# Critical Evaluation of Evacuation Drives and Related Security Issues during the Recent Floods

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## Abstract:

*The 2022 floods in Khyber Pakhtunkhwa (KP), Pakistan, resulted in widespread devastation, affecting approximately 33 million people, with significant loss of life and property. Despite the coordinated efforts of the Provincial Disaster Management Authority (PDMA), Rescue 1122, and local police, evacuation and rescue operations faced critical challenges, including poor planning, inadequate early warning systems, and resource limitations. These deficiencies contributed to 311 deaths and 381 injuries in KP. The study highlights the lack of proactive preparedness and the unequal distribution of resources among districts, which exacerbated the crisis. Moreover, security concerns during evacuation, resistance from affected populations, and gaps in governance were significant obstacles. This paper recommends both short-term measures, such as improved early warning systems and resource allocation, and long-term solutions, including merging disaster response agencies and establishing dedicated storage facilities for relief items.*

***Key words:*** *Floods, Evacuation, Disaster Management, Early Warning Systems, Khyber Pakhtunkhwa*

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## *Introduction*

From June to August 2022, torrential rains and a combination of riverine, urban, and flash flooding led to an unprecedented disaster in Pakistan. According to the National Disaster Management Authority (NDMA), around 33 million people, or one in seven, have been affected by the floods, including nearly 8 million displaced. The floods have claimed the lives of more than 1,700 people, one-third of whom were children (MOPD&SI, 2022).

Disaster management in KP has organized structures in the form of PDMA, Rescue 1122, and the Police. In emergency cases, the authorities concerned evacuate the population from damaged or vulnerable areas and transfer them to more secure locations to temporarily shelter them until all restoration has been completed. However, evacuation and rescue processes may vary depending on the place, time, nature, type, and magnitude of the disasters, as well as the degree of danger to life and property. To ensure the success of these two processes, there must be full cooperation between the population and the authorities concerned.

Historically, evacuation has been the conventional approach to flood safety. However, evidence presented in this paper suggests that safe evacuation or movement in flood-hit areas has also encountered numerous obstacles. These can be characterized by poor planning, weak early warning systems, capacity issues, lack of preparedness, security-related concerns, and, above all, resistance from people to leave their belongings. Despite these challenges, the concerned departments made every effort to secure human lives and minimize losses. For those who were stranded in flood-hit areas, rescue operations were carried out with the collaborative efforts of Rescue 1122, PDMA, and District Administration.

## *Statement of the Problem*

Evacuation during disasters like floods is of paramount importance for safeguarding human lives and property. However, in developing countries like Pakistan, many precious lives and properties are lost during floods. Therefore, it becomes imperative to critically examine the evacuation efforts and related security issues, particularly during the recent floods of 2022 in KP, and to provide recommendations for effective rescue and evacuation operations in the future.

## *Scope of the Research*

This study aims to analyze the existing policy framework regarding the evacuation drive, particularly during the 2022 floods in KP in general, and in flood-hit districts in particular (Charsada, D.I. Khan, Nowshera, Swat, and Tank). It will evaluate the mandate, capacity, preparedness, and the role played by the Police, Rescue 1122, and the District Administration during the evacuation drive. The study will also analyze international best practices regarding flood evacuation. After applying analytical tools, a way forward will be proposed to improve the management of rescue and evacuation activities during floods.

## *Literature Review*

Recent flash floods in Pakistan were due to climate change, and such floods are expected to become much more frequent in the future. The floods generate economic, environmental, and social effects that need to be mitigated by addressing the floods and preparing methodologies for the evacuation of people and movable property from affected areas. The evacuation planning for floods aims to minimize fatalities and material losses. Crucially, this type of planning requires a well-defined, optimal evacuation policy for people and households within flood hazard areas. In addition, evacuation modeling is particularly important for authorities, planners, and other experts managing the evacuation process, as it allows for the relocation of evacuees to safe zones (Stefańska, 2022).

Evacuations are always costly for communities, and that cost should be included in a balanced flood risk management assessment. Additionally, it is necessary to roughly calculate the duration of the evacuation operation, which may be estimated by considering the time needed to warn the population in the area, the time required to move vehicles along the road, a firm prediction of flood intensity, the time needed to mobilize resources, and the time a community will take to comprehend and respond to the warning. The estimated time for each of these activities in the evacuation operation can be determined by experience, test exercises, or sampling (Stephen, 2010).

In the context of previous earthquake and flood disasters in Pakistan, the federal government established the National Disaster Management Authority under the NDMA Act of 2010. Subsequently, as per the provisions of the NDMA Act, the provincial governments established Provincial Disaster Management Authorities under their respective PDMA Acts with the objective of countering disasters (NDMA, 2010).

