MHVRA INFORMED DISASTER MANAGEMENT PLAN 2023-2032

DISTRICT SHAHEED BENAZIRABAD











WITH THE SUPPORT OF



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PREFACE

Multi-Hazard Vulnerability Risk Assessment (MHVRA) and resultant database are the foundation for evidence-based disaster management plan. Such databases are also an integral part of the implementation of disaster risk reduction and disaster risk management strategies. The MHVRA study of the Shaheed Benazirabad district has been conducted successfully using high-resolution satellite imagery and its products like digital elevation models, historical disaster datasets, hydro-meteorological data, pertinent socio-economic data, and various other essential datasets. The hazard, vulnerability, and risk maps at Union Council (UC) level have been prepared and compiled as atlases. Using disaster risk information obtained through MHVRA, the disaster management plan of district Shaheed Benazirabad is prepared and being presented to disaster management practitioners, executors, and prominent stakeholders. Before the MHVRA study, the district-level disaster and contingency plans were prepared using conventional methods and human knowledge. In contrast, the MHVRA based disaster management plans are realistic, based on modern techniques and multiple data sources, therefore, are more authentic and reliable for planning and management of disasters in the district.

The disaster management plans are based on MHVRA study carried out to understand the hazard vulnerability and risk at UC levels. The multi-criteria approach used in this disaster management plan offers comprehensive understanding of vulnerable communities at UC levels, while offering concerned authorities with viable and best practices to minimize the hazard impacts to the communities. Also, costbenefit analysis for recommended mitigation efforts provides clear actionable insights for relevant authorities to take necessary measures.

District-wise disaster management plans will be revised after 10 years on updation of the MHVRA study. The disaster management plan of Shaheed Benazirabad is comprehensive and covers guidelines on the complete spectrum of disaster management and standard operating procedures to efficiently cope with disasters and emergencies in the district.

The disaster management plan is duly approved by Provincial Disaster Management Board and demands its proactive implementation in true letter and spirit. The proactive implementation of the plan will ensure reduced disaster losses and damages in the district.

ACKNOWLEDGEMENTS

Multi-Hazard Vulnerability Risk Assessment (MHVRA) based Informed Disaster Management Plan (IDMP) for Sindh Province will help to strengthen the institutional and community level capacity to plan and implement natural hazard risk preparedness, recovery, and reduction in the province through capacity building, public education, and awareness by undertaking steps to reinforce physical, environmental and economic elements, as well as psychosocial wellbeing of communities.

SUPARCO appreciates and acknowledges the efforts of the project officials and professionals' team in preparing this comprehensive IDMP. We would also like to extend special thanks to the Project Director and Project Coordinator, Sindh Resilience Project (SRP), for their valuable inputs and necessary support required during the execution of different project activities.

- - Disclaimer - -

The Informed Disaster Management Plan (IDMP), the product of "Multi-Hazard Vulnerability Risk Assessment (MHVRA) Study" developed for Provincial Disaster Management Authority (PDMA) Sindh under Sindh Resilience Project (PDMA Component) by Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) is based on results of MHVRA 2022 study, satellite imagery, data and information obtained from concerned departments and verifiable online sources. Every effort has been made to make this plan practical and free of errors, however, PDMA Sindh or SUPARCO are not liable for any discrepancy in data obtained from various departments. The Informed Disaster Management Plan or any part of it is not to be used for legal or litigation matters and commercial use. However, the information contained in the IDMP or any part of the IDMP can be used without prior permission of PDMA Sindh with proper citation and acknowledgements.





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INTRODUCTION TO DISASTER MANAGEMENT PLAN OF DISTRICT SHAHEED BENAZIRABAD

INTRODUCTION

As per the declaration of National Disaster Management Act 2010, the districts are required to develop disaster management plans to effectively cope with disasters and emergencies at district level. The objective of district wise disaster management plan is to adopt a proactive approach in managing disaster risk by building capacity and strengthening institutional mechanisms. The plan is aimed to provide direction and guidelines to district governments and other stakeholders, in a paradigm shift from reactive to a proactive approach, and to layout the standard operating procedures to be followed in the complete cycle of disaster management.

Multi-Hazard Vulnerability and Risk Assessment (MHVRA) is integral for proactive risk management, hence under Sindh Resilience Project (PDMA Component), MHVRA has been conducted at the Provincial level. MHVRA is a multi-disciplinary process involving the quantification of the frequency and intensity of possible hazard(s), the assessment of the elements that can be destroyed or damaged from possible disasters, and the degree of the damage each element can sustain when affected by certain disasters of various intensities. The assessment of hazard, exposure, vulnerability and capacity leads to the risk assessment, which indicates the anticipated damages in case of a possible disaster. Disaster risk assessment is normally the first step in planning for disaster management activities. It provides an evidence-based estimation of the risk so that effective risk reduction measures can be employed appropriately and cost-effectively.

The development of MHVRA informed disaster management plan is based on diversified information sources including satellite remote sensing, Digital Elevation Model (DEM), and pertinent information collected from concerned departments. The outcomes for MHVRA study are depicted in atlas including; landuse / landcover, critical infrastructure, hazard, exposure, vulnerability, and risk maps of cyclone and storm surge, drought, earthquake, flood, heatwave, and tsunami at UC level.

The MHVRA Informed Disaster Management Plan is a significant step towards disaster resilient Sindh because the foundation of disaster management plan is laid on realistic disaster risk identification and efficient need-based disaster preparedness and response measures. UC-level multi-disaster risk identification will not only enable active and effective disaster preparedness but also help in disaster risk reduction at the grass-root level. In addition, the plan is intended to strengthen the district disaster management system and provide guidance on pre-disaster preparedness, coordinated response and recovery through implementable agenda.

VISION

Vision of MHVRA Informed Disaster Management Plan is;

- To identify underlying UC level multi-disaster risks in administrative districts of Sindh province.
- To develop realistic Disaster Management Plan for proactive disaster management.
- To ensure prioritization of disaster risk reduction measures at UC level.
- To enforce better coordination for disaster response.
- To improve rehabilitation plans for restoration of livelihood, and organizational capacities of affected communities.

OBJECTIVES

The plan is intended to meet following objectives in 10 years;

- 1. Building disaster resilience capacity at UC level to minimize the loss of lives, livelihood, assets and environment.
- 2. Improved understanding of disaster risk, hazard and vulnerabilities to strengthen disaster governance from local level to provincial level.
- 3. Enhanced preparedness to improve disaster response at grass-root level.
- 4. Promote and facilitate Disaster Risk Reduction (DRR) in planning and implementation of development projects to increase resilience.
- 5. Provide clarity on roles and responsibilities of various departments and stakeholders involved in different aspects of disaster management.
- 6. Promote "Build Back Better" principle in recovery, rehabilitation and reconstruction.
- 7. Promote social inclusion and communities as partners to reduce and manage disaster risk.
- 8. Promote disaster prevention and mitigation culture at local level.

REVIEW OF MHVRA INFORMED DISASTER MANAGEMENT PLAN

The MHVRA Informed Disaster Management Plan is planned to be effective for 10 years starting from January 2023 to December 2032 and requires review before completion of 10 years. Periodic review is essential because of following reasons;

1. During 10 years, there will be likely chances of new development in the district hence, vulnerability, exposure, and risk assessment will require updation.

- Planning is a dynamic process, therefore, disaster management plan must be reviewed periodically to incorporate changes according to the emergence of new eminent disasters and situations.
- 2. Climate is a dynamic driver of changing hazard risks, therefore, it is important to review disaster management plan in changing disaster scenarios.

Additionally, it is also recommended to review the plan after the occurrence of each disaster event to measure its effectiveness. Necessary adjustment may be carried out in the plan accordingly.

