financial Constraints:**
 - **Limited Access to Finance:** SMEs often face difficulties in accessing adequate financing, hampering their growth and capacity to substitute imports with locally produced goods.
 - **Lack of Dedicated Export Bank:** Unlike South Korea's Export-Import Bank, Pakistan lacks a specialized financial institution to provide robust financial support to exporters.
- **Insufficient Market Diversification:**
 - **Narrow Export Base:** Heavy reliance on a few sectors (e.g., textiles) makes Pakistan vulnerable to global market fluctuations and limits overall export growth potential.
 - **Limited Product Range:** Export products are often not diversified, reducing competitiveness and market reach.

Opportunities

1. **Global Market Expansion:**

- **Emerging Markets:** Opportunities exist to explore and penetrate emerging markets in Africa, Central Asia, and Southeast Asia, diversifying export destinations.
- **Free Trade Agreements (FTAs):** There is potential to negotiate new FTAs or optimize existing ones to enhance market access for Pakistani products.

Technological Advancements:

- **Digitization Initiatives:** Adopting advanced digital systems for trade processes can streamline operations and reduce costs.
 - **Innovation in Manufacturing:** Leveraging new technologies and innovations in manufacturing can enhance productivity and competitiveness.
2. **Investment in SEZs:**
 - **Attracting Foreign Direct Investment (FDI):** Enhanced promotion and development of SEZs can attract significant FDI, boosting local production capabilities.
 - **Public-Private Partnerships (PPPs):** Encouraging PPPs within SEZs can lead to better infrastructure and service provision, supporting industrial growth.
 3. **Capacity Building Programs:**
 - **Enhanced Training:** Expanding training programs for exporters and SMEs can improve quality standards and operational efficiency.
 - **Market Intelligence:** Providing more extensive market intelligence and support can help businesses adapt to changing global demands.

Threats

1. **Global Economic Volatility:**
 - **Market Fluctuations:** Economic downturns and fluctuations in global demand can adversely affect Pakistan's exports, particularly in non-diversified sectors.
 - **Trade Barriers:** Increasing protectionism and trade barriers in key markets can limit export growth.
2. **Regional Instability:**
 - **Political and Security Risks:** Regional political instability and security concerns can deter foreign investment and disrupt trade activities.
 - **Geopolitical Tensions:** Tensions with neighboring countries can impact cross-border trade and economic cooperation.
3. **Competitor Nations:**

- **Competitive Pressure:** Emerging economies with similar export profiles pose significant competition, potentially eroding market share.
 - **Technological Advancement in Competitors:** Competitor nations adopting advanced technologies faster can outpace Pakistan in global markets.
4. **Environmental and Social Challenges:**
- **Sustainability Issues:** Environmental concerns and pressures to adopt sustainable practices can increase operational costs and require substantial adjustments in industrial processes.
 - **Labor Market Constraints:** Issues such as labor unrest and skill shortages can hinder production efficiency and export performance.

PESTLE Analysis

Political:

- **Stability and Policy Consistency:** Political stability is crucial for the implementation of export and import policies. Frequent changes in government and policy direction can disrupt long-term plans.
- **Government Initiatives:** The government has introduced various initiatives like the STPF and SEZ Act, showing a commitment to improving the trade balance.

Economic:

- **GDP Contribution:** The export sector contributes significantly to GDP and employment.
- **Exchange Rates:** Fluctuations in exchange rates impact export competitiveness.
- **Inflation and Interest Rates:** High inflation and interest rates can increase production costs, making exports less competitive.

Social:

- **Employment:** Export industries, especially textiles, provide substantial employment opportunities.
- **Skill Development:** There is a need for improved training and capacity-building to enhance productivity and quality in export-oriented sectors.

Technological:

- **Innovation and Digitalization:** Limited adoption of technology in trade processes. There is a need for digital platforms like Singapore's TradeNet to streamline procedures.

- **Research and Development:** Investment in R&D is low, which impacts product innovation and competitiveness.

Legal:

- **Regulatory Framework:** Export Policy Order (EPO) and Import Policy Order (IPO) provide the legal framework, but bureaucratic hurdles persist.
- **Compliance and Standards:** Ensuring compliance with international standards is critical for market access, which requires a robust legal framework.

Environmental:

- **Sustainability:** Increasing global emphasis on sustainable practices. Export sectors need to adopt environmentally friendly practices.
- **Resource Management:** Efficient use of resources and reducing waste are essential for sustainable growth.

GAP Analysis

Current State vs. Desired State:

Policy and Framework:

- **Current:** Policies like the STPF and SEZ Act are in place, but implementation is inconsistent, and bureaucratic inefficiencies are prevalent.
- **Desired:** Streamlined, transparent, and efficiently implemented policies.

Technological Adoption:

- **Current:** Limited digitization of export processes and outdated infrastructure.
- **Desired:** Full digitization of trade processes, with the adoption of advanced technologies for manufacturing and export documentation.

Financial Support:

- **Current:** Limited access to finance for SMEs and a lack of a dedicated export bank.
- **Desired:** Robust financial support systems, including a dedicated export bank similar to South Korea's Export-Import Bank.

Market Diversification:

- **Current:** Heavy reliance on a few sectors (e.g., textiles).

- **Desired:** Diversified export base, tapping into sectors like IT, agriculture, and services.

Capacity Building:

- **Current:** Limited training and capacity-building programs.
- **Desired:** Extensive and continuous training programs to enhance skills and productivity.

Challenges

1. Pakistan's export sector grapples with multifaceted challenges, as reflected in statistical trends. The country's export concentration index, a measure of market diversification, indicates a high dependence on a few key markets. For instance, the United States, the European Union, and Middle Eastern countries collectively absorb over 60% of Pakistan's total exports, exposing the sector to external shocks and market volatility.
2. Inadequate infrastructure remains a pressing concern, with the World Bank estimating that poor infrastructure reduces Pakistan's GDP by 3% annually.
3. Pakistan faces stiff competition from regional rivals and emerging economies. Bangladesh, India, and Vietnam, with their competitive labor costs and robust trade infrastructure, pose formidable challenges to Pakistan's export competitiveness.
4. Textiles, Pakistan's flagship export sector, faces intense competition from Bangladesh, which surpassed Pakistan to become the world's second-largest apparel exporter in 2019.
5. Despite having a policy framework and institutional support, the country faces several challenges, including bureaucratic inefficiencies, limited technological adoption, financial constraints for SMEs, and insufficient market diversification.
6. Political instability and security concerns are significant challenges to ensuring the smooth functioning of institutions in the country.
7. Inefficient transportation infrastructure, including poor road conditions, inadequate public transportation, and congested traffic, delays the movement of goods. This leads to higher transportation costs, longer delivery times, and reduced reliability.
8. Procedural flaws in institutional frameworks: Procedural flaws in the Ministry of Commerce often stem from a lack of transparency and accountability, leading to inefficiencies and mistrust among stakeholders. Bureaucratic delays, characterized by lengthy and complex approval processes, further hinder effective policy implementation and economic activities.
9. Low productivity and high competition: The global market presence of superpowers makes it difficult for a developing country to establish its place and compete with limited resources.

10. Brain drain of the skilled workforce: Brain drain, the emigration of skilled professionals and educated individuals from Pakistan, has been a significant concern in recent years. This trend is driven by various factors, including limited job opportunities, political instability, and better career prospects abroad, which in the long term can lead to an HR deficiency.
11. Lack of coordination with the diaspora: Insufficient engagement and communication between the government and the diaspora leads to missed opportunities for investment, knowledge transfer, and collaboration. Many expatriates are willing to contribute to Pakistan's development, but the absence of structured programs and incentives discourages their involvement.
12. Underperformance of commercial attaches: Inadequate training and lack of relevant experience contribute to the underperformance of commercial attaches. Additionally, insufficient resources and support from the home government can limit their ability to perform effectively. A lack of clear performance metrics and accountability mechanisms further exacerbates the issue.

Conclusion

Pakistan's export promotion efforts, particularly through the STPF and TDAP, align well with global best practices by focusing on financial incentives, market access, and capacity building. However, Pakistan could benefit from further digitizing and streamlining export processes, similar to Singapore's TradeNet. Additionally, establishing a dedicated export bank, as seen in South Korea, could provide more robust financial support to exporters.