## *Research Methodology*

For this study, qualitative research methods have been used, relying on both primary and secondary data. For primary data collection, personal interviews with government officials were conducted. An online evacuation and security survey was conducted with 39 affectees (Annex-A), and another survey on security-related issues was completed by 97 affectees (Annex-B). Moreover, a survey on capacity and preparedness was carried out with 23 government officers from PDMA, Rescue 1122, and District Administration Departments (Annex-C). Secondary data was collected through internet sources. However, no data could be acquired from the Police, as they have not maintained any data on rescue and evacuation activities.

## *Organization of the Report*

This study is divided into four sections. The introduction is followed by the statement of the problem, scope of the research, review of literature, and research methodology. Section I explains the situational analysis and identifies legal and institutional provisions and policy gaps that hamper the capacity and preparedness of the stakeholders. Section II critically examines the performance of various institutions during the 2022 floods. Section III outlines some of the world's best practices and lessons learned. Section IV analyzes the results of surveys conducted online, followed by the conclusion and recommendations.

## *Critical Analysis*

In KP province, seventeen (17) districts were calamity hit during recent floods, around 4350490 populations was directly affected, having 306 human losses including Male-149, Female-41 and Children-116, 369 injuries were reported (Male-156, Female-79, and Children-134), 21328 livestock losses and 91463 HHs damages, in which 37525 HHs were Fully-damaged (FD) and 53938 HHs were Partially damaged (PD). Moreover, 1,575 KM of road infrastructure has been inundated, 107 bridges collapsed in the floods (Isl22).

## *Legal Analysis*

### Critical Analysis of NDMA Act, 2010

The National Disaster Management Act, 2010 provides legal foundation to all disaster management activities. Main sections of the NDMA Act relevant to preparedness, rescue and evacuation are highlighted and critically evaluated as under:

| Relevant Section | Description | Critical Analysis |
|---|---|---|
| 16 (2) (e) | Evaluate preparedness at all governmental or non-governmental levels to respond to disaster and to enhance preparedness. | ✓ No periodic evaluation of preparedness of departments<br>✓ No evaluation of lessons learnt |
| 16 (2)(h) | Promote general education, awareness and community training for disaster management | ✓ No public awareness campaigns regarding disaster mitigation are carried out at governmental level<br>✓ Mock exercise was carried out only at Nowshera, Otherwise no community training is imparted at all. |
| 16 (2)(k) | Examine the construction in the area and if it is of the opinion that the standards laid down have not been followed, it may direct for following the same to secure compliance of such standards | ✓ Weak regulatory mechanism in place.<br>✓ The concerned govt organs like TMA, LGs don't take cognizance of illegal buildings, construction in the vulnerable areas.<br>✓ Wash away of Honey Moon Hotel in Kalam is a glaring example of violation of this provision. |
| 17(2) | The Provincial governments are bound to prepare Provincial Disaster Management Plans | ✓ Contingency plans are prepared in black and white at provincial and district levels. However, these plans are not implemented in true letter and spirit.<br>✓ There is no third party validation to check whether the guidelines of contingency plans were followed or not. |
| 17 (3)(a-f) | States regarding, deification of vulnerabilities, preventive measures, capacity building and preparedness of departments | ✓ For all practical purposes no preventive measures are taken in advance of monsoon floods. For instance, every district contingency plan provides for clearance and encroachment removal from all major drains and nullahs in the district. However, drains and nullahs are not at all cleared before monsoon. |

| | | |
|---|---|---|
| | | ✓ Encroachments are not removed timely from rivers, canal banks.<br>✓ Although NIDM is mandated to provide capacity building trainings on disaster management at district level. However, it was revealed during this research activity that not even a single training was received by any of the officer of district administration/Rescue 1122/Police for disaster management. |
| 17 (4) | The provincial plans shall be reviewed and updated annually. | ✓ It is followed. |
| 18 (1) | Each Provincial Government shall, as soon as may be after issue of notification under sub section 1 of section 13, by notification in the official gazette, establish a District Disaster Management Authority for every District | ✓ This provision of NDMA Act provides for establishment of District Disaster Management Authority for every district. Whereas, the PDMA has set up only make shift/ad-hoc arrangement in the form of DDMUs and additional charge is given to ACs, under the administrative control of DC. Moreover, no financial autonomy has been provided to DDMUs. |
| 18(2) | Composition of DDMA Committee was elaborated | ✓ Since no DDMA has been established so far, therefore this provision has not been fulfilled at all. |
| 20 (2)(k) | Set up, maintain, review and upgrade the mechanism for early warnings and dissemination of proper information to public. | ✓ Existing telemetries are not sufficient to effectively and accurately generate alerts for flood emergency. |
| 20 (2)(p) | Establish stock piles of relief and rescue material or ensure preparedness to make such materials available at the short notice. | ✓ Standardized warehouses are not established at provincial/district levels.<br>✓ Centralized purchasing of relief material at provincial level hinders the effective preparedness at district level.<br>✓ Districts can only buy relief material once emergency is declared. |