Foregoing in view, it is recommended to formulate a committee to review the disaster management plan. A review of the plan shall be carried out by the concerned DDMA under the supervisory role of PDMA Sindh. Recommended composition of the plan review committee is as follows;

| Committee Representative | Role |
|--|------------|
| DG, PDMA Sindh / Dir Ops PDMA | Chairman |
| Concerned DC or representative officer | Member |
| Concerned officer from local government | Member |
| Elected representative of the concerned district | Member |
| Representatives from disaster affected communities | Member (s) |
| Representative from SUPARCO | Member |
| Representative from research / academia experienced in disaster management field | Member (s) |
| Representative from UN Organization on disaster related domains in Pakistan, especially in Sindh | Member |
| Representative from reputed NGO working on disaster related domains especially in Sindh | Member |

| Table | 1: Recommended | Committee | for Reviewing | Disaster | Managemer | nt Plan |
|-------|----------------|-----------|----------------|----------|-----------|---------|
| IUDIC | I. Kecommended | Commee | ioi keviewilig | Pisusici | managemen | |

MODES OF REVIEW

Preferred modes of review of plan are;

- a. For a post-disaster review of the plan, PDMA shall conduct a questionnaire-based survey covering pertinent questions to identify gaps or issues in the plan. A questionnaire-based survey can be conducted through online survey services or organizing online meetings. Once issues have been identified by the committee, necessary changes be incorporated in the plan and the revised plan be approved by review committee.
- b. For review before the expiry of the validity of the plan, necessary updation in baseline mapping i.e., hazard, exposure, vulnerability, and risk assessment be carried out to incorporate new developments and disaster situations. Once, baseline mapping is updated, plan is to be updated accordingly. The review committee shall vet the updation of the plan in the light of experience and recommendations. Upon approval from the review committee, the plan shall be effective for next 10-years.

DISASTER RISK PROFILE OF DISTRICT SHAHEED BENAZIRABAD

DISTRICT SHAHEED BENAZIRABAD AT A GLANCE



GEOGRAPHY

| District area in Sq. Km | 4,392 | |
|--------------------------------|--|-----------------------|
| Coordinates | Longitude 67° 54' 19" to 68° 39' 7" East | |
| | Latitude 26º 10' 26" to | 26º 33' 38" North |
| Surrounding Districts | Khairpur and Sanghar i | n the East |
| | Jamshoro in the West | |
| | Naushahro Feroze and | Khairpur in the North |
| | Matiari in the South | |
| Climate Conditions | Hot and Semi-Arid | |
| Coldest Month | January | |
| Hottest Month | Мау | |
| Seasonal Temperatures | Max Mean (∘C) | Min Mean (°C) |
| Spring (March and April) | 38.32 | 20.70 |
| Dry Summer (May and June) | 44.85 | 28.22 |
| Wet Summer (July to September) | 41.22 | 27.75 |
| Autumn (October to November) | 35.48 | 19.37 |
| Winter (December to February) | 27.01 | 11.03 |
| Average Rainfall | 110.86 mm/year | |
| Physiographic Features | Indus river flows along the left bank of the district. | |
| | Eastern part of the district comprises of barren desert lands in daur tehsil | |

DEMOGRAPHY

| | Year-1998 | Year-2017 |
|--------------------------------------|-----------|-----------|
| Population | 1,102,584 | 1,613,506 |
| Urban | 282,359 | 489,810 |
| Rural | 820,225 | 1,123,696 |
| No. of Household | - | 297,133 |
| Average Annual Growth Rate 1998-2017 | 2.02 % | |

| Mills, Small (2016-17) |
|------------------------------------|
| (2016-17) |
| - |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |

ADMINISTRATIVE SYSTEM

| TALUKA NAMES | UC NAMES |
|---|--|
| 1. Daur Taluka 2. Kazi Ahmed Taluka 3. Nawabshah Taluka 4. Sakrand Taluka | UC NAMES 1. 60th Mile 2. A 3. Abdul Hassan 4. Ahmed Bughio 5. Amirji 6. Bandhi 7. Bheri 8. Bhura 9. Chanesar 01 10. Chanesar 02 11. Dalildero 12. Daulatpur 13. Daur 14. Ghandtar 15. Ghulam Hyder Shah 16. Guhram Mari 17. Haberi 18. Hamal Faqir 19. Jam Sahib 20. Jamalshah 21. Jhoro Khan Shar 22. Karam Jamali 23. Khadhar 24. Khair Shah 25. Khar 26. Kumbleema 27. Manharo 28. Marvi 29. Mehrabpur 30. Mirzabagh 31. Nawabshah 04 32. Obharisawari |
| | 23. Khadhar 24. Khair Shah 25. Khar 26. Kumbleema 27. Manharo 28. Marvi 29. Mehrabpur 30. Mirzabagh |
| | 31. Nawabshah 04 32. Obharisawari 33. Pir Zaki 34. Qazi Ahmed 01 35. Qazi Ahmed 02 36. Rais Mohammad I K. Brohi 37. Said Kando 38. Sakrand 02 39. Sawari 40. Suhello |



SHAHEED BENAZIRABAD DISTRICT MULTI-HAZARD RISK PROFILES



UC WISE RISK PROFILE

| 60 TH MILE | | | |
|-----------------------|------------------|---|--------------------|
| Hazard Type | Risk | Elements at Risk | |
| | | Agriculture Area | 80.279 sq km |
| | | Pakka Unplanned Area | 2.371 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 72 |
| | | Mobile Towers | 2 |
| | | Petrol Pumps | 1 |
| Earthquake | LOW | Police Stations | 1 |
| | | Settlements | 83 |
| | | Irrigation and Drainage Network | 51.681 km |
| | | Road Network | 124.943 km |
| | | Population | 31789 |
| | | Household | 5728 |
| | | • | |
| | | Settlements | 83 |
| | | Agriculture Area | 80.399 sq km |
| Meteorological | | Bare Area with sparse Natural | 2.074 sq km |
| Drought | Medium - Extreme | Vegetation | 1.017 cg km |
| | | Population | 25917 |
| | | Household | 23017 |
| | | Household | 4030 |
| | | Sattlements | 13 |
| | Low - High | | 38.438 cg.km |
| | | Bare Area with sparse Natural | |
| Agricultural Drought | | Vegetation | 1.067 sq km |
| | | Wet Area | 0.854 sq km |
| | | Population | 2271 |
| | | Household | 407 |
| | | | |
| | Low - High | Settlements | 80 |
| | | Population | 25606 |
| Heatwave | | Household | 4613 |
| | | Agriculture Area | 80.246 sq km |
| | | Pakka Unplanned Area | 2.378 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |

| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge |
|-------------|-----|---|

| Α | | | |
|---------------------------|------------------|---|---------------|
| Hazard Type | Risk | Elements at Risk | |
| | | Agriculture Area | 110.382 sq km |
| | | Forest Area | 0.008 sq km |
| | | Kachcha Area | 0.014 sq km |
| | | Natural Vegetation in Wet Areas | 0.003 sq km |
| | | Pakka Planned Area | 0.108 sq km |
| | | Pakka Unplanned Area | 3.429 sq km |
| | | Range Land | 0.048 sq km |
| | | Bridges | 2 |
| Earthquake | Low | Education Facilities | 160 |
| | | Health Facilities | 3 |
| | | Mobile Towers | 1 |
| | | Settlements | 144 |
| | | Irrigation and Drainage Network | 52.96 km |
| | | Railway Line | 10.018 km |
| | | Road Network | 264.983 km |
| | | Population | 43671 |
| | | Household | 8112 |
| | | | |
| | Medium - Extreme | Settlements | 144 |
| | | Agriculture Area | 110.61 sq km |
| | | Bare Area with sparse Natural | 0.037 sa km |
| Meteorological Drought | | Vegetation | |
| | | Forest Area | 0.061 sq km |
| | | Natural Vegetation in Wet Areas | 0.075 sq km |
| | | Range Land | 1.57 sq km |
| | | Water Body | 0.151 sq km |
| | | Wet Area | 0.911 sq km |
| | | Population | 35/2/ |
| | | Household | 6636 |
| | | | |
| | | | 30 |
| Agricultural Drought | | Agriculture Area Bare Area with sparse Natural | 38.503 sq km |
| | | Vegetation | 0.046 sq km |
| | | Forest Area | 0.074 sq km |
| | Low – Medium | Natural Vegetation in Wet Areas | 0.092 sq km |
| | | Range Land | 1.937 sq km |
| | | Water Body | 0.186 sq km |
| | | Wet Area | 0.187 sq km |
| | | Population | 7465 |