Pakistan's import substitution policies, particularly through the IPO and SEZ Act, provide a strong foundation for reducing import dependency and promoting local production. However, these policies could be enhanced by adopting more aggressive local content requirements, as seen in Brazil, and by providing robust financial support through a dedicated development bank. Additionally, initiatives like India's "Make in India" could serve as a model for creating a more conducive environment for domestic manufacturing through comprehensive reforms and incentives.

Pakistan's export promotion and import substitution strategies hold significant potential for driving economic growth and stability. By addressing these issues through targeted and pragmatic actions, Pakistan can enhance its trade performance and achieve sustainable economic progress. A holistic approach involving policy implementation, technological advancement, financial support, and capacity building is essential to overcome these challenges and leverage the opportunities identified.

Recommendations

1. **A 5-Year National Charter for Exports:** Established and overseen by the Prime Minister to consistently prioritize exports as warranted. This policy should transition the bureaucratic mindset from "control" to "empowerment." A long-term strategy that unifies all stakeholders is necessary to streamline planning and incentivize investment for scalability and enhanced competitiveness.
2. **Exports Need to Be an Integral Part of an Industrial Policy:** There is a need to promote manufacturing, including rational import substitution. An export policy that is not closely linked with manufacturing and imports is not sustainable in the long term. A National Industrial Policy should address all aspects of manufacturing, including exports and import substitution.
3. **Accountability of All Export Incentives:** Export incentives, funded by taxpayers, must be subject to proper accountability. These incentives should be reviewed for each sector at least annually, and their continuation or modification should be based on the achievement of prescribed medium- to long-term objectives. Short-term incentives often result in short-term performance.
4. **An Export Facilitation Scheme (EFS):** The Export Facilitation Scheme should promote integration into global supply chains. The recently implemented scheme needs revision with input from all stakeholders. The current configuration of the scheme does not enable multiple domestic firms working together to be part of the supply chain of exporting firms.
5. **Energy at Competitive Rates for All Export Sectors:** All exports should be entitled to energy at a cost that is globally competitive. This will help broaden the export basket. For industries producing a mix of exported and domestically marketed products, a rebate should be offered on the quantity exported to make the input cost of energy globally competitive.
6. **Competitive Rate of the Pakistani Rupee:** In recent years, Pakistani exporters have lost market share due to an artificially high value of the currency, which has made exports uncompetitive and subsidized imports. The Pakistani Rupee needs to be maintained at a real exchange parity of about 100%.
7. **Invest to Promote the Growth of Exports:** The government needs to take a leap of faith by allocating a significant portion of the Export Development Fund (EDF) for upfront investments in non-core and new markets. Pakistan must heavily invest in diversifying both its products and export destinations.
8. **Wash Exports Clean of All Domestic Taxes and Duties:**
As a fundamental principle, all import duties and domestic transaction costs, regardless of where they are incurred in the supply chain leading up to the final point of export, should be reimbursed to the final exporter. This would enhance price competitiveness.

9. **Promotion of Pakistani Brands in International Markets:** Strong brands can demand higher prices. Pakistani exporters should be permitted to acquire and develop brands that they already own. Acquiring a brand is a capital investment, while developing a brand incurs expenses.
10. **A State-Sponsored National Brand Building Program:** Pakistan could gain valuable insights from the Turkish "TURQUALITY" Program, where the Turkish government has been funding the development of 10 globally recognized Turkish brands. A "PAKQUALITY" initiative should be promoted under the Public-Private Partnership (PPP) model to ensure that Pakistani brands also achieve regional and global recognition.
11. **Time for Realization of Export Proceeds Needs to Be Flexible:** Pakistani exporters must receive export proceeds within a brief timeframe, which prohibits the warehousing of products for subsequent "just-in-time" sales, a practice increasingly demanded by foreign buyers. To address this, larger exporters should be allowed to warehouse inventory abroad. This is particularly important for serving online sales portals like Amazon, which require prompt domestic shipping for foreign suppliers to gain access. However, this could result in longer times for remittance of export proceeds.
12. **Financing for SMEs:** Implementing a vendor financing and export house model could enhance the integration of SMEs into the export chain. Japan and Korea successfully developed their exports using the export house model, with companies like Mitsubishi and Mitsui providing a valuable model and learning opportunity.
13. **FDI Should Be Export-Focused:** Pakistan has struggled to attract foreign investment in exports, even in sectors like agriculture with significant potential. A differentiated Foreign Direct Investment (FDI) policy, which can positively impact the external account, is recommended to attract new foreign investment. Additionally, existing foreign companies operating in Pakistan should be encouraged to integrate into their global value chains by exporting from Pakistan.
14. **Increase Value-Addition in Current Export Basket:** The bulk of Pakistan's exports are cotton-based, while global demand is shifting to fabricated fibers, which are also ideal for emerging technical textiles. There is significant scope to change the cotton/man-made fiber mix and to move up the value chain.
15. **Incentivize Export of Services:** Unlike the export of goods, which attracts rebates, the export of services is not similarly incentivized. Rebates would also encourage the full remittance of sale proceeds. IT and IT-enabled service companies lack immovable collateral for bank borrowing. Their work-in-progress and receivables should form the basis of bank lending. Call centers are charged GST even on export services, which should be withdrawn. Equipment required for developing software and operating call centers and back-office services should be permitted to be imported duty-free.

16. Moratorium on Signing New Trade Agreements: Pakistan's trade agreements have resulted in an increase in imports without significant improvements in exports. Trade agreements should be based on economic considerations rather than solely on political or emotional ties, both at the national and individual levels.

17. Adoption of Alternative Energy Sources like Electric Vehicles, Solar, and Wind Power: Substitution of energy sources can reduce the operational cost of exports.

LOG Frame Work Matrix:

Objective 1: Enhance Policy Implementation and Coordination

Action	Responsibilities	Resources	Timelines	Indicators	Means of Verification
Reduce processing times for official reports and export documentation by 50% within two years.	Federal Government/Relevant Ministries (e.g., Ministry of Commerce)	PSDP funds / Donor funds	2 years	Reduction in average processing time	Reports from relevant ministries, Third-party surveys of businesses
Create a central coordination unit within Pakistan.	Relevant Ministry (e.g., Ministry of IT & Telecom)	PSDP funds / Donor funds	1 year	Establishment of the unit, Functional website/office of the unit	Government gazettes, Unit website/office functionality reports
Develop and implement a comprehensive digital platform for official reports and export documentation.	Relevant Ministry (e.g., Ministry of IT & Telecom)	PSDP funds / Donor funds	8 Months	Platform development milestones achieved, User registration numbers	Project progress reports, Platform usage statistics

Objective 2: Adopt Technological Solutions:

Action	Responsibilities	Resources	Timelines	Indicators	Means of Verification
Secure funding for National Trade Portal	Ministry of Finance	Budget allocation	1 year	Funding secured; Funding amount	Public announcement; Funding agreement
Develop National Trade Portal plan	MOC	Consultants; Technical experts	1 year	Plan finalized	Public document

Award contract for National Trade Portal development	MOC	Bidding process; Selection committee	4 Month	Contract awarded	Public announcement; Contract documents
Implement National Trade Portal	Contractor	Technical resources	Year 2	Portal operational (beta version)	Press release; Portal beta launch
Upgrade technological infrastructure	Ministry of Information Technology (MoIT)	Budget allocation	Year 1, Q2- Year 3	Infrastructure upgrades completed	Progress reports; Technical documentation
Launch National Trade Portal	MOC	Marketing campaign	Year 2, Q4	Portal launched	Press release; Public announcement
Monitor and improve National Trade Portal	MOC	User feedback; Data on portal usage	Ongoing	Increased portal usage	User surveys; Portal usage statistics