## PDMA Rules of Business 2013:

The Rules of Business of PDMA 2013 are framed in pursuance of NDMA Act 2010. A critical analysis astonishingly revealed that;

i. PDMA- ROB are silent on the vital areas of rescue and evacuation.
ii. No Provincial Act is framed yet for PDMA and relief department of KP. PDMA and all the allied DDMUs are functioning under PDMA-ROB.
iii. The Rule 9 (2) (h) states the role of Office of Media and Public Relations, however, it is less focused on awareness to masses regarding the disaster management.
iv. Rule 10 (1)(i) states decision of provincial authority is mandatory regarding expenditures out of provincial disaster management fund and other resources of provincial authority. However, the efficiency and effectiveness of any rescue operation is highly hampered because of this provision in the ROB.

The Rule 9 (2)(c) pertains to relief, operations and coordination wing. Major responsibilities of this wing are as follows;

i. Provincial emergency operation center and early warning
ii. Warehouse and frequently stockpiling needed emergency relief goods
iii. Identification of frequently needed relief items
iv. Coordination with national authorities, line departments and NGOs
v. Preparation of plans (provincial plans and contingency plans)
vi. Coordination and provision of relief to disaster affecters
vii. Camp management

### *Critical Analysis of the KP-Rules of Business of PDMA, 2013*

| NDMA Act 2010 | ROB-PDMA 2013 |
|---|---|
| Section-18 (1) states,<br><br>" Each Provincial Government **shall**, **as soon as** may be after issue of notification under sub-section (1) of section (13), by notification in the Official Gazette, **establish a District Disaster Management Authority** for **every** District" | Rule (3) states,<br><br>"The Provincial Authority **may**, where government **so directs**, establish **Divisional** and **District** offices at such places **as may be required**. |

## *Institutional Analysis*

ToR (a) Carry out situational analysis, capacity and preparedness of Police, Rescue 1122 and district administration for evacuation and emergency security issues in situations like recent floods in KP

ToR (b) Carry out critical analysis of the role played by Police, Rescue 1122 and district administration in providing security to the people and protecting their properties in floods hit areas in KP.

### Mandate, Preparedness and Role Played by District Administration

**Mandate**

- Preparation of contingency plans in consultation with all stakeholders with the assistance of DDMU
- Announcement and dissemination of flood alerts
- Coordination with all stakeholders regarding operational activities during emergency
- Establishment of emergency control room
- Supervision of rescue operations and evacuation of the flood affecters
- Provision of financial and other support to Resuce-1122
- Identification of suitable sites, establishment and management of relief camps
- Provision of relief items (FI and NFI) at camp sites
- Ensure security of relief camps

**Capacity & Preparedness of District Administration**

| Relief Items | Tents | Blankets | Mattress | Quilts | Search lights | Mosquito Nets | De-watering Pumps |
|---|---|---|---|---|---|---|---|
| All Districts | 6968 | 10401 | 3463 | 9397 | 641 | 8691 | 20 |

Source: Moonsoon Contingency Plan Report of KP, 2022

**Position of Relief Items in flood hit Districts in KP**

| Districts | Tents | Blankets | Mattress | Quilts | Search Lights | Mosquito Nets | De-watering Pumps |
|---|---|---|---|---|---|---|---|
| Nowshera | 98 | 97 | 80 | 0 | 0 | 0 | 0 |
| Charsada | 822 | 24 | 0 | 0 | 60 | 400 | 0 |
| Swat | 400 | 0 | 400 | 500 | 0 | 400 | 0 |
| D.I. Khan | 435 | 947 | 474 | 0 | 60 | 2060 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tank | 140 | 90 | 88 | 0 | 0 | 250 | 0 |

Source: Moonsoon Contingency Plan Report of KP, 2022

***Financial Preparedness-Funds Position***

PDMA had placed requisite funds at the disposal of all DCs for untoward emergency during the monsoon season. The total available fund with the districts was Rs. 392.69 Million. Breakup of funds is given below;

**Position of Relief Fund in flood hit Districts of KP**

| Districts | Available Funds (Rs Million) |
|---|---|
| Nowshera | 0.125 |
| Charsada | 2.97 |
| Swat | 26.99 |
| D.I. Khan | 19.96 |
| Tank | 19.40 |