| | | Household | 1349 |
|-----------------------|------------|--|---------------|
| | | | |
| | | Settlements | 141 |
| | | Population | 35297 |
| | | Household | 6564 |
| Heatwave | Low - High | Agriculture Area | 110.315 sq km |
| | | Kachcha Area | 0.014 sq km |
| | | Pakka Planned Area | 0.108 sq km |
| | | Pakka Unplanned Area | 3.438 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| ABDUL HASSAN | | | | |
|------------------|------------------|--|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 78.642 sq km | |
| | | Natural Vegetation in Wet Areas | 0.028 sq km | |
| | | Pakka Unplanned Area | 1.879 sq km | |
| | | Range Land | 0.002 sq km | |
| | | Education Facilities | 56 | |
| F and have a los | | Petrol Pumps | 1 | |
| Earthquake | LOW | Settlements | 69 | |
| | | Irrigation and Drainage Network | 33.697 km | |
| | | Railway Line | 3.712 km | |
| | | Road Network | 162.464 km | |
| | | Population | 26343 | |
| | | Household | 4831 | |
| | | · | · | |
| | | Settlements | 68 | |
| | | Agriculture Area | 78.72 sq km | |
| | | Bare Area with sparse Natural Vegetation | 0.372 sq km | |
| Meteorological | | Natural Vegetation in Wet Areas | 0.324 sq km | |
| Drought | Medium - Extreme | Range Land | 0.084 sq km | |
| | | Water Body | 0.79 sq km | |
| | | Wet Area | 2.469 sq km | |
| | | Population | 21356 | |
| | | Household | 3920 | |
| | | | | |

| | | Settlements | 11 |
|----------------------|--------------|---|----------------------|
| | | Agriculture Area | 12.042 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.354 sq km |
| Agricultural Drought | Low - Medium | Range Land | 0.105 sq km |
| | | Water Body | 0.985 sq km |
| | | Wet Area | 1.671 sq km |
| | | Population | 3153 |
| | | Household | 576 |
| | | | |
| | Low - High | Settlements | 67 |
| | | Population | 21202 |
| Heatwave | | Household | 3889 |
| | | Agriculture Area | 78.609 sq km |
| | | Pakka Unplanned Area | 1.887 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | e for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | e for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| | A | HMED BHUGIO | | |
|----------------|------------------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 85.876 sq km | |
| | | Forest Area | 0.011 sq km | |
| | | Pakka Planned Area | 0.085 sq km | |
| | | Pakka Unplanned Area | 1.836 sq km | |
| | | Range Land | 0.043 sq km | |
| | | Education Facilities | 86 | |
| | Low | Health Facilities | 1 | |
| Earthquake | | Mobile Towers | 2 | |
| | | Petrol Pumps | 4 | |
| | | Police Stations | 1 | |
| | | Settlements | 55 | |
| | | Irrigation and Drainage Network | 12.489 km | |
| | | Road Network | 120.026 km | |
| | | Population | 30086 | |
| | | Household | 5668 | |
| | | | | |
| Meteorological | Madium Entropy | Settlements | 55 | |
| Drought | Mealum - Exfreme | Agriculture Area | 85.974 sq km | |

| | | Bare Area with sparse Natural | 0.153 sg km |
|----------------------|-------------|---|----------------------|
| | | Vegetation Forest Area | 0.211 sq.km |
| | | Range Land | 0.972 sq km |
| | | Wet Areg | 1.855 sq km |
| | | Population | 24438 |
| | | Household | 4604 |
| | | | 4004 |
| | | Settlements | 30 |
| | | Agriculture Areg | 73 789 cg km |
| | | Baro Aroa with sparso Natural | 7 3.7 67 SQ KIII |
| | | Vegetation | 0.191 sq km |
| Agricultural Drought | low - High | Forest Area | 0.263 sq km |
| | Low - riigh | Range Land | 1.211 sq km |
| | | Wet Area | 2.309 sq km |
| | | Population | 17875 |
| | | Household | 3367 |
| | | | I |
| | | Settlements | 55 |
| | | Population | 24274 |
| | | Household | 4573 |
| Heatwave | Low - High | Agriculture Area | 85.843 sq km |
| | | Pakka Planned Area | 0.086 sq km |
| | | Pakka Unplanned Area | 1.844 sq km |
| | 1 | | 1 |
| Riverine Flood | Nil | The UC falls out of vulnerable zon | e for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zon | e for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zon | e for Storm Surge |

| AMIRJI | | | | |
|-------------|------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 96.989 sq km | |
| | Low | Forest Area | 0.001 sq km | |
| Earthquake | | Natural Vegetation in Wet Areas | 0.201 sq km | |
| | | Pakka Planned Area | 0.102 sq km | |
| | | Pakka Unplanned Area | 2.832 sq km | |
| | | Range Land | 0.111 sq km | |
| | | Bridges | 3 | |
| | | Education Facilities | 98 | |
| | | Industries | 1 | |

| | | Petrol Pumps | 1 |
|----------------------|------------------|---|--------------------|
| | | Settlements | 119 |
| | | Irrigation and Drainage Network | 76.923 km |
| | | Road Network | 164.691 km |
| | | Population | 38601 |
| | | Household | 6983 |
| _ | 1 | | |
| | | Settlements | 119 |
| | | Agriculture Area | 97.504 sq km |
| | | Bare Area with sparse Natural Vegetation | 280.513 sq km |
| | | Forest Area | 0.054 sq km |
| Meteorological | Medium - Extreme | Natural Vegetation in Wet Areas | 2.978 sq km |
| Drought | | Range Land | 2.559 sq km |
| | | Water Body | 1.56 sq km |
| | | Wet Area | 0.893 sq km |
| | | Population | 31451 |
| | | Household | 5689 |
| | | | |
| | | Settlements | 24 |
| | | Agriculture Area | 27.366 sq km |
| | | Bare Area with sparse Natural Vegetation | 301.651 sq km |
| | | Forest Area | 0.067 sq km |
| Agricultural Drought | Low - Extreme | Natural Vegetation in Wet Areas | 2.12 sq km |
| | | Range Land | 3.049 sq km |
| | | Water Body | 1.856 sq km |
| | | Wet Area | 0.004 sq km |
| | | Population | 6636 |
| | | Household | 1195 |
| | 1 | | 1 |
| | | Settlements | 114 |
| | | Population | 31038 |
| Heatwaye | low - High | Household | 5615 |
| | 20.0 mgn | Agriculture Area | 96.822 sq km |
| | | Pakka Planned Area | 0.102 sq km |
| | | Pakka Unplanned Area | 2.845 sq km |
| | I | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | 1 | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | 1 | | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami |
| | 1 | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge |

| BANDHI | | | |
|----------------------|------------------|---|--------------|
| Hazard Type | Risk | Elements at Ris | k |
| | | Agriculture Area | 71.586 sq km |
| | | Pakka Planned Area | 1.12 sq km |
| | | Pakka Unplanned Area | 1.901 sq km |
| | | Range Land | 0.064 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 80 |
| | | Health Facilities | 4 |
| | | Mobile Towers | 4 |
| Earthquake | LOW | Petrol Pumps | 8 |
| | | Police Stations | 1 |
| | | Settlements | 72 |
| | | Irrigation and Drainage Network | 40.068 km |
| | | Railway Line | 12.414 km |
| | | Road Network | 166.639 km |
| | | Population | 60091 |
| | | Household | 11002 |
| | 1 | | 1 |
| | | Settlements | 72 |
| | | Agriculture Area | 71.81 sq km |
| | Medium - Extreme | Bare Area with sparse Natural Vegetation | 13.241 sq km |
| | | Forest Area | 0.01 sq km |
| Meteorological | | Natural Vegetation in Wet Areas | 0.242 sq km |
| Drought | | Range Land | 0.986 sq km |
| | | Water Body | 2.758 sq km |
| | | Wet Area | 5.521 sq km |
| | | Population | 48491 |
| | | Household | 8878 |
| | | - | |
| | | Settlements | 8 |
| | | Agriculture Area | 16.845 sq km |
| | | Bare Area with sparse Natural Vegetation | 7.844 sq km |
| | | Forest Area | 0.012 sq km |
| Agricultural Drought | Low - Medium | Natural Vegetation in Wet Areas | 0.297 sq km |
| g | | Range Land | 1.088 sq km |
| | | Water Body | 3.404 sq km |
| | | Wet Area | 2.452 sq km |
| | | Population | 3520 |
| | | Household | 665 |
| | • | | 1 |
| | | Settlements | 72 |
| Heatwave | Low - High | Population | 48161 |

| | | Household | 8814 | |
|-----------------------|-----|--------------------------------|--|--|
| | | Agriculture Area | 71.49 sq km | |
| | | Pakka Planned Area | 1.122 sq km | |
| | | Pakka Unplanned Area | 1.91 sq km | |
| | | | · | |
| Riverine Flood | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Cyclone | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Tsunami | |
| | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable | zone for Storm Surge | |

| BHERI | | | | |
|----------------------|------------------|--|----------------|--|
| Hazard Type | Risk | Elements at Ris | sk | |
| | | Agriculture Area | 54.682 sq km | |
| | | Forest Area | 0.000094 sq km | |
| | | Pakka Unplanned Area | 1.479 sq km | |
| | | Range Land | 0.044 sq km | |
| | | Bridges | 1 | |
| | | Education Facilities | 44 | |
| | | Health Facilities | 1 | |
| Earthquake | Low | Mobile Towers | 2 | |
| | | Petrol Pumps | 1 | |
| | | Settlements | 49 | |
| | | Irrigation and Drainage Network | 30.885 km | |
| | | Railway Line | 11.483 km | |
| | | Road Network | 79.707 km | |
| | | Population | 30107 | |
| | | Household | 5426 | |
| | | - | | |
| | | Settlements | 49 | |
| | | Agriculture Area | 54.795 sq km | |
| | | Bare Area with sparse Natural Vegetation | 8.479 sq km | |
| Meteorological | | Forest Area | 0.011 sq km | |
| Drought | Medium - Extreme | Range Land | 0.486 sq km | |
| | | Water Body | 3.975 sq km | |
| | | Wet Area | 0.589 sq km | |
| | | Population | 24420 | |
| | | Household | 4400 | |
| | | | | |
| Annieultunel Dreumht | Low High | Settlements | 27 | |
| Agricultural Drought | Low - High | Agriculture Area | 41.264 sq km | |

| | | Bare Area with sparse Natural Vegetation | 10.552 sq km |
|----------------|------------|---|----------------------|
| | | Forest Area | 0.014 sq km |
| | | Range Land | 0.605 sq km |
| | | Water Body | 4.949 sq km |
| | | Wet Area | 0.647 sq km |
| | | Population | 7322 |
| | | Household | 1343 |
| | | | |
| | | Settlements | 47 |
| | | Population | 24208 |
| Heatwave | Low - High | Household | 4363 |
| | | Agriculture Area | 54.642 sq km |
| | | Pakka Unplanned Area | 1.482 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zon | e for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| BHURA | | | | |
|---------------------------|------------------|---------------------------------|---------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 101.162 sq km | |
| | | Forest Area | 0.001 sq km | |
| | | Natural Vegetation in Wet Areas | 0.064 sq km | |
| | | Pakka Unplanned Area | 3.639 sq km | |
| | | Range Land | 0.04 sq km | |
| | | Bridges | 4 | |
| Earthquake | Low | Education Facilities | 72 | |
| | | Petrol Pumps | 1 | |
| | | Settlements | 82 | |
| | | Irrigation and Drainage Network | 20.827 km | |
| | | Road Network | 178.054 km | |
| | | Population | 41413 | |
| | | Household | 8075 | |
| | | | | |
| | | Settlements | 82 | |
| Meteorological Drought | | Agriculture Area | 101.381 sq km | |
| | Medium - Extreme | Forest Area | 0.034 sq km | |
| | | Natural Vegetation in Wet Areas | 4.291 sq km | |
| | | Range Land | 0.797 sq km | |

| | | Water Body | 1.667 sq km |
|----------------------|---------------|-------------------------------------|-----------------|
| | | Wet Area | 3.961 sq km |
| | | Population | 33680 |
| | | Household | 6563 |
| | · | | · |
| | | Settlements | 35 |
| | | Agriculture Area | 56.719 sq km |
| | | Forest Area | 0.042 sq km |
| | | Natural Vegetation in Wet Areas | 3.492 sq km |
| Agricultural Drought | Low - High | Range Land | 0.119 sq km |
| | | Water Body | 1.97 sq km |
| | | Wet Area | 0.042 sq km |
| | | Population | 14520 |
| | | Household | 2831 |
| | | | |
| | | Settlements | 81 |
| | | Population | 33470 |
| Heatwave | Low - High | Household | 6529 |
| | | Agriculture Area | 101.1 sq km |
| | | Pakka Unplanned Area | 3.651 sq km |
| | | | · |
| | | Agriculture Area | 22.408 sq km |
| | | Natural Vegetation in Wet Areas | 2.016 sq km |
| | | Pakka Unplanned Area | 0.21 sq km |
| | | Education Facilities | 2 |
| Riverine Flood | LOW - Exfreme | Settlements | 3 |
| | | Road Network | 4.472 km |
| | | Population | 2386 |
| | | Household | 465 |
| | | · · · | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami |
| | | · · · | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge |

| CHANESAR 01 | | | | |
|-----------------------|------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| Earthquake Low | | Agriculture Area | 56.349 sq km | |
| | Low | Natural Vegetation in Wet Areas | 0.195 sq km | |
| | | Pakka Unplanned Area | 2.007 sq km | |
| | | Range Land | 0.011 sq km | |
| | | Bridges | 3 | |
| | | Education Facilities | 80 | |

| | | Health Facilities | 1 |
|----------------------|------------------|---|--------------------|
| | | Mobile Towers | 1 |
| | | Settlements | 85 |
| | | Irrigation and Drainage Network | 28.916 km |
| | | Railway Line | 0.66 km |
| | | Road Network | 102.794 km |
| | | Population | 26212 |
| | | Household | 5042 |
| | · | | |
| | | Settlements | 85 |
| | | Agriculture Area | 56.507 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.744 sq km |
| Meteorological | | Natural Vegetation in Wet Areas | 6.399 sq km |
| Drought | Medium - Extreme | Range Land | 0.376 sq km |
| | | Water Body | 0.306 sq km |
| | | Wet Area | 2.221 sq km |
| | | Population | 21347 |
| | | Household | 4106 |
| | | | |
| | | Agriculture Area | 0.00028 sq km |
| Agricultural Drought | Low | Natural Vegetation in Wet Areas | 0.037 sq km |
| Agriconoral Droogin | | Range Land | 0.015 sq km |
| | | Wet Area | 0.000218 sq km |
| | 1 | | r |
| | | Settlements | 84 |
| | | Population | 21179 |
| Heatwave | Low - High | Household | 4075 |
| | | Agriculture Area | 56.294 sq km |
| | | Pakka Unplanned Area | 2.014 sq km |
| | 1 | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | tor Riverine Flood |
| | 1 | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | 1 | | · - · |
| Tsunami | Nil | The UC talls out of vulnerable zone | tor Isunami |
| | 1 | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| CHANESAR 02 | | | | |
|-----------------------------------|-----|---------------------------------|---------------|--|
| Hazard Type Risk Elements at Risk | | | | |
| Earthquake | | Agriculture Area | 130.039 sq km | |
| | Low | Natural Vegetation in Wet Areas | 0.068 sq km | |
| | | Pakka Planned Area | 1.566 sq km | |