Objective 3: Strengthen Financial Support for SMEs

Action	Responsibilities	Resources	Timelines	Indicators	Means of Verification
Secure funding for EDB	Ministry of Finance (MoF), SBP	Budget allocation; International aid (e.g., Islamic Development Bank)	Year 1-2	Funding secured in principle; Funding amount secured	Public announcement; Funding agreement framework
Develop EDB business plan	MoF, SBP, Financial experts	Consultants; Market research data specific to Pakistan	Year 2	Business Plan finalized with detailed implementation roadmap	Public document
Establish legal framework for EDB	Ministry of Law	Legal team; Regulatory expertise, Islamic banking principles	Year 2-3	Enabling legislation drafted and submitted for approval	Legal document progress reports
Recruit and train EDB staff	EDB board	Budget allocation; Human resources team with focus on Islamic finance	Year 3-4	Core EDB team recruited and trained	Hiring records; Training reports on core competencies
Launch EDB operations in Pakistan	EDB management team	Bank infrastructure; Financial products tailored to Pakistani SMEs	Year 4	Limited EDB operations launched (e.g., pilot programs)	Press release; EDB website with initial product offerings
Full-scale EDB operations	EDB management team	Continued funding; Expansion of product range	Year 5+	Full range of EDB services available	Public announcement; EDB website reflecting full product suite

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Tapping Mineral, Oil, and Gas Resources for Economic Development

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Abstract:

Pakistan is endowed with significant mineral, oil, and gas resources, with the potential to substantially contribute to the country's economic development. However, the nation faces several pressing challenges in effectively harnessing these resources, including declining reserves and production, inefficient exploration and production activities, suboptimal resource management and distribution, regulatory and policy complexities, and environmental and social concerns. This study provides a comprehensive analysis of the key factors and challenges influencing the development of Pakistan's extractive industries, including its mineral, oil, and gas resources. It assesses the scale of the country's resource potential, evaluates the policy and regulatory framework, examines the institutional capacity and governance structures, analyzes the investment climate and financing mechanisms, appraises the technological capabilities and infrastructure, investigates the environmental and social impacts, and evaluates the overall economic contributions and diversification potential of the extractive sectors.

Key words:

Mineral Resources, Oil and Gas, Resource Management, Regulatory Challenges, Economic Development.

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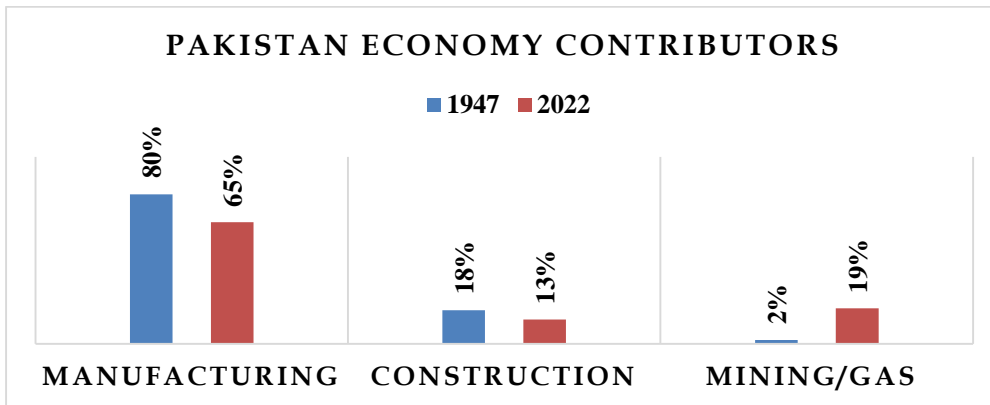
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Introduction

After independence, the manufacturing sector dominated the economy of Pakistan, accounting for 80% of the total, while construction/mining and electricity/oil/gas generation and distribution accounted for 18% and 2%, respectively. However, by 2022, the share of manufacturing had decreased to 65%, while construction, oil/electricity/gas generation and distribution had increased to 13%, and mining had grown to 9% (Kulrashid, 2022).

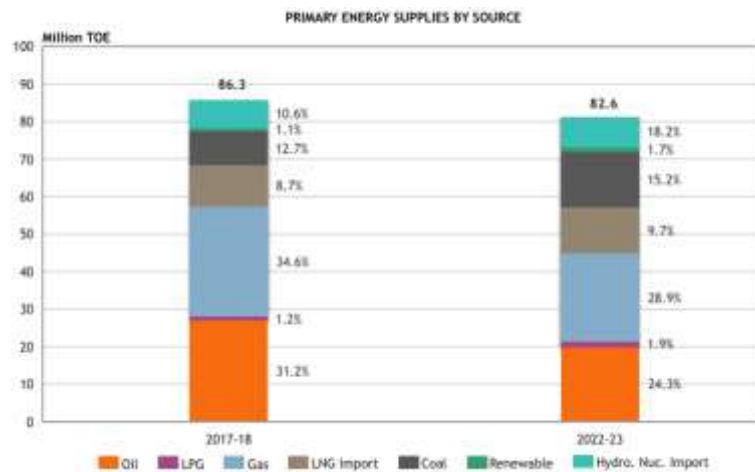


Surveys have identified that Pakistan has a total mineralized area of 600,000 square kilometers. In total, the country has discovered 92 different minerals, and mining companies are currently extracting 52 of these on a small scale through over 5,000 active mines (Naqeeb, Pheng, Ullah, & Mumtaz, 2024). Some of the key mineral resources found in Pakistan include:

- Coal: Estimated 185 billion tons
- Copper: Estimated 7,000 million tons
- Gold: Estimated 1,658 million tons
- Salt: Estimated 10 billion tons
- Silver: Estimated 620 million tons
- Lead and zinc: Estimated 24 million tons
- Manganese: Estimated 1.597 million tons
- Chromite: Estimated 3 million tons
- Iron ore: Estimated 1,450 million tons

Pakistan is recognized globally for having the 5th largest copper-gold reserves, the 2nd largest coal reserves, and the 2nd largest salt reserves in the world. However, the country has not been able to fully harness these mineral resources to drive economic development, with the mining sector currently contributing only around 2.7% to GDP (Naqeeb, Pheng, Ullah, & Mumtaz, 2024).

Pakistan's sedimentary basins are indeed promising areas for oil and gas exploration. Pakistan's oil production is 72,000 BPD, and consumption is 435,000 BPD. Estimates suggest significant potential, ranging from at least 300 million barrels of recoverable oil to 20 trillion cubic feet of natural gas, and potentially even higher figures (Year Book, 2022-23). Pakistan is a net importer of refined oil because its domestic refining capacity is limited. The country produces about 4.3 million metric tons of crude oil per year, which only meets 20% of its total petroleum needs. The remaining 80% is imported as crude oil and refined products, costing \$15-\$16 billion annually (ITA, 2021). Natural gas makes up 38% of Pakistan's total energy supply. Natural gas production in Pakistan is 3,200 MMCFD, and consumption is 4,100 MMCFD. Domestic gas production is around 4 billion cubic feet per day, but demand is 6-8 billion cubic feet per day, leading to a supply shortfall. Pakistan's gas production has been declining in recent years (ITA, 2021).



Source: Pakistan Energy Yearbook 2022-23

Statement of the Problem

There is no denying the fact that Pakistan is endowed with significant mineral, oil, and gas resources, which have the potential to contribute substantially to the country's economic development. However, the nation faces several pressing challenges in effectively harnessing these resources. Declining reserves and production, inefficient exploration and production activities, suboptimal resource management and distribution, regulatory and policy complexities, and environmental and social concerns have all hindered the effective utilization of these valuable resources. Therefore, addressing these multifaceted challenges through a comprehensive and coherent strategy is crucial for Pakistan to unlock the full potential of its mineral, oil, and gas resources and leverage them for sustainable economic growth and energy security through pertinent and pragmatic recommendations.

Scope of the Study

This study will take a comprehensive approach to analyzing the key factors and challenges influencing the development of Pakistan's extractive industries, including its mineral, oil, and gas resources. It will assess the scale of the country's resource potential, evaluate the policy and regulatory framework, examine the institutional capacity and governance structures, analyze the investment climate and financing mechanisms, appraise the technological capabilities and infrastructure, investigate the environmental and social impacts, and evaluate the overall economic contributions and diversification potential of the extractive sectors.