Source: Moonsoon Contingency Plan Report of KP, 2022

***Role Played by District Administration during Floods***:

**Rescue and evacuation Activities in KP**

| Activity | Numbers |
|---|---|
| No. of people rescued | 69775 |
| No. of people evacuated | 406538 |
| No. of people displaced | 674318 |
| No. of deaths | 311 |
| No. of people injured | 381 |

Source: PMRU-KP Database

**Rescue and evacuation Activities in flood hit Districts of KP**

| Districts | No. of people rescued | No. of people evacuated | No. of people displaced | No. of people injured | Total deaths |
|---|---|---|---|---|---|
| Nowshera | 20925 | 67917 | 62678 | 0 | 0 |
| Charsada | 21300 | 183000 | 183000 | 21 | 1 |
| Swat | 2481 | 14000 | 3220 | 28 | 34 |
| D.I. Khan | 13500 | 40000 | 180000 | 85 | 41 |
| Tank | 1300 | 5000 | 200000 | | 4 |

Source: PMRU-KP Database

**Establishment of relief camps in flood hit Districts of KP**

| Districts | No. of Relief Camps |
|---|---|
| Nowshehra | 77 |
| Charsadda | 32 |
| Swat | 10 |
| D.I. Khan | 14 |
| Tank | 02 |

Source: Concerned DC Offices

### *Evacuation of Tourists*

3000 tourists were evacuated from Kalam through heli and 27 sorties were conducted.

## *Mandate, Preparedness and Role Played by Rescue-1122*

### *Mandate*

Rescue-1122 provides emergency services in the following areas

i. Pre-hospital medical services
ii. Fire- fighting services
iii. Search and rescue services
iv. Water borne search and rescue

### *Capacity & Preparedness of Rescue-1122*

**Capacity of Rescue 1122 at Provincial Level-KP**

| Equipment | Total |
|---|---|
| Fiber Rescue boats | 52 |
| OBM 75 HP, OBM 40 HP | 51 |
| Water rescue Van | 13 |
| Life Jackets | 972 |
| De-watering pumps | 32 |
| SCUBA Sets | 53 |
| Life Rings | 441 |
| OBM Machine | 24 |
| Inflatable boats | 72 |

| | |
|---|---|
| Swimming suits | 138 |
| Search Lights | 196 |
| Rescue Vehicles | 18 |
| Recovery Vehicles | 11 |
| Rescue Ambulances | 172 |
| Health Ambulances | 329 |
| Generators | 54 |
| Water Bowser | 41 |
| Masting Tower | 16 |
| Excavators | 9 |
| Dumper | 5 |

Source: Rescue-1122 Headquarters

**Capacity of Rescue 1122 at flood hit Districts of KP**

| Equipment | Charsada | Swat | Nowshera | D.I. Khan | Tank |
|---|---|---|---|---|---|
| Fiber Rescue boats | 5 | 3 | 5 | 4 | 0 |
| OBM 75 HP, OBM 40 HP | 5 | 4 | 4 | 5 | 0 |
| Water rescue Van | 1 | 2 | 2 | 1 | 0 |
| Life Jackets | 100 | 100 | 12 | 24 | 6 |
| De-watering pumps | 1 | 1 | 2 | 0 | 0 |
| SCUBA Sets | 3 | 4 | 4 | 4 | 1 |
| Life Rings | 20 | 50 | 50 | 4 | 4 |
| OBM Machine | 2 | 4 | 2 | 1 | 0 |
| Inflatable boats | 3 | 5 | 5 | 4 | 1 |
| Swimming suits | 50 | 15 | 10 | 2 | 0 |
| Search Lights | 20 | 10 | 10 | 0 | 0 |
| Rescue Vehicles | 1 | 1 | 1 | 1 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| Recovery Vehicles | 0 | 1 | 0 | 1 | 0 |
| Rescue Ambulances | 1 | 16 | 8 | 9 | 4 |
| Generators | 3 | 6 | 4 | 1 | 1 |
| Water Bowser | 5 | 3 | 3 | 2 | 0 |
| Masting Tower | 1 | 1 | 1 | 1 | 0 |
| Excavators | 1 | 1 | 0 | 0 | 0 |
| Dumper | 1 | 0 | 0 | 0 | 0 |

Source: Rescue-1122 Headquarters

***Role Played by Rescue-1122 during Floods***

**People rescued & de-watering activities at Provincial Level**

| Activity | Numbers |
|---|---|
| No. of people rescued | 2125 |
| De watering of Houses | 569 |
| De- watering of Markets | 69 |
| De-Watering of Bazars | 198 |