| | | Pakka Unplanned Area | 3.086 sq km |
|-----------------------|---------------------------------|-------------------------------------|--------------------|
| | | Range Land | 0.077 sq km |
| | | Education Facilities | 94 |
| | | Health Facilities | 2 |
| | | Mobile Towers | 1 |
| | | Settlements | 115 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 67.571 km |
| | | Road Network | 247.608 km |
| | | Population | 42813 |
| | | Household | 8169 |
| | | | |
| | | Settlements | 115 |
| | | Agriculture Area | 130.361 sq km |
| | | Bare Area with sparse Natural | 8 113 ca km |
| | | Vegetation | |
| Meteorological | Madium Extrama | Natural Vegetation in Wet Areas | 3.812 sq km |
| Drought | Medium - Extreme | Range Land | 2.23 sq km |
| | ological tt Medium - Extreme | Water Body | 0.926 sq km |
| | | Wet Area | 9.685 sq km |
| | | Population | 34798 |
| | | Household | 6638 |
| | I | | |
| | | Settlements | 58 |
| | | Agriculture Area | 83.954 sq km |
| | | Bare Area with sparse Natural | 8.699 sq km |
| | | Natural Vegetation in Wet Areas | 0.153 sq km |
| Agricultural Drought | Low - High | Range Land | 1.834 sq km |
| | | Water Body | 0.696 sq km |
| | | Wet Area | 2.644 sq km |
| | | Population | 18772 |
| | | Household | 3594 |
| | | | • |
| | | Settlements | 113 |
| | | Population | 34554 |
| | | Household | 6593 |
| Heatwave | Low - High | Agriculture Area | 129.919 sq km |
| | | Pakka Planned Area | 1.567 sq km |
| | | Pakka Unplanned Area | 3.098 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |

| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
|-------------|-----|---|--|
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| DALIDERO | | | |
|---------------------------|------------------|-------------------------------------|--------------------|
| Hazard Type | Risk | Elements at Ris | ik |
| | | Agriculture Area | 44.613 sq km |
| | | Natural Vegetation in Wet Areas | 0.032 sq km |
| | | Pakka Unplanned Area | 1.828 sq km |
| | | Range Land | 0.00033 sq km |
| | | Education Facilities | 46 |
| | | Mobile Towers | 2 |
| Earthquake | Low | Petrol Pumps | 2 |
| | | Settlements | 48 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 12.809 km |
| | | Road Network | 87.995 km |
| | | Population 20755 | 20755 |
| | | Household | 4050 |
| | | | |
| | | Settlements | 48 |
| | | Agriculture Area | 44.711 sq km |
| | | Natural Vegetation in Wet Areas | 1.989 sq km |
| Meteorological Drought | Medium - Extreme | Range Land | 0.013 sq km |
| Diologin | | Wet Area | 3.094 sq km |
| | | Population | 16885 |
| | | Household | 3290 |
| | | | |
| | | Settlements | 1 |
| | | Agriculture Area | 3.956 sq km |
| | | Natural Vegetation in Wet Areas | 0.093 sq km |
| Agricultural Drought | Low | Range Land | 0.01 sq km |
| | | Wet Area | 0.009 sq km |
| | | Population | 228 |
| | | Household | 42 |
| | | | |
| | | Settlements | 48 |
| | | Population | 16766 |
| Heatwave | Low - High | Household | 3267 |
| | | Agriculture Area | 44.582 sq km |
| | | Pakka Unplanned Area | 1.832 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |

| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone |
|-------------|-----|---|
| | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami |
| | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge |

| DAULATPUR | | | |
|------------------------|--|---|--------------|
| Hazard Type | Risk | Elements at Ris | ik |
| | | Agriculture Area | 47.63 sq km |
| | | Natural Vegetation in Wet Areas | 0.004 sq km |
| | | Pakka Planned Area | 0.045 sq km |
| | | Pakka Unplanned Area | 1.724 sq km |
| | | Range Land | 0.025 sq km |
| | | Education Facilities | 39 |
| | | Mobile Towers | 1 |
| Earthquake | LOW | Petrol Pumps | 4 |
| | | Power Plants | 2 |
| | | Settlements | 27 |
| | | Risk Elements at Ris Agriculture Area Natural Vegetation in Wet Areas Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Pakka Unplanned Area Petrol Pumps Power Plants Settlements Irrigation and Drainage Network Road Network Population Household Household Motural Vegetation in Wet Areas Range Land Population Household High Settlements Agriculture Area Natural Vegetation in Wet Areas Range Land Population Household Natural Vegetation in Wet Areas Range Land Population Household Settlements Agriculture Area Range Land Population Household High Settlements Population Household Agriculture Area Pakka Unplanned Area | 10.598 km |
| | | Road Network | 39.662 km |
| | | Population | 27002 |
| | | Household | 5083 |
| | | | |
| | | Settlements | 27 |
| | | Agriculture Area | 47.674 sq km |
| Meteorological | | Natural Vegetation in Wet Areas | 0.162 sq km |
| Drought | Medium - Exfreme | e Agriculture Area 47.674 sq km Natural Vegetation in Wet Areas 0.162 sq km Range Land 0.444 sq km Population 21.925 | 0.444 sq km |
| | | Population | 21935 |
| | | Household | 4128 |
| | · | | |
| | Risk Low Medium - Extreme K Low - High | Settlements | 24 |
| | | Agriculture Area | 54.347 sq km |
| A ani aultural Duamakt | Law Link | Risk Elements at Ris Agriculture Area Natural Vegetation in Wet Areas Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Range Land Education Facilities Mobile Towers Petrol Pumps Power Plants Settlements Irrigation and Drainage Network Road Network Population Household Household Agriculture Area Natural Vegetation in Wet Areas Range Land Population Household Household Settlements Settlements Agriculture Area Natural Vegetation in Wet Areas Range Land Population Household Household Settlements Agriculture Area Range Land Population Household Household Settlements Agriculture Area Range Land Population Household Household Agriculture Area Range Land Population Household Agriculture Area Pakka Planned Area Pakka Planned Area Pakka Unplanned Area </td <td>0.202 sq km</td> | 0.202 sq km |
| Agricultural Drought | Low - High | Range Land | 0.553 sq km |
| | | Population | 21170 |
| | | Household | 3984 |
| | | | |
| | | Settlements | 27 |
| Heatwave | | Population | 21766 |
| | Low High | Household | 4096 |
| | Low - rigii | Agriculture Area | 47.608 sq km |
| | | Pakka Planned Area | 0.045 sq km |
| | | Pakka Unplanned Area | 1.732 sq km |
| | | | |

| | | Agriculture Area | 8.27 sq km | | |
|----------------|-------------|---|-----------------|--|--|
| | | Natural Vegetation in Wet Areas | 0.004 sq km | | |
| Divering Flood | | Agriculture Area8.27 sq kmNatural Vegetation in Wet Areas0.004 sq kmPakka Unplanned Area0.003 sq kmRoad Network3.27 kmPopulation40Household8The UC falls out of vulnerable zone for CycloneThe UC falls out of vulnerable zone for TsunamiThe UC falls out of vulnerable zone for Tsunami | | | |
| Kiverine Flood | Low - Fligh | Agriculture Area8.27 sq kmNatural Vegetation in Wet Areas0.004 sq kmPakka Unplanned Area0.003 sq kmRoad Network3.27 kmPopulation40Household8The UC falls out of vulnerable zone for CycloneThe UC falls out of vulnerable zone for Storm Surge | | | |
| | | Population | 40 | | |
| | | Household | 8 | | |
| | i | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone | | |
| | | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | | | |
| | | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge | | |

| DAUR | | | |
|---------------------------|------------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Ris | sk |
| | | Agriculture Area | 34.526 sq km |
| Hazard Type | | Forest Area | 0.004 sq km |
| | | Pakka Planned Area | 1.643 sq km |
| | | Pakka Unplanned Area | 0.809 sq km |
| | | Range Land | 0.01 sq km |
| | | Ambulance Services | 1 |
| | | Bridges | 5 |
| | | Education Facilities | 38 |
| | | Health Facilities | 4 |
| Earthquake | Low | Mobile Towers | 1 |
| | | Petrol Pumps | 5 |
| | | Police Stations | 1 |
| | | Post Offices2Settlements34 | 2 |
| | | | 34 |
| | | Irrigation and Drainage Network | 20.44 km |
| | | Railway Line | 7.922 km |
| | | Road Network | 57.465 km |
| | | Population | 39110 |
| | | Household | 6963 |
| | | | |
| | | Settlements | 34 |
| | | Agriculture Area | 34.56 sq km |
| | | Forest Area | 0.093 sq km |
| Meteorological Drought | Medium - Extreme | Range Land | 0.062 sq km |
| Dioogini | | Wet Area | 0.005 sq km |
| | | Population | 31545 |
| | | Household | 5615 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 4 |

| | | Agriculture Area | 7.4 sq km |
|----------------|------------|---|--------------------|
| | | Forest Area | 0.116 sq km |
| | | Range Land | 0.077 sq km |
| | | Population | 878 |
| | | Household | 159 |
| | | | · |
| | | Settlements | 32 |
| | | Population | 31358 |
| 11 | Low - High | Household | 5584 |
| Heatwave | | Agriculture Area | 34.511 sq km |
| | | Pakka Planned Area | 1.641 sq km |
| | | Pakka Unplanned Area | 0.811 sq km |
| | · | • | · |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge |

| GHANDTAR | | | | |
|---------------------------|------------------|--|--------------|--|
| Hazard Type | Risk | Elements at Ris | k | |
| | | Agriculture Area | 84.479 sq km | |
| | | Pakka Planned Area | 0.249 sq km | |
| | | Pakka Unplanned Area | 1.74 sq km | |
| | | Range Land | 0.048 sq km | |
| | | Bridges | 2 | |
| | | Education Facilities | 81 | |
| F and a second second | 1 | Mobile Towers | 1 | |
| Earthquake | Low | Petrol Pumps | 3 | |
| | | Settlements | 98 | |
| | | Irrigation and Drainage Network | 47.932 km | |
| | | Railway Line | 13.508 km | |
| | | Road Network | 156.888 km | |
| | | Population | 27285 | |
| | | Household | 5181 | |
| | · | | - | |
| | | Settlements | 98 | |
| | | Agriculture Area | 84.707 sq km | |
| Meteorological Drought | Madium Extrama | Range Land | 2 sq km | |
| | Medium - Extreme | Water Body | 0.384 sq km | |
| | | Wet Area | 5.047 sq km | |
| | | Road Network Population Household Settlements Agriculture Area Range Land Water Body Wet Area Population | 22219 | |

| | | Household | 4216 |
|----------------------|--------------|--|--------------|
| | | | |
| | Low - Medium | Settlements | 36 |
| | | Agriculture Area | 44.144 sq km |
| | | Range Land | 2.466 sq km |
| Agricultural Drought | | Water Body | 0.41 sq km |
| | | Wet Area | 4.34 sq km |
| | | Population | 5000 |
| | | Household | 951 |
| | | | |
| | | Settlements | 97 |
| | Low - High | Population | 21951 |
| Heatwave | | Household | 4169 |
| | | Agriculture Area | 84.413 sq km |
| | | Pakka Planned Area | 0.248 sq km |
| | | Pakka Unplanned Area | 1.741 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| GHULAM HYDER SHAH | | | | |
|--|------------------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 72.443 sq km | |
| Hazard Type Earthquake Meteorological Drought | | Natural Vegetation in Wet Areas | 0.001 sq km | |
| | | Pakka Unplanned Area | 1.913 sq km | |
| Earthquake | Low | Range Land | 0.013 sq km | |
| | | Education Facilities | 57 | |
| | | Health Facilities | 1 | |
| | | Mobile Towers | 1 | |
| | | Power Plants | 1 | |
| | | Settlements | 62 | |
| | | Irrigation and Drainage Network | 38.828 km | |
| | | Road Network | 148.506 km | |
| | | Population | 25640 | |
| | | Household | 4618 | |
| | | | | |
| | | Settlements | 62 | |
| Meteorological | Medium - Extreme | Agriculture Area | 72.571 sq km | |
| 2.009. | | Bare Area with sparse Natural | 4.017 sq km | |

| | | Vegetation | |
|----------------------|--------------|--|--------------|
| | | Natural Vegetation in Wet Areas | 0.013 sq km |
| | | Range Land | 0.142 sq km |
| | | Water Body | 0.228 sq km |
| | | Wet Area | 1.097 sq km |
| | | Population | 20827 |
| | | Household | 3751 |
| | · | | |
| | | Settlements | 12 |
| | | Agriculture Area | 11.381 sq km |
| A minuteral Drought | Law Madium | Bare Area with sparse Natural | 2.929 sq km |
| Agricultural Drought | Low - Medium | Range Land | 0.03 sa km |
| | | Population | 3316 |
| | | Household | 597 |
| | | | |
| | Low - High | Settlements | 57 |
| | | Population | 20627 |
| Heatwave | | Household | 3717 |
| | | Agriculture Area | 72.405 sq km |
| | | Pakka Unplanned Area | 1.918 sq km |
| | 1 | | 1 |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | • | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | • | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| GUHRAM MARI | | | |
|-----------------------|------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake Low | | Agriculture Area | 56.124 sq km |
| | | Forest Area | 0.012 sq km |
| | | Natural Vegetation in Wet Areas | 0.021 sq km |
| | | Pakka Unplanned Area | 1.306 sq km |
| | | Range Land | 0.002 sq km |
| | | Bridges | 1 |
| | LOW | Bus Stops | 1 |
| | | Education Facilities | 18 |
| | | Mobile Towers | 1 |
| | | Settlements | 27 |
| | | Irrigation and Drainage Network | 6.699 km |
| | | Road Network | 43.058 km |