Literature Review

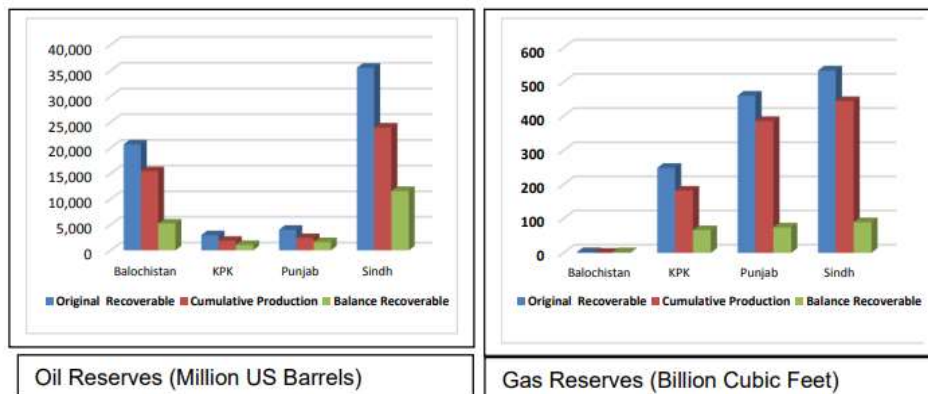
A qualitative approach was adopted for research on this topic. The task involved extracting specific information from secondary sources, such as analysis of reports, literature reviews, related rules/policies, and examining various brief and annual reports obtained from relevant stakeholder departments and oil & gas exploratory companies. The subsequent situational, comparative, and SWOT analyses further elaborated the requirements for pertinent and pragmatic recommendations.

1. Situational Analysis of Mineral & Oil & Gas Sectors

HIDDEN TREASURES	
Total mineralized area 600,000 square kilometers.	
Discovered Minerals 92	
Mining companies 52	
No. of Active Mines 5,000	
Key Mineral Resources (Estimated)	
<ul style="list-style-type: none"> Total mineralized area 600,000 square kilometers. Discovered Minerals 92 Mining companies 52 No. of Active Mines 5,000 	<ul style="list-style-type: none"> Silver: 620 million tons Lead and zinc: 24 million tons Manganese: 1.597 million tons Chromite: 3 million tons Iron ore: 1,450 million tons

Pakistan is undertaking a multi-pronged approach to enhance its road, rail, pipeline, port, and power infrastructure to unlock the economic potential of its extractive industries. This includes expanding and upgrading road networks to better connect resource-rich regions like Balochistan to major cities and ports, developing transportation projects under the China-Pakistan Economic Corridor, expanding and modernizing rail infrastructure, constructing new oil and gas pipelines, increasing storage and terminal capacities at ports, building new power generation and grid infrastructure to ensure a reliable electricity supply, and establishing specialized industrial parks and special economic zones near resource-rich areas to attract investment in downstream processing industries. These coordinated infrastructure development efforts aim to improve logistics, reduce transportation costs, enhance distribution, and create an enabling environment for the growth of Pakistan's mineral, oil, and gas sectors (ME&P, 2020).

Oil & Gas Reserves of Pakistan



Source: Ministry of Energy, 2024

Pakistan's mineral, oil, and gas sectors are benefiting from advancements in areas such as advanced seismic imaging, digital oilfield solutions, enhanced oil recovery techniques, robotics and automation, and renewable energy integration. New 3D seismic imaging powered by AI is enabling more precise subsurface mapping to reduce exploration risks, while the integration of sensors, IoT, and data analytics is driving operational efficiencies, safety, and remote monitoring across the industry. Innovative Enhanced Oil Recovery (EOR) methods are extending the life of mature fields and increasing overall yield. Robotic and autonomous technologies are lowering costs and safety risks. Furthermore, oil and gas companies are adopting hybrid energy systems combining conventional and renewable sources to lower emissions and generate new revenue streams. These transformative technologies are expected to significantly boost Pakistan's ability to unlock and optimize the value of its natural resources in the coming years.

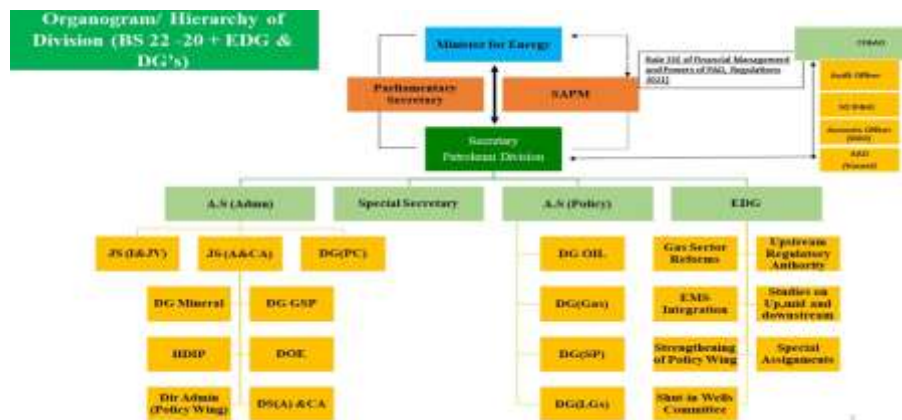
The provincial governments in Pakistan collect royalties from the extraction of minerals, oil, and gas, which are intended to provide financial benefits to the local communities affected by these activities. However, the distribution of these royalties has been uneven, and the actual impact on local development has been a source of contention. The extractive industries also have the potential to create direct and indirect employment opportunities for the local populations, and the development of supporting infrastructure, such as roads and power supplies, can also benefit the communities. Some extractive companies have established community development funds to support social, educational, and infrastructure projects, but the effective management and utilization of these funds to address the needs of the communities is crucial.

Before any extraction activities can commence, robust environmental impact assessments (EIAs) are conducted to identify and mitigate potential risks to water resources, air quality, biodiversity, and local communities. Effective water management strategies, including water recycling and conservation, are crucial to minimize the impact on local water supplies, while implementing best practices for air pollution control, such as the use of emission control technologies and regular monitoring, is essential to protect local air quality. The extraction and processing of resources also generate various types of waste, including hazardous waste, which must be properly handled and disposed of to prevent environmental contamination. Furthermore, extractive activities can lead to habitat destruction, fragmentation, and the displacement of wildlife, particularly in areas with sensitive or protected ecosystems, necessitating measures to preserve and restore biodiversity.

2. Regulatory & Institutional Analysis of Mineral & Oil & Gas Sectors

The legal and institutional analysis of the oil, gas, and minerals sector in Pakistan is crucial for ensuring the effective management and sustainable development of these sectors. It provides a framework for the formulation and implementation of policies, regulations, and laws that govern the exploration, production, and distribution of these resources. This analysis helps identify and address the challenges and issues faced by the sector, such as inadequate infrastructure, limited exploration, and regulatory barriers. It also ensures that the sector is governed in a way that balances federal and provincial interests, addresses environmental and social concerns, and contributes to the overall economic growth of the country. Furthermore, it helps create a favorable business environment, simplifies regulations, and improves infrastructure, which are essential for attracting investment and enhancing domestic production.

The Constitution of Pakistan provides a legal framework to govern the ownership, exploration, and development of the country's mineral, oil, and gas resources through articles like 154, 158, 161, and 172. The petroleum and mining sectors are primarily regulated through the Petroleum Exploration and Production Policy 2012 and the Mines and Minerals Development Act 1948, respectively, with provincial governments having jurisdiction over resources within their boundaries. Exploration and production activities are carried out through production sharing contracts and mineral licenses awarded by the relevant authorities, which specify terms like exploration periods, development plans, revenue sharing, and environmental compliance. Key regulatory bodies include the Ministry of Petroleum and Natural Resources, the Geological Survey of Pakistan, Provincial Mineral Development Corporations, and OGRA, which is a downstream body tasked with fixing prices of oil and gas. Environmental Protection Agencies work to balance the economic benefits with environmental and social considerations in the extractive industries.