Source: Rescue-1122 Headquarters

**People rescued & de-watering activities at flood hit Districts of KP**

| Districts | No. of people rescued | De- watering | | |
|---|---|---|---|---|
| | | Houses | Markets | Shops |
| Nowshera | 32 | 15 | 5 | 2 |
| Charsada | 128 | 45 | 8 | 3 |
| Swat | 636 | 22 | 03 | 29 |
| D.I. Khan | 320 | 65 | 12 | 57 |
| Tank | 120 | 50 | 2 | 20 |

Source: Rescue-1122 Headquarters

## Mandate, Preparedness, and Role Played by Police

### Mandate

- To enhance the effectiveness and timely response to emergencies by adopting result-oriented strategies and coordinating with all stakeholders, especially DDMUs, ensuring timely liaison.
- To inform the inhabitants of flood-affected areas through local police via wireless communication, mobile phones, alarm systems, police mobile patrols, and announcements in mosques.
- To adopt precautionary measures for the protection of affected people, particularly regarding evacuation.
- To ensure the security of relief camps.
- To provide security to NGOs/INGOs in their respective areas during the rehabilitation process.

### Capacity & Preparedness of Police

Being a disciplined professional organization, the police were well-equipped and prepared for disaster management during the floods. The police department carried out all the tasks and responsibilities assigned to them by the district administration. The police had sufficient machinery and vehicles at their disposal, such as motor transports, vans, buses, and forklifts, which were used for evacuation purposes during the floods. Good coordination with the district administration, local knowledge, and the professionalism of the police department played an instrumental role in managing the flood evacuation process.

### Role Played by Police during Floods

- Maintained law and order and alerted police personnel for rescue services.
- Shifted the rescued/affected people to hospitals.
- Provided easy access to rescue and relief personnel/vehicles.
- Diverted traffic to alternate routes and prohibited overloaded vehicles.
- Ensured the security of NGO and INGO staff.
- Deployed a separate strength of police for the evacuation process.
- Provided appropriate security to relief camps.
- Assisted during immediate rescue, relief, and evacuation operations.

# Best Practices in the World

## People's Republic of China

During flood emergencies, the Flood Control and Drought Relief Headquarters (FCDHs) take command of flood operations, flood emergency response, and post-flood recovery (Kobayashi, 2012). FCDH is very effective in planning and implementing flood control structural works and developing flood forecasting. The effective flood response is based on:
(a) Effective coordination among all agencies involved in emergency response activities, coordinated by the Ministry of Emergency, which dictates the success of any emergency response operation, guaranteeing minimum overlap of roles and responsibilities and maximum effective utilization of available resources. A focal agency is deployed as the principal coordinating body.
(b) Effective logistics management, which is critical in any disaster situation, helps quickly identify the resources needed, such as the response team, equipment, and commodities, and mobilize and transport people to the right place at the right time. Two major elements to make this happen are:

- **Time assessment and deployment list:** A prioritized list of the most critical resource requirements developed in advance of an event.
- **Movement coordination:** Acquiring transportation services and coordinating the flow of resources in and around the flooded area using the prioritized list; continuously reporting on the movement of all transported resources into, within, and out of the flood area; monitoring the flood's effect on transportation systems and resolving route or destination issues. The level of responsiveness of the community: The more aware the community is of the risks and actions to be taken, the more effective and significant the impact of the emergency response will be.

## United States of America

The Federal Emergency Management Agency (FEMA), working under the U.S. Department of Homeland Security, is responsible for programs that take action before and after a disaster to identify risks and reduce injuries, loss of property, and recovery time (FEMA, 2022).

Key activities in flood emergency response are:

**Flood monitoring**

enables up-to-the-minute flood information at the local level, equipping rescue teams with the tools for efficient execution of real-time emergency operations.

**Forecasting and early warning dissemination**

generates warning messages that are appropriate and easily understood by the community and the officials performing response activities. These messages are formulated from the real-time situation.

**Evacuation operations:**

Time is a crucial factor during the evacuation of people to safe areas. Local authorities evacuate areas based on the early warning and latest flood situation. Priority and special care are given to evacuating people who depend on others for mobility due to physical, economic, or social/cultural reasons, such as the elderly, handicapped, and children.

**Safe Area and Temporary Shelter Management:**

To offer safe areas to flood-affected individuals, prior identification of high-ground areas is regarded as one of the most important activities. Local disaster management authorities manage the transportation of tents, tarpaulins, mobile houses, food, and drinking water to safe areas.

**Search and Rescue Operations:**

The S&R team is guided by a single command structure, with priority given to the highest vulnerability areas, where rescue posts are established. S&R equipment, such as boats, ropes, floating tubes, and life jackets, is always available.

## Australia

National Emergency Management Australia (NEMA) is an Australian government executive agency that helps those affected by natural disasters. It is an agency of the Department of Home Affairs. Its responsibilities span disaster risk reduction, critical incident planning, disaster preparedness, and recovery, as well as crisis and security management (NEMA, 2022). NEMA provides informed oversight and guidance, staying constantly connected with local communities to help them respond and recover.

It prepares flood emergency plans, advocates for communities to remain prepared during emergencies, and guides them on how to recover. NEMA staff across Australia coordinates with communities, shares lessons learned, provides situational awareness, tracks trends in disasters, raises awareness of government services, and gathers community ideas and concepts to inform strategic policy and planning (EMV, 2022). Monitoring and operational coordination include early warning systems, evacuation plans, disaster communications, and public education. The response includes the rehabilitation of affected communities to safer places, quick action in the supply of goods and services like medicine, food, and water, which helps in a quick recovery and limited loss after a disaster.

**Lessons Learned from Best Practices**

Various benchmarks can be derived from the best practices studied during the exercise to reduce injuries, loss of property, and recovery time during floods. All three countries have developed efficient and accurate flood forecasting, monitoring, and early warning systems that should be replicated in our system. Moreover, effective coordination and logistics movement should be prioritized to avoid overlapping duties/responsibilities and ensure the timely mobilization of response teams, equipment, and commodities. Time is a crucial factor during evacuation, with special care given to the elderly and handicapped. The prior identification of safe areas for temporary refuge during floods should be followed. The community's awareness of the risks they face regarding floods and the actions to be taken is vital for an effective emergency response.

# Analysis

**ToR (c) Carry out SWOT-EETH analysis of the government structures mandated to evacuate the stranded people and provide optimal security to flood affecters.**

*SWOT Analysis*

| | |
|---|---|
| **Strengths** | ➢ Strong coordination among stakeholders<br>➢ Establishment of control room at DC Office<br>➢ Availability of Contingency plan at District level<br>➢ Strong ambulance network with 1122<br>➢ Established outreach of Rescue 1122<br>➢ Effective role of police in mobilizing the masses for evacuation |
| **Weaknesses** | ➢ Non establishment of DDMA in light of NDMA Act 2010<br>➢ PDMA- ROB are silent on the vital areas of rescue and evacuation<br>➢ No Provincial Disaster Management Act is in place<br>➢ Lack of evacuation and rescue related equipment's<br>➢ Non removal of encroachments from river banks, canals and roads<br>➢ No drive for cleaning of major drains before floods<br>➢ Poor working of municipals committees at tehsil and district level<br>➢ No designated flood wings at district levels<br>➢ No capacity building trainings for rescue staff<br>➢ No helicopter service is available for rescue<br>➢ Very Limited boats were available for rescue<br>➢ Less focus on mobilizing the local communities<br>➢ Mock exercises were not held<br>➢ No alternate way of communication due to network failures<br>➢ No transportation vehicles were available for livestock evacuation<br>➢ Weak security provisions at the evacuated villages<br>➢ Less media awareness campaign |

| | |
|---|---|
| **Opportunities** | ➢ Utilization of advanced technologies for rescue and evacuation drive<br>➢ Organizing the passionate volunteers at UC and VC level<br>➢ Support of NDMA regarding capacity building and other resources<br>➢ Inclusion of Pak Army support in the contingency plan<br>➢ Extension of Resuce-1122 services at all tehsil levels |
| **Threats** | ➢ Climate change and global warming<br>➢ Unplanned urban sprawling<br>➢ Encroachment at river banks<br>➢ Political interference<br>➢ No provision of relief funds and relief items on need basis |

*EETH Analysis*

| | |
|---|---|
| **Enhancing the Strengths** | ➢ Enhancing the effectiveness of control room by including Army representation<br>➢ Effective implementation of Contingency plan at District level<br>➢ Increasing number of ambulances at vulnerable districts<br>➢ Extending and enhancing the outreach of Rescue 1122<br>➢ Extending proper mandate of security related issues to police in the contingency plans |
| **Eliminating the Weaknesses** | ➢ PDMA Act need to be framed with clearly defined roles and responsibilities of stakeholders<br>➢ DDMA must be established<br>➢ PDMA- ROB need to be amended to include areas of rescue and evacuation<br>➢ Provision of required funds/ rescue and evacuation related equipments<br>➢ Proper cleaning of choked drains and removal of encroachments before moonsoon<br>➢ Proper trainings of diving and other flood related rescue/evacuation operations<br>➢ Ensure availability of two heli and sufficient boats, remote control life buoy for rescue activities<br>➢ Carry out mock exercises, mobilize local communities, proper evacuation and transportation arrangements |
| **Taking Advantage of Opportunities** | ➢ Use of latest rescue and evacuation technologies<br>➢ Volunteer force will be available in emergency<br>➢ Effective coordination and timely response<br>➢ Adopting best practices in rescue/evacuation areas |
| **Hedging against Threats** | ➢ Forestation drive<br>➢ New dwellings plans must be approved by concerned authorities |