Source: Ministry of Petroleum, 2024

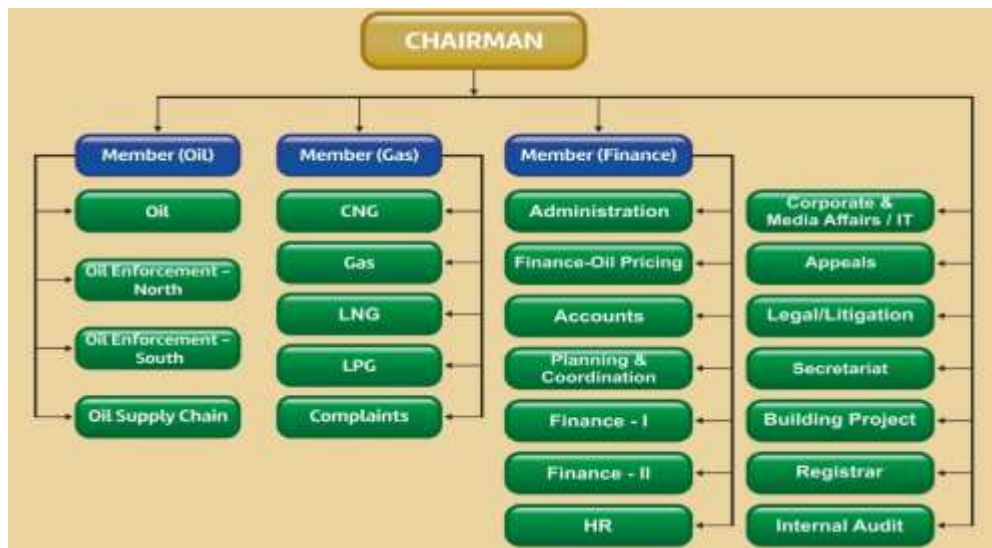
Oil & Gas Regulatory Authority (OGRA)

The Oil & Gas Regulatory Authority (OGRA) is the primary regulator of Pakistan's midstream and downstream oil and gas industry. It is responsible for formulating and fostering an effective regulatory framework to ensure the efficient and safe operation of the sector. OGRA's primary objectives include regulating the marketing and distribution of oil and gas products, ensuring compliance with technical standards, and handling complaints related to the sector.

OGRA's regulatory powers are derived from the OGRA Ordinance 2002 and the Pakistan Petroleum (Refining, Blending, and Marketing) Rules 1971, which were replaced by the Pakistan Oil (Refining, Blending, Transportation, Storage & Marketing) Rules 2016. The Authority is responsible for granting licenses to oil marketing companies, oil refineries, oil pipelines, oil storage facilities, and lubricant marketing companies, as well as for monitoring and enforcing compliance with these licenses.

OGRA's activities include coordinating with various government departments and agencies to ensure effective regulation of the sector. It also provides training to its employees and participates in international seminars and workshops to stay updated on best practices in the field. The Authority publishes regular reports on the state of the regulated petroleum industry and provides information on oil and gas prices, which are updated regularly.

Organogram of Oil & Gas Regulatory Authority (OGRA)



Source: OGRA, 2024

3. Comparative Analysis & Best Practices

The oil, gas, and mineral sectors in Pakistan and the United States differ significantly in scale, technological advancement, and economic impact. The U.S. boasts vast reserves and production capabilities, with proven oil reserves of around 44.2 billion barrels and natural gas reserves exceeding 450 trillion cubic feet (TCF), supported by advanced technologies such as hydraulic fracturing and horizontal drilling. This makes the U.S. a leading global producer and exporter of these resources. In contrast, Pakistan's oil reserves are modest at about 561 million barrels, and its natural gas reserves stand at approximately 19 TCF. Pakistan faces significant challenges, including outdated infrastructure, regulatory hurdles, and security concerns, which limit the full exploitation of its resources. While the U.S. mining sector is a significant contributor to its economy with advanced technologies and robust regulatory frameworks, Pakistan's mineral sector, despite having substantial deposits like those in Thar and Reko Diq, remains underdeveloped due to similar issues of infrastructure and investment.

The comparison of the Reko Diq copper-gold project in Balochistan, Pakistan, and the Pebble copper-gold project in Alaska, USA – two significant mining ventures – is used as a case study for analysis. Reko Diq, a joint venture between the Government of Balochistan and Barrick Gold, boasts a porphyry copper-gold deposit with estimated reserves of 5.9 billion tons of ore and 41.5 million ounces of gold. In contrast, Pebble, owned by Northern Dynasty Minerals, is a world-class porphyry deposit with substantial reserves of copper, gold, and molybdenum, estimated at 70.6 million tons of recoverable copper and 107.4 million ounces of gold. Both projects face unique challenges, including regulatory and legal hurdles, environmental concerns, and community resistance, which are compared in this study to highlight the differences in their approaches to these issues.

	Reko-Diq-Pakistan	Northern Dynasty Minerals -Pebble - US
Location and Geology	Location: Balochistan, Pakistan Geology: Porphyry copper-gold deposit with an estimated 5.9 billion tons of ore. Ownership: Joint venture between the Government of Balochistan and Barrick Gold	Location: Alaska, USA Geology: World-class porphyry deposit with substantial copper, gold, and molybdenum reserves. Ownership: Northern Dynasty Minerals
Economic Impact	Significant copper and gold reserves (41.5 million ounces of gold).	Estimated 70.6 million tons of recoverable copper, 107.4 million ounces of gold.
Regulatory and Legal Stability	Faces significant legal and regulatory uncertainty, including past disputes and changes in mining laws.	Operates within a more stable and predictable legal framework, despite facing stringent regulatory challenges.
Environmental Management	Limited engagement with local communities, leading to conflicts and resistance.	Has detailed environmental impact assessments and mitigation plans, although it faces strong opposition.
Community Engagement	Limited engagement with local communities, leading to conflicts and resistance.	More structured engagement with stakeholders, though still controversial.
Technological Advancement	Slower adoption of advanced mining technologies and best practices.	Higher integration of cutting-edge mining and environmental technologies.
Investment and Funding	Struggles with securing consistent funding and investment due to political and legal risks	More access to funding from established financial markets, despite environmental concerns.

4. SWOT Analysis

Oil Gas Regulatory Authority (OGRA)

"OGRA" stands for the Oil and Gas Regulatory Authority. It is a regulatory body in Pakistan responsible for overseeing and regulating the activities related to the oil and gas sector in the country. OGRA ensures compliance

with laws, rules, and regulations governing the exploration, production, refining, distribution, and marketing of oil and gas products. It plays a crucial role in ensuring fair competition, consumer protection, and the overall development of the oil and gas industry in Pakistan.

Strengths

1. **Regulatory Oversight:** Independent regulatory body overseeing the oil and gas sector, ensuring impartial decision-making and regulatory enforcement.
2. **Policy Formulation:** Involved in policy formulation and advises the government on matters related to the oil and gas industry, contributing to the development of the sector.
3. **Consumer Protection:** Works to protect consumer interests by regulating prices, ensuring quality standards, and promoting fair competition among companies.
4. **Licensing and Compliance:** Issues licenses and ensures compliance with regulations for entities involved in exploration, production, refining, distribution, and marketing.
5. **Technical Expertise:** Employs professionals with expertise in technical aspects, allowing for informed decision-making and effective regulation.
6. **Transparency:** Maintains transparency in its operations, decisions, and regulatory processes, fostering accountability and public trust.

Weaknesses

1. **Resource Constraints:** Faces limitations in terms of financial resources, staffing, and technical capabilities, which could hinder its ability to regulate the complex and dynamic oil and gas industry.
2. **Political Interference:** Like many regulatory bodies, OGRA might be susceptible to political pressure or influence, which could compromise its independence and impartiality in decision-making.
3. **Enforcement Challenges:** May encounter difficulties in enforcing regulations due to the vast geographic spread of oil and gas infrastructure, as well as illegal activities in the sector.
4. **Capacity Building:** Capacity-building efforts may be necessary in technological advancements and regulatory frameworks.
5. **Stakeholder Engagement:** Ensuring engagement with stakeholders, including industry players, government agencies, and civil society, could be challenging and may require enhanced communication and collaboration mechanisms.
6. **Regulatory Gaps:** May face challenges in keeping pace with rapid changes, leading to potential gaps in regulations or outdated policies that do not adequately address emerging issues.

Opportunities

1. **Policy Advocacy:** OGRA can advocate for policy reforms to promote investment, innovation, and sustainability. This could include advocating for renewable energy integration and supporting cleaner fuel standards.
2. **Technology Integration:** Embracing technological advancements such as digitalization, data analytics, and remote monitoring can enhance capabilities. This includes utilizing technologies for compliance verification and risk assessment.
3. **Diversification:** Explore opportunities to diversify its regulatory scope beyond traditional activities. This might involve regulating emerging sectors such as liquefied natural gas (LNG), renewable energy, and alternative fuels relevant in the energy transition.
4. **Capacity Building:** Investing in staff training and development programs can enhance proficiency in areas such as environmental impact assessments, safety management systems, and regulatory compliance auditing.
5. **International Collaboration:** Collaborating with international regulatory bodies and industry associations can facilitate knowledge exchange, align its regulatory standards with global best practices, and enhance the competitiveness of Pakistan's oil and gas sector.
6. **Public Engagement:** Strengthening public engagement and awareness initiatives can foster trust. This includes enhancing communication channels, conducting public consultations on regulatory decisions, and promoting consumer education on energy-related issues.

Threats

1. **Political Interference:** OGRA faces threats from political interference. Political pressures to manipulate prices, regulations, or licensing decisions may compromise its ability to enforce fair and transparent practices.
2. **Security Concerns:** The oil and gas infrastructure may be vulnerable to security threats such as sabotage, terrorism, or geopolitical tensions. These threats can disrupt operations, damage infrastructure, and pose risks to personnel safety.
3. **Economic Instability:** Economic instability, including currency devaluation, inflation, and fiscal deficits, can impact investment levels and project viability. Reduced investment may lead to supply shortages, price volatility, and regulatory challenges.
4. **Market Volatility:** Fluctuations in global oil prices and market demand create challenges in regulating price levels, managing supply chains, and ensuring energy security. Market volatility also impacts revenue streams for the government, affecting funding and operational capabilities.
5. **Environmental Risks:** Increasing awareness of environmental issues and climate change concerns pose regulatory challenges in ensuring

sustainable practices and compliance with environmental standards. Failure to address environmental risks could lead to public backlash, legal liabilities, and regulatory scrutiny.

6. **Technological Disruptions:** Rapid technological advancements, such as renewable energy integration, electric vehicles, and decentralized energy systems, pose challenges in adapting regulatory frameworks. Failure to embrace technological changes could result in regulatory gaps and market disruptions.

Ministry of Energy, Petroleum Division

The Ministry of Energy (Petroleum Division) in Pakistan is responsible for overseeing the country's oil, gas, and mineral sectors. It aims to ensure the availability and security of sustainable energy supplies to support economic development and meet the strategic requirements of the nation. The ministry has adopted an integrated approach to promote exploration, attract private investment, develop technical expertise, and optimize existing energy infrastructure. It oversees various attached departments, autonomous bodies, corporations, and companies that collectively work towards achieving the mission of catering to the energy needs of the people of Pakistan. Below is a SWOT analysis of the Ministry of Energy, Petroleum Division.

Strengths

1. **Policy and Regulation Framework:**
 - Existence of comprehensive energy policies and regulations aimed at improving the efficiency and sustainability of the energy sector.
2. **Government Support:**
 - Strong governmental backing and prioritization of the energy sector in national development plans.
3. **Resource Availability:**
 - **Natural Gas Reserves:** Pakistan has proven natural gas reserves of approximately 19 trillion cubic feet (Tcf) as of recent estimates.
 - **Oil Reserves:** Proven oil reserves stand at around 505 million barrels.
4. **Strategic Location:**
 - Pakistan is strategically located near major oil-producing countries and along key maritime trade routes, facilitating energy imports and exports.
5. **Human Capital:**
 - The country has a pool of skilled professionals in the petroleum sector, with several universities and institutions offering specialized degrees in petroleum engineering and energy management.

Weaknesses

1. **Infrastructure Deficiencies:**
 - **Pipeline Network:** Pakistan's pipeline infrastructure is inadequate and aging, with frequent reports of pipeline leaks and accidents.
 - **Refining Capacity:** The country's refining capacity is around 417,400 barrels per day (bpd), which is insufficient to meet domestic demand.
2. **Dependency on Imports:**
 - **Import Dependency:** Pakistan imports about 70% of its oil needs, making it vulnerable to global oil price fluctuations. In 2022, the import bill for petroleum products exceeded USD 17 billion.
3. **Regulatory and Bureaucratic Hurdles:**
 - Complex and slow regulatory processes can delay project approvals and deter investors. The Ease of Doing Business ranking for Pakistan remains a challenge, impacting investor confidence.
4. **Financial Constraints:**
 - Budgetary constraints and rising fiscal deficits limit the government's ability to invest in energy infrastructure. For example, the fiscal deficit for FY 2023 was around 6.9% of GDP.
5. **Energy Theft and Losses:**
 - Energy theft and losses in transmission and distribution are significant, with estimated losses around 20-30% in the gas sector alone.

Opportunities

1. **Exploration and Production:**
 - There are vast unexplored areas, particularly in offshore regions, with potential for significant oil and gas discoveries. Recent offshore exploration initiatives show promising prospects.
2. **Renewable Energy Integration:**
 - The government aims to increase the share of renewable energy to 30% of the total energy mix by 2030. Investment in solar, wind, and hydropower projects is on the rise.
3. **Technological Advancements:**
 - Adoption of modern extraction technologies such as hydraulic fracturing and horizontal drilling can boost domestic production. The introduction of digital technologies in monitoring and managing energy systems is also an area of growth.
4. **Foreign Investments:**
 - Initiatives like the China-Pakistan Economic Corridor (CPEC) include significant investments in the energy sector, with projects like the Gwadar LNG terminal and various power plants.

5. Regional Energy Cooperation:

- Projects like the TAPI (Turkmenistan-Afghanistan-Pakistan-India) pipeline and the CASA-1000 (Central Asia-South Asia) electricity transmission project offer opportunities for regional cooperation and energy security.

Threats

1. Political Instability:

- Political instability and security issues in the region can disrupt energy supply chains and deter investments.

2. Environmental Concerns:

- Increasing environmental regulations and concerns over fossil fuel emissions are leading to stricter compliance requirements and potential penalties.

3. Competition from Alternatives:

- Growing competition from alternative energy sources, such as renewables and electric vehicles, is reducing demand for traditional petroleum products.

4. Global Energy Market Volatility:

- Fluctuations in global oil prices can severely impact the economy, as seen during the oil price crash in 2020 and the subsequent surge in 2022.

5. Environmental Concerns:

- Increasing global and domestic pressure to reduce carbon emissions could lead to stricter regulations and higher costs for compliance. Pakistan's commitments under the Paris Agreement necessitate a shift toward greener energy sources.

6. Competition from Alternatives:

- The global shift towards renewable energy and electric vehicles could reduce long-term demand for petroleum products. Countries are investing heavily in renewable technologies, which could outcompete traditional fossil fuels.

Pakistan Mineral Development Corporation (PMDC)

The Pakistan Mineral Development Corporation (PMDC) is a semi-autonomous corporation under the Ministry of Petroleum and Natural Resources, Government of Pakistan. Established in 1974, PMDC operates autonomously, with the primary objective of expanding and promoting mineral development activities in the country.

Strengths

1. **Government Support:** State-owned corporation, ensuring government support and backing for its operations and projects.
2. **Experience and Expertise:** PMDC has extensive experience in the mineral sector, particularly in exploration, development, and production.
3. **Infrastructure and Facilities:** The corporation has a network of offices, laboratories, and other facilities across Pakistan, providing a solid foundation for its operations.
4. **Access to Capital:** As a state-owned entity, PMDC has access to government funding and capital, which can be leveraged for new projects and investments.
5. **Strategic Partnerships:** PMDC can form strategic partnerships with other state-owned and private companies to enhance its capabilities and expand its reach.

Weaknesses

1. **Limited Resources:** PMDC's resources are limited, which hinders its ability to invest in new projects and expand its operations.
2. **Dependence on Government Funding:** The corporation's operations are heavily reliant on government funding, which can be unpredictable and subject to budget constraints.
3. **Limited Expertise in Certain Areas:** Despite its extensive experience in oil and gas exploration, it may lack expertise in other areas of the mineral sector, such as mining and metallurgy.
4. **Inefficient Operations:** PMDC's operations may be inefficient due to outdated infrastructure and lack of modern technology, which can impact its productivity and competitiveness.

Opportunities

1. **Unconventional Resources:** Pakistan has significant untapped unconventional oil and gas resources, which can be explored to increase the country's energy security.
2. **Mineral Sector Growth:** The mineral sector has significant growth potential, driven by increasing demand for minerals and metals globally.
3. **International Cooperation:** Collaboration with international companies and organizations to access new technologies, expertise, and markets will enhance its capabilities and competitiveness.
4. **Government Support for Diversification:** The government is promoting diversification of the economy, which can lead to increased investment in the mineral sector and new opportunities.