| | |
|---|---|
| | ➢ Strengthening institutions |

## *GAP Analysis*

| **GAP ANALYSIS** | | |
|---|---|---|
| **Area under Consideration** | **Legal Gaps** | |
| **Desired State** | **Current State** | **Action Taken** |
| ➢ PDMA Act<br>➢ Establishing full-fledged District Disaster Management Authorities at every district | ➢ No PDMA Act<br>➢ DDMUs with weak mandate and less resources | ➢ Provincial Assembly to pass PDMA Act with mandatory provision to establish DDMA |
| **Area under Consideration** | **Resources Gap** | |
| **Desired State** | **Current State** | **Action Taken** |
| ➢ Helicopters at disposal of PDMA for rescue operations<br>➢ Availability of required amount of boats, tents and life jackets at disposal of district administration<br>➢ Large vehicles for transportation of humans and livestock | ➢ Helicopters were not available with PDMA for rescue operation<br>➢ Districts faced shortage of boats, life jackets and tents<br>➢ Shortage of Large vehicle | ➢ Helicopters be purchased by PDMA as soon as possible<br>➢ Boats, tents and life jackets be purchased<br>➢ Large vehicles be purchased and placed at disposal of rescue and relief operation teams for disaster activities |
| **Area under Consideration** | **Technological Gap** | |
| **Desired State** | **Current State** | **Action Taken** |
| ➢ Around 300 telemetries must be installed for early warning system | ➢ There are below 30 telemetries installed at present<br>➢ No system in place at present | ➢ Acquisition of required telemetries<br>➢ To design an application for |

| | | |
|---|---|---|
| ➢ Rescue teams should be enable to trace the exact location (coordinates) of people in need of evacuation | | evacuation and rescue help |
| ➢ Availability of Real time data (meteorological and hydrological observations) for informed decision making | ➢ Conventional means are used for calculating the riverine flood time | ➢ DC office must have access of GIS mapping of floods from SUPARCO for real time calculation |
| ➢ Established places like raised platforms near vulnerable villages for safety of humans and livestock at time of crisis | ➢ At present there is no such system in place | ➢ Develop consensus of stakeholders on the proposal and if agreed, provide funds for the same |
| ➢ Standardized warehousing | ➢ Warehouses are made on make shift arrangements | ➢ Preparation of PC-Is for construction of standardized warehouses especially at vulnerable districts |
| ➢ Acquire latest technological tools for recue and evacuation activities | ➢ Absence of state of the art technologies like remote control life buoy etc | ➢ Purchase latest technological tools and train human resource who can operate that technologies |

## *Challenges during Rescue and Evacuation*

After carrying out research and critically analyzing the data and applying analytical tools, following issues and challenges were highlighted for effective operations of rescue and evacuation activities during recent floods.

- Mock exercises were not carried out except Nowshera
- Enough boats were not available
- No heli was available at all
- Lack of professional divers
- Required telemetries were not available
- Lack of machinery and heavy vehicles
- No prior announcement was made in many districts
- Evacuation of livestock was a serious issue
- Absence of state of the art warehouses
- Poor medical treatments especially for snake bite and dengue
- Poor performance of civil defense department
- Relief camps were not established at suitable places e.g. Charsada
- Lack of seriousness on part of many district administrations towards weather alerts issued by PDMA prior to the flood

## *Conclusion*

From the aforementioned discourse, it is concluded that the district administration, 1122, and police did their best to cope with the recent floods of 2022 in KP. However, due to serious gaps and issues in the context of evacuation, 311 deaths and 381 injuries occurred in KP. Apart from Nowshera, the rest of the districts were not prepared in advance and showed a reactive approach instead of a proactive approach to the flood. Deficiencies in vital resources such as early warning systems, boats, heavy vehicles, divers, helicopters, etc., placed limitations on the capacity of the district administrations to evacuate as many people as possible from the flood. Gaps in the distribution of resources among districts were also observed. Politically important districts, closer to the provincial capital, were given preference over peripheral districts. District Disaster Management Authorities have not yet been established by PDMA in line with the provisions of the NDMA Act. Similarly, several security lapses were identified when a public survey was conducted in the flood-affected districts. The survey results revealed that a significant number of people were not satisfied with the security of their homes and belongings when they were evacuated to relief camps. In a nutshell, the evacuation aspect of disaster management has been less attended to by the government, as evidenced by the fact that in PDMA Rules of Business, there is not a single mention of evacuation.