Threats

1. **Energy Crisis:** Pakistan faces a severe energy crisis, which can impact the demand for oil and gas and the overall performance of PMDC.
2. **Global Economic Uncertainty:** Global economic uncertainty can impact the demand for minerals and metals, affecting PMDC's operations and profitability.
3. **Competition from Private Companies:** Private and international companies can compete with PMDC for projects and resources, potentially impacting its market share and profitability.
4. **Environmental and Social Concerns:** Environmental and social concerns can lead to increased regulatory scrutiny and public opposition, impacting PMDC's operations and reputation.

5. GAP ANALYSIS OF THE MINERAL, OIL & GAS SECTORS

The gap analysis of the oil, gas, and mineral sectors of Pakistan reveals critical insights into the current state, desired state, and identified gaps within the sector. Currently, exploration and production activities in Pakistan are operating below their potential, coupled with challenges in resource management and regulatory complexities that impede efficient utilization and investment. The desired state aims to enhance exploration and production efforts, improve resource management practices, and streamline the regulatory framework to attract investment and optimize resource utilization. The identified gaps underscore the need to address limited exploration and production activities, inefficiencies in resource management, and regulatory complexities to bridge the existing disparities and propel the sector toward sustainable growth and development.

Current State

- **Limited Exploration and Production:** Exploration and production activities are below their potential.
- **Inefficient Resource Management:** Challenges in distribution and management hinder efficient utilization.
- **Regulatory Complexities:** Inefficient and misaligned regulatory frameworks deter investment.

Desired State

- **Increased Exploration and Production:** Enhance exploration activities to tap into untapped resources.
- **Efficient Resource Management:** Improve distribution and management practices for optimal utilization.

- **Streamlined Regulatory Framework:** Enhance regulatory efficiency and transparency to attract investment.

Gap

- **Exploration and Production:** Limited activities compared to potential resource reserves.
- **Resource Management:** Inefficiencies in distribution and utilization hinder optimal resource utilization.
- **Regulatory Framework:** Complexities and uncertainties deter investment and efficient resource management.

CHALLENGES

1. **Insufficient Exploration and Mapping of Resources:** The country's geological surveys and assessments of mineral, oil, and gas reserves are often outdated or incomplete, leading to uncertainties about the true potential of these resources. Lack of comprehensive data and information hinders effective resource planning and policy-making.

2. **Inadequate Infrastructure and Logistics:** Inadequate transportation networks, power supply, and water management systems in resource-rich areas impede the development of extraction and processing facilities. The absence of integrated infrastructure linking production sites to consumption centers and export markets reduces the overall competitiveness of the sector.

3. **Limited Access to Technology and Financing:** Domestic companies, especially small and medium-sized enterprises, lack access to advanced technologies, processing techniques, and management expertise required for efficient resource extraction and value addition. Difficulties in securing affordable financing from domestic and international sources constrain the industry's ability to invest in modernization and expansion.

4. **Regulatory Uncertainty and Institutional Weaknesses:**

Inconsistent or unclear policies, lengthy approval processes, and overlapping jurisdictions of various government agencies create regulatory uncertainties for investors. Inadequate institutional capacity, coordination, and enforcement of existing laws and regulations undermine the effective governance of the extractive industries.

5. **Environmental and Social Concerns:**

Lack of stringent environmental regulations and weak enforcement mechanisms lead to concerns about the environmental and social impact of resource extraction activities. Unresolved issues related to land rights, community displacement, and the equitable distribution of benefits from resource exploitation can fuel social tensions and conflicts.

6. Skilled Labor Shortages and Brain Drain:

The country faces a shortage of skilled professionals, technicians, and researchers required for the operation and maintenance of advanced extraction and processing facilities. Lack of adequate training and career development opportunities, as well as competition from better-paying jobs abroad, result in the brain drain of talented individuals from the extractive industries.

7. Limited Domestic Demand and Export Competitiveness:

The relatively small size of the domestic market and limited purchasing power of the population constrain the growth of local demand for value-added products from the extractive industries. Pakistani manufacturers often struggle to match the price and quality of imported mineral-based materials, chemicals, and refined petroleum products, hampering their export competitiveness.

8. Major Shortcomings

Short Comings	Area of Improvement
<p>Mineral Sector</p> <p>1. Outdated Legislation: The Mines Act 1923 and the Regulation of Mines and Oilfields and Mineral Development (Government Control) Act 1948 are outdated and may not fully address modern mining practices and environmental concerns.</p> <p>2. Lack of Comprehensive Environmental Regulation: The Pakistan Environmental Protection Ordinance 1997 is general and not tailored specifically to the mining sector, which needs more stringent and specific environmental regulations.</p> <p>3. Fragmented Institutional Framework: The responsibilities are spread across multiple organizations (Ministry of Industry & Production, Geological Survey of Pakistan, Pakistan Mineral Development Corporation, Provincial Mineral Development Corporations), leading to potential overlaps and inefficiencies.</p>	<p>1. Modernize Legislation: Update the Mines Act 1923 and other relevant laws to include modern mining practices, technology, and stringent environmental standards.</p> <p>2. Enhance Environmental Regulations: Develop specific environmental regulations for the mining sector, ensuring sustainable mining practices and minimizing environmental degradation.</p> <p>3. Streamline Institutional Framework: Consolidate and clarify the roles of various institutions to reduce overlaps and improve coordination. Establish a single-window operation for licensing and regulatory approvals.</p> <p>4. Invest in Technology and Training Increase funding for institutions like GSP and PMDC to adopt modern geological survey techniques and</p>

<p>4. Limited Technological Advancement: Institutions like the Geological Survey of Pakistan (GSP) and Pakistan Mineral Development Corporation (PMDC) are often underfunded and lack modern technological tools and expertise</p>	<p>mining technologies. Conduct regular training programs for personnel.</p>
<p><u>Oil & Gas Sector</u></p> <p>1. Complex Regulatory Environment: Multiple regulations (e.g., Pakistan Petroleum (Production) Rules 1949, Pakistan Petroleum (Exploration & Production) Rules 1986, 2001, 2009, 2013, etc.) create a complex legal environment that can deter investment due to bureaucratic delays.</p> <p>2. Inconsistent Policy Implementation: Inconsistent application and frequent changes in policies like the Petroleum Exploration and Production Policy 2012 can create uncertainty for investors.</p> <p>3. Regulatory Overlap: Overlapping roles of the Ministry of Energy (Petroleum Division) and the Oil and Gas Regulatory Authority (OGRA) can lead to inefficiencies and delays in decision-making.</p> <p>4. Insufficient Data Management: Lack of a centralized and updated database for exploration and production activities hinders effective monitoring and planning.</p>	<p>1. Simplify Regulatory Framework: Streamline and consolidate various regulations into a single comprehensive legal framework to reduce complexity and improve clarity for investors.</p> <p>2. Ensure Policy Consistency: Implement consistent and stable policies to provide a predictable investment environment. Establish mechanisms for regular review and feedback to adapt policies without frequent overhauls.</p> <p>3. Improve Coordination between Institutions: Clearly delineate the responsibilities of the Ministry of Energy and OGRA to avoid overlaps. Enhance inter-agency communication and coordination mechanisms.</p> <p>4. Develop Centralized Data Management System: Invest in creating a centralized database for oil and gas exploration and production data. This will improve transparency, monitoring, and decision-making processes.</p>

Conclusion

The study on tapping Pakistan's oil, mineral, and gas sectors for economic growth highlights the significant potential of these sectors in contributing to the country's economic development. The study emphasizes the need to address the challenges faced by these sectors, including inadequate infrastructure, limited exploration activities, and regulatory barriers. The conclusion underscores the importance of strategic planning and policy reforms to unlock the full potential of these sectors. It suggests that the government should focus on creating a favorable business environment by simplifying regulatory processes, improving infrastructure, and providing incentives for foreign investment. Additionally, the study recommends enhancing domestic production and reducing import dependency through the development of local refining capacities and exploration of new oil and gas reserves. The study concludes that Pakistan's mineral, oil, and gas sectors have significant potential to contribute to the country's economic growth, but they require strategic planning and policy reforms to overcome the challenges they face.