## *Recommendations*

### *Short Term Measures*

- Contingency plan should be made on scientific basis using the Geographical Information System to identify most flood prone areas and to ascertain safe / feasible places for establishment of relief camps.
- Keeping in view the requirement of the Districts, proper funds, flood related rescue / evacuation equipment should be provided immediately after formulation of monsoon contingency plan.
- Effective early warning system should be installed on River Indus, River Swat and River Kabul to quantify the magnitude of floods and issue flood alerts to the concerned authorities for better management.

**Logical Framework based on 80/20 Principle for Effective Early Warning System by Installing Telemetries**

| Assumption and Risk | Resources / Inputs | Activities | Outputs | Outcomes | Impact |
|---|---|---|---|---|---|
| • Lack of future foresightedness<br>• Financial Constraints<br>• Consensus of stakeholders is not reached to install new telemetries<br>• Lack of awareness<br>• Political will | • Purchase and install desired telemetries | • Analyzing post flood assessment reports<br>• Training of human resource | • Efficient early warning system in place | • Improved and efficient service delivery with regard to evacuation and relief operations during floods | • To save the life and property of people and minimize damages during disasters like floods |

## *Medium Term Recommendations*

- Recruitment of divers in all districts, purchase of latest technological boats /remote control lifebuoy as well as cleanliness / removal of encroachment from all drains and rivers should be ensured before monsoon
- Formulation of PDMA Act at the earliest entailing early warning, rescue and evacuation mechanism in detail
- Under this Act DDMA should be constituted in every district

**Logical Framework based on 80/20 Principle for Establishment of DDMA**

| Assumption and Risk | Resources / Inputs | Activities | Outputs | Outcomes | Impact |
|---|---|---|---|---|---|
| • Lack of Administrative will<br>• Lack of Political will<br>• Financial Constraint | • Human Resources<br>• Finances<br>• Equipment<br>• Building | • Recruitment<br>• Trainings and capacity buildings<br>• Workshops<br>• Technical Trainings | • Fully functional DDMA in every district with trained staff and equipment | • Quick, efficicient and improved disaster management | • To save the life and property of people and minimize damages during disasters like floods and earthquackes |

## *Long Term Recommendations*

- Proper mechanism for purchase of required rescue and evacuation items in time of emergency should be laid down to avoid any delay in the operation
- Merger of Civil Defense with Rescue 1122 or DDMU so as to organize and train thousands of volunteers in all districts
- Construction of standard warehouses in all districts for safe custody of rescue and relief items to avoid damages

**Logical Framework based on 80/20 Principle for Construction of Standardized Warehousing**

| Assumption and Risk | Resources / Inputs | Activities | Outputs | Outcomes | Impact |
|---|---|---|---|---|---|
| • Less priority<br>• Financial Constraint | • Finances<br>• Land<br>• Building | • Construction of Building | • Standardized warehouse | • Safe custody of relief items | • Minimal damages to relief items<br>• Timely availability of relief items during disaster<br>• Savings for government kitty |

## *References*


1. EMV. (2022). Role statement - Australian Government Department of Home Affairs. Emergency Management Victoria. Retrieved from https://www.emv.vic.gov.au/responsibilities/semp/roles-and-responsibilities/role-statements/aus-gov-dept-of-home-affairs
2. FEMA. (2022). Strategic plan. Federal Emergency Management Agency. Retrieved from https://www.fema.gov/about#:~:text=Our%20mission%20is%20helping%20people,goals%20help%20us%20achieve%20it.&text=The%20Federal%20Emergency%20Management%20Agency,offices%20located%20across%20the%20country.
3. Imdad, H. (2022). CLIMATE CHANGE IS HERE TO STAY, BUT COULD FLOODS BE MANAGED BETTER? Tribune Magazine. Retrieved from https://tribune.com.pk/story/2377205/climate-change-is-here-to-stay-but-could-floods-be-managed-better
4. Kobayashi, Y. (2012). Flood Risk Management. Asian Development Bank. Retrieved from https://www.adb.org/sites/default/files/publication/29717/flood-risk-management-prc.pdf
5. MOPD&SI. (2022). Post Disaster Needs Assessment.
6. NDMA. (2010). National Disaster Management Authority. Islamabad.
7. NEMA. (2022). Emergency Management. National Emergency Management Agency. Retrieved from https://www.homeaffairs.gov.au/about-us/our-portfolios/emergency-management/about-emergency-management
8. Stefańska, M. B. (2022). The Role of Road Transportation in the Flood Evacuation Process. Retrieved from https://oxfordre.com/naturalhazardscience/view/10.1093/acrefore/9780199389407.001.0001/acrefore-9780199389407-e-440
9. Stephen, O. E. (2010). Timeline Modelling of Flood Evacuation Operation. www.elsevier.com.