Recommendations

S#	Recommendation	Action By	Timeline
1	Infrastructure Upgrades: <ul style="list-style-type: none"> • Accelerate the expansion and modernization of road, rail, pipeline, and port infrastructure to improve connectivity between resource-rich regions and economic hubs, as well as enhance transportation and distribution capabilities. • Prioritize the timely completion of the China-Pakistan Economic Corridor (CPEC) projects related to energy, transportation, and logistics to unlock synergies. • Invest in building new power generation capacity, transmission networks, and grid infrastructure to ensure reliable electricity supply to support energy-intensive extractive industries. 	Ministry of Planning Division	Immediate
2	Regulatory Reforms: <ul style="list-style-type: none"> • Review and update the Petroleum Exploration and Production Policy, as well as provincial mining policies, to provide a clear, stable, and investor-friendly regulatory framework. 	Parliament of Pakistan, Ministry of Energy (Petroleum Division)	Medium Term

	<ul style="list-style-type: none"> • Streamline licensing and approval processes for exploration, development, and production activities to reduce administrative delays. • Strengthen coordination between Federal and provincial authorities to ensure coherent policymaking and effective implementation. • Enhance environmental regulations and enforcement to mitigate the impact of extractive operations. 		
3	<p>Technology Adoption:</p> <ul style="list-style-type: none"> • Actively promote the adoption of advanced technologies like 3D seismic imaging, digital oilfield solutions, enhanced oil recovery techniques, and robotics/automation among local operators. • Collaborate with international technology providers and research institutions to facilitate knowledge transfer and build local capabilities. • Incentivize investments in renewable energy integration and emissions-reduction technologies to support the sustainability of the extractive sectors. 	Ministry of Energy with help of ICT Department and Energy & Power Department	Long Term
4	<p>Capacity Building:</p> <ul style="list-style-type: none"> • Invest in developing a skilled workforce through technical and vocational training programs tailored to the extractive industries. • Establish centers of excellence and research institutions to foster innovation and technological progress in the sector. • Encourage public-private partnerships and international collaborations to bring in global best practices and expertise. 	Ministry of Energy	Medium Term
5	<p>Re-structuring of Organizations</p> <ul style="list-style-type: none"> • Organization of DGPC with considerable n meaningful influence of the provinces in decision making, especially after the 18th Amendment. • An Up stream regulatory authority by the name of Pakistan Mines, Mineral and Petroleum Upstream Regulatory Authority is the need of the hour 	Federal Govt	Long Term

Log Frame Matrix

Goal	Indicators	Sources of Verification	Assumptions
Enhance the contribution of mineral, oil, and gas sectors to Pakistan's economic development.	Increased GDP contribution from the extractive industries Growth in infrastructure projects completion Number of new investments and technological adoptions in the sectors Number of skilled workers trained Fulfillments of corporate sectors responsibilities	National economic reports Ministry of Planning Division reports Investment records Training institution records Progress review meetings and reports Monitoring inspection and reports	Political stability Continued government support Effective policy implementation Sustained development and prosperity Involvement and ownership of the locals Conducive security situation

Outcomes	Indicators	Sources of Verification	Assumptions
1. Improved infrastructure	Number of infrastructure projects completed Enhanced connectivity between regions	- Project completion reports Transport and logistics records	- Sufficient funding Timely project execution
2. Streamlined regulatory environment	- Updated and clear regulatory policies Reduced administrative delays Enhanced coordination between authorities	- Government policy documents Licensing and approval records Inter-departmental communication records	- Stakeholder cooperation Effective policy review
3. Adoption of advanced technologies	- Number of new technologies adopted Collaborations with international technology providers Investments in renewable energy integration	- Technology adoption records Collaboration agreements Investment reports	- Availability of technology Willingness to invest
4. Developed skilled workforce	- Number of technical and vocational training programs Establishment of centers of excellence Public-private partnerships in training initiatives	- Training program records Establishment documents Partnership agreements	- Interest from potential trainees Support from private sector

Outcome .1:- Infrastructure Development

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Expand and upgrade road networks	Ministry of Energy, Ministry of Planning Division	Funding for infrastructure projects, technical expertise	Immediate	Improved connectivity between resource-rich regions and economic hubs
Develop China-Pakistan Economic Corridor (CPEC) transportation projects	Ministry of Energy, Ministry of Planning Division	Funding for CPEC projects, technical expertise	Immediate	Enhanced synergies between energy, transportation, and logistics sectors
Expand and modernize rail infrastructure	Ministry of Energy, Ministry of Planning Division	Funding for infrastructure projects, technical expertise	Immediate	Improved transportation capabilities
Construct new oil and gas pipelines	Ministry of Energy, Ministry of Planning Division	Funding for infrastructure projects, technical expertise	Immediate	Enhanced distribution capabilities
Increase storage and terminal capacities at ports	Ministry of Energy, Ministry of Planning Division	Funding for infrastructure projects, technical expertise	Immediate	Improved logistics and distribution
Build new power generation and grid infrastructure	Ministry of Energy, Ministry of Planning Division	Funding for infrastructure projects, technical expertise	Immediate	Reliable electricity supply to support energy-intensive extractive industries

Out-come .2:- Stream line Regulatory Environment

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Review and update the Petroleum Exploration and Production Policy and provincial mining policies	Ministry of Energy, Ministry of Planning Division	Funding for policy development, technical expertise	Immediate	Clear, stable, and investor-friendly regulatory framework
Streamline licensing and approval processes for exploration, development, and production activities	Ministry of Energy, Ministry of Planning Division	Funding for regulatory development, technical expertise	Immediate	Reduced administrative delays
Strengthen coordination between federal and provincial authorities	Ministry of Energy, Provincial Governments	Funding for coordination, technical expertise	Immediate	Coherent policymaking and effective implementation

Out-come 2.1: - Re-structuring of Organizations

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Re-organize DGPC with meaningful provincial influence	Ministry of Energy, Provincial Governments	Funding for organizational restructuring, technical expertise	Long-term	Effective decision-making and coordination
Establish Pakistan Mines, Mineral and Petroleum Upstream Regulatory Authority	Ministry of Energy, Ministry of Planning Division	Funding for regulatory development, technical expertise	Long-term	Effective regulation of upstream activities

Consolidate and clarify the roles of various institutions to reduce overlaps and improve coordination	Ministry of Energy, Ministry of Planning Division	Funding for institutional consolidation, technical expertise	Immediate	Improved coordination between institutions, reduced bureaucratic delays
Establish a single-window operation for licensing and regulatory approvals	Ministry of Energy, Ministry of Planning Division	Funding for single-window operation, technical expertise	Immediate	Simplified regulatory processes, reduced administrative delays

Out-come.3:- Technology and Innovation

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Adopt advanced seismic imaging and digital oilfield solutions	Extractive companies	Funding for technology adoption, technical expertise	Immediate	Improved exploration and production efficiency
Implement enhanced oil recovery techniques	Extractive companies	Funding for technology adoption, technical expertise	Immediate	Increased oil recovery rates
Integrate renewable energy sources	Extractive companies	Funding for technology adoption, technical expertise	Immediate	Reduced emissions and increased energy security

Out-come 4: - Capacity Building and Training

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Invest in developing a skilled workforce through technical and vocational training programs	Ministry of Energy, Ministry of Planning Division	Funding for training programs, technical expertise	Immediate	Skilled workforce in extractive industries
Establish centers of excellence and research institutions	Ministry of Energy, Ministry of Planning Division	Funding for centers of excellence, technical expertise	Immediate	Innovation and technological progress in extractive sectors

Out-come 4.1: - Community Engagement and Development

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Establish community development funds	Extractive companies	Funding for community development , technical expertise	Immediate	Effective management and utilization of community development funds
Implement robust environmental impact assessments and mitigation measures	Extractive companies	Funding for environmental assessments, technical expertise	Immediate	Minimized environmental and social impacts

Out-come 4.2: - Environmental and Social Concerns

Proposed Action	Responsibilities	Resources	Timeline	Key Performance Indicators
Conduct robust environmental impact assessments	Extractive companies	Funding for environmental assessments, technical expertise	Immediate	Minimized environmental impacts
Implement best practices for air pollution control	Extractive companies	Funding for air pollution control, technical expertise	Immediate	Protected local air quality
Implement effective water management strategies	Extractive companies	Funding for water management, technical expertise	Immediate	Minimized impact on local water supplies
Implement measures to preserve and restore biodiversity	Extractive companies	Funding for biodiversity preservation, technical expertise	Immediate	Preserved local ecosystems

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