| | | Population | 14826 | |
|--|------------------|---|--------------|--|
| | | Household | 2894 | |
| | | | | |
| | | Settlements | 27 | |
| | Medium - Extreme | Agriculture Area | 56.336 sq km | |
| | | Forest Area | 8.603 sq km | |
| Meteorological | | Natural Vegetation in Wet Areas | 4.706 sq km | |
| Drought | | Range Land | 0.058 sq km | |
| | | Water Body | 2.978 sq km | |
| | | Population | 12031 | |
| | | Household | 2345 | |
| | | - | | |
| | | Settlements | 19 | |
| | | Agriculture Area | 61.565 sq km | |
| | | Forest Area | 10.691 sq km | |
| Agricultural Drought | Low Extromo | Natural Vegetation in Wet Areas | 5.845 sq km | |
| Agricultural Drought | Low - Extreme | Range Land | 0.072 sq km | |
| | | Water Body | 3.7 sq km | |
| | | Population | 8381 | |
| | | Household | 1634 | |
| | | | | |
| | | Settlements | 27 | |
| | | Population | 11974 | |
| Heatwave | Low - High | Household | 2335 | |
| | | Agriculture Area | 56.091 sq km | |
| | | Pakka Unplanned Area | 1.311 sq km | |
| | | | | |
| Agricultural Drought Heatwave Riverine Flood | | Agriculture Area | 30.093 sq km | |
| | | Forest Area | 0.004 sq km | |
| | | Natural Vegetation in Wet Areas | 0.494 sq km | |
| | | Pakka Unplanned Area | 0.252 sq km | |
| Riverine Flood | Low - Extreme | Education Facilities | 2 | |
| | | Settlements | 2 | |
| | | Road Network | 4.193 km | |
| | | Population | 2855 | |
| | | Household | 552 | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami | |
| | 1 | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | | |
| HABERI | | | |
|---------------------------|---|-------------------------------------|--------------------|
| Hazard Type | Risk | Elements at Ri | sk |
| | | Agriculture Area | 99.341 sq km |
| | | Pakka Unplanned Area | 1.433 sq km |
| | | Range Land | 0.004 sq km |
| | | Bridges | 1 |
| | | Education Facilities | 71 |
| | | Health Facilities | 1 |
| Earthquake | Low | Post Offices | 1 |
| | | Settlements | 61 |
| | | Irrigation and Drainage Network | 36.375 km |
| | | Road Network | 154.598 km |
| | | Population | 22449 |
| | | Household | 4228 |
| | I | | |
| | | Settlements | 61 |
| | | Agriculture Area | 99.41 sq km |
| | | Bare Area with sparse Natural | 1.013 cg.km |
| ••• | | Vegetation | |
| Meteorological Drought | Medium - Extreme | Range Land | 0.058 sq km |
| Droogin | | Water Body | 1.249 sq km |
| | | Wet Area | 1.484 sq km |
| | | Population | 18231 |
| | | Household | 3436 |
| | Ι | | |
| | | Settlements 13 | 13 |
| | | Agriculture Area | 28.712 sq km |
| | | Bare Area with sparse Natural | 0.037 sq km |
| | | Range Land | 0.071 sa km |
| Agricultural Drought | pe Risk Elements at Risk Agriculture Area Pakka Unplanned Area Pakka Unplanned Area Range Land Bridges Education Facilities Health Facilities Post Offices Settlements Irrigation and Drainage Network Road Network Population Household Household Settlements Medium - Extreme Settlements Agriculture Area Medium - Extreme Settlements Agriculture Area Vegetation Range Land Water Body Vest Area Population Household It was a figure and Water Body Wet Area Population Household Marea It was - High Settlements Agriculture Area Bare Area with sparse Natural Vegetation Vegetation Range Land Water Body Wet Area Population Household Household It was - High Settlements Population Household Household Household Household It was - High Set | 0.063 sq.km | |
| | | 0.294 sq km | |
| | | Population | 4422 |
| | | Household | 832 |
| | | | 032 |
| | | Settlements | 61 |
| | | Population | 18102 |
| Heatwaye | low - High | Household | 3411 |
| neurwuve | Low right | Agriculture Areg | 99.313 sa km |
| | | Pakka Unplanned Area | 1.441 sa km |
| | I | | 1 |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |
| | | | |

| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
|-------------|-----|---|--|
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| HAMAL FAQIR | | | |
|----------------------|---|---|--------------|
| Hazard Type | Risk | Elements at Ris | sk |
| | | Agriculture Area | 74.198 sq km |
| | | Forest Area | 0.223 sq km |
| | | Pakka Unplanned Area | 2.691 sq km |
| | | Range Land | 0.004 sq km |
| | | Education Facilities | 43 |
| | | Mobile Towers | 2 |
| Earthquake | Low | Petrol Pumps | 3 |
| | | Police Stations | 1 |
| | | Settlements | 37 |
| | | Irrigation and Drainage Network | 10.232 km |
| | gical Medium - Extreme Internation and Draina Road Network Population Household Settlements Agriculture Area Forest Area Range Land Water Body Wet Area Population Household | Road Network | 115.233 km |
| | | Population | 30547 |
| | | Household | 5958 |
| | | | |
| | | Settlements | 37 |
| | | Agriculture Area | 74.32 sq km |
| | | Forest Area | 12.162 sq km |
| Meteorological | | Forest Area12.162 sq kmRange Land0.118 sq kmWater Body0.585 sq kmWet Area1.139 sq km | 0.118 sq km |
| Drought | Medium - Exfreme | | 0.585 sq km |
| | | | 1.139 sq km |
| | | Population | 24854 |
| | | Household | 4848 |
| | | | |
| | | Settlements | 6 |
| | | Agriculture Area | 54.488 sq km |
| | | Elements at Ris Agriculture Area Forest Area Pakka Unplanned Area Range Land Education Facilities Mobile Towers Petrol Pumps Police Stations Settlements Irrigation and Drainage Network Road Network Population Household Agriculture Area Forest Area Range Land Water Body Wet Area Population Household Settlements Agriculture Area Forest Area Range Land Wet Area Population Household Settlements Agriculture Area Forest Area Population Household Settlements Agriculture Area Population Household Agriculture Area Population Household Agriculture Area <t< td=""><td>12.664 sq km</td></t<> | 12.664 sq km |
| Agricultural Drought | Low - Extreme | Water Body | 0.724 sq km |
| | | Wet Area | 0.012 sq km |
| | | Population | 10498 |
| | | Household | 2048 |
| | | | |
| | | Settlements | 37 |
| | | Population | 24723 |
| Heatwave | Low - High | Household | 4824 |
| | | Agriculture Area | 74.17 sq km |
| | | Pakka Unplanned Area | 2.698 sq km |
| | • | • | |
| Riverine Flood | Low - Extreme | Agriculture Area | 37.487 sq km |

| | | Forest Area | 0.002 sq km |
|-------------|-----|---|-------------|
| | | Pakka Unplanned Area | 0.094 sq km |
| | | Education Facilities | 1 |
| | | Settlements | 2 |
| | | Road Network | 13.575 km |
| | | Population | 1063 |
| | | Household | 207 |
| | - | - | · |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | - | - | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| JAM SAHIB | | | |
|-------------|------|---------------------------------|---------------|
| Hazard Type | Risk | Elements at Ris | sk |
| | | Agriculture Area | 73.995 sq km |
| | | Pakka Planned Area | 0.013 sq km |
| | | Pakka Unplanned Area | 2.714 sq km |
| | | Range Land | 0.004 sq km |
| | | Bridges | 5 |
| | | Education Facilities | 55 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 2 |
| | | Settlements | 70 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 49.54 km |
| | | Railway Line | 7.869 km |
| | | Road Network | 162.488 km |
| Earthquake | Low | Population | 37437 |
| | | Household | 6743 |
| | | Agriculture Area | 119.114 sq km |
| | | Natural Vegetation in Wet Areas | 0.011 sq km |
| | | Pakka Unplanned Area | 1.834 sq km |
| | | Range Land | 0.049 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 79 |
| | | Health Facilities | 3 |
| | | Settlements | 90 |
| | | Irrigation and Drainage Network | 70.506 km |
| | | Road Network | 227.67 km |
| | | Population | 26220 |
| | | Household | 4847 |
| | | | |

| | | Settlements | 70 |
|---------------------------|------------------|---|--------------------|
| | | Agriculture Area | 74.069 sq km |
| | | | Range Land |
| Meteorological Drought | Medium - Extreme | Water Body | 0.021 sq km |
| Diougin | | Wet Area | 2.015 sq km |
| | | Population | 30415 |
| | | Household | 5478 |
| | · | | |
| | | Settlements | 1 |
| | | Agriculture Area | 1.422 sq km |
| Agricultural Drought | Law | Water Body | 0.025 sq km |
| Agricultural Drought | LOW | Wet Area | 0.007 sq km |
| | | Population | 170 |
| | | Household | 30 |
| | | | |
| | | Settlements | 69 |
| | | Population | 30213 |
| He advisor to | Laure Litada | Household | 5444 |
| neatwave | Low - High | Agriculture Area | 73.965 sq km |
| | | Pakka Planned Area | 0.013 sq km |
| | | Pakka Unplanned Area | 2.722 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | 1 | - | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge |

| JAMAL SHAH | | | | |
|-------------------|------|---------------------------------|---------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 119.114 sq km | |
| | | Natural Vegetation in Wet Areas | 0.011 sq km | |
| | | Pakka Unplanned Area | 1.834 sq km | |
| | | Range Land | 0.049 sq km | |
| | | Bridges | 2 | |
| E and have a la a | 1 | Education Facilities | 79 | |
| Earthquake | LOW | Health Facilities | 3 | |
| | | Settlements | 90 | |
| | | Irrigation and Drainage Network | 70.506 km | |
| | | Road Network | 227.67 km | |
| | | Population | 26220 | |
| | | Household | 4847 | |

| | | Settlements | 90 | |
|----------------------|------------------|---|----------------------------------|--|
| | | Agriculture Area | 119.417 sq km | |
| | | Bare Area with sparse Natural Vegetation | 9.721 sq km | |
| Meteorological | | Natural Vegetation in Wet Areas | 0.355 sq km | |
| Drought | Medium - Extreme | Range Land | 1.739 sq km | |
| | | Water Body | 6.396 sq km | |
| | | Wet Area | 6.483 sq km | |
| | | Population | 21284 | |
| | | Household | 3929 | |
| | · | - | · | |
| | | Settlements | 16 | |
| | | Agriculture Area | 35.669 sq km | |
| | | Bare Area with sparse Natural Vegetation | 4.02 sq km | |
| | | Natural Vegetation in Wet Areas | 0.303 sq km | |
| Agricultural Drought | Low - High | Range Land | 1.878 sq km | |
| | | Water Body | 3.258 sq km | |
| | | Wet Area | 3.258 sq km 3.132 sq km 2300 | |
| | | Population | | |
| | | Household | 424 | |
| | | | | |
| | | Settlements | 88 | |
| | | Population | 21145 | |
| Heatwave | Low - High | Household | 3907 | |
| | | Agriculture Area | 119.015 sq km | |
| | | Pakka Unplanned Area | 1.841 sq km | |
| | | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami | |
| | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | | |

| JHORO KHAN SHAR | | | | |
|-----------------|-----------------------------------|---------------------------------|---------------|--|
| Hazard Type | Hazard Type Risk Elements at Risk | | | |
| Earthquake | | Agriculture Area | 110.541 sq km | |
| | | Forest Area | 0.013 sq km | |
| | Low | Kachcha Area | 0.024 sq km | |
| | | Natural Vegetation in Wet Areas | 0.282 sq km | |
| | | Pakka Unplanned Area | 3.187 sq km | |

| | | Range Land | 0.123 sq km |
|---------------------------|------------------|--|--------------------|
| | | Bridges | 5 |
| | | Education Facilities | 56 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 4 |
| | | Settlements | 90 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 41.537 km |
| | | Road Network | 229.557 km |
| | | Population | 44743 |
| | | Household | 8061 |
| | | | |
| | | Settlements | 90 |
| | | Agriculture Area | 111.398 sq km |
| | | Bare Area with sparse Natural | 156 9 ag lum |
| | | Vegetation | 400.8 sq km |
| | | Forest Area | 1.837 sq km |
| Meteorological Drawaht | Medium - Extreme | Natural Vegetation in Wet Areas | 10.987 sq km |
| Meteorological Drought | | Range Land | 7.4 sq km |
| | | Kange Land7.4 sq kmWater Body14.932 st | 14.932 sq km |
| | | Wet Area | 14.711 sq km |
| | | Population | 36400 |
| | | Household | 6554 |
| | | | |
| | | Settlements | 39 |
| | | Agriculture Area | 66.31 sq km |
| | | Bare Area with sparse Natural | 563.216 sa km |
| | | Vegetation | |
| | | Forest Area | 2.29 sq km |
| Agricultural Drought | Low - Extreme | Natural vegetation in vvet Areas | 12.221 sq km |
| | | Range Land | 8.855 sq km |
| | | Water Body | 18.591 sq km |
| | | Wet Area | 16.189 sq km |
| | | Population | 13192 |
| | | Household | 2377 |
| | Γ | | I |
| | | Settlements | 85 |
| | | Population | 35984 |
| Heatwaye | low - High | Household | 6479 |
| TIGNITTATG | | Agriculture Area | 110.314 sq km |
| | | Kachcha Area | 0.025 sq km |
| | | Pakka Unplanned Area | 3.189 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | • | | |

| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone |
|-------------|-----|---|
| | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami |
| | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge |

| KARAM JAMALI | | | |
|---------------------------|------------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Ris | sk |
| | | Agriculture Area | 65.275 sq km |
| | | Forest Area | 0.012 sq km |
| | | Natural Vegetation in Wet Areas | 0.061 sq km |
| | | Pakka Planned Area | 0.059 sq km |
| | | Pakka Unplanned Area | 2.785 sq km |
| | | Range Land | 0.003 sq km |
| | | Bridges | 1 |
| Earthquake | Low | Education Facilities | 119 |
| | | Health Facilities | 2 |
| | | Petrol Pumps | 2 |
| | | Settlements | 90 |
| | | Irrigation and Drainage Network | 22.444 km |
| | | Road Network | 120.747 km |
| | | Population | 32320 |
| | | Household | 6245 |
| | | | |
| | | Settlements | 90 |
| | | Agriculture Area | 65.407 sq km |
| Meteorological Drought | | Forest Area | 0.128 sq km |
| | | Natural Vegetation in Wet Areas | 1.41 sq km |
| | Medium - Extreme | Range Land | 0.091 sq km |
| Droogin | | Water Body | 0.121 sq km |
| | | Wet Area | 1.886 sq km |
| | | Population | 26439 |
| | | Household | 5113 |
| | | - | - |
| | | Settlements | 16 |
| | | Agriculture Area | 21.586 sq km |
| | | Forest Area | 0.071 sq km |
| Agricultural Drought | Low - Medium | Range Land | 0.109 sq km |
| | | Wet Area | 0.713 sq km |
| | | Population | 3106 |
| | | Household | 564 |
| | | | |
| Heatwaye | Low - Hich | Settlements | 90 |
| пеатwave | Low - nign | Population | 26169 |

| | | Household | 5059 |
|-----------------------|-----|--|--------------|
| | | Agriculture Area | 65.226 sq km |
| | | Pakka Planned Area | 0.059 sq km |
| | | Pakka Unplanned Area | 2.796 sq km |
| | ÷ | | · |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| KHADHAR | | | |
|----------------------|------------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Ris | sk |
| | | Agriculture Area | 65.386 sq km |
| | | Forest Area | 0.004 sq km |
| | | Pakka Planned Area | 0.315 sq km |
| | | Pakka Unplanned Area | 2.743 sq km |
| | | Range Land | 0.027 sq km |
| | | Bridges | 6 |
| | | Education Facilities | 95 |
| | | Health Facilities | 2 |
| Farthauako | low | Industries | 1 |
| Earnquake | LOW | Mobile Towers | 1 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 2 |
| | | Settlements | 87 |
| | | Irrigation and Drainage Network | 41.655 km |
| | | Railway Line | 1.717 km |
| | | Road Network | 125.304 km |
| | | Population | 32241 |
| | | Household | 6251 |
| | | | |
| | | Settlements | 87 |
| | | Agriculture Area | 65.473 sq km |
| | | Forest Area | 0.183 sq km |
| Meteorological | Madium Extrama | Range Land | 2.123 sq km |
| Drought | Medium - Extreme | Water Body | 0.086 sq km |
| | | Wet Area | 0.321 sq km |
| | | Population | 26289 |
| | | Household | 5095 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 12 |

| | | Agriculture Area | 12.419 sq km |
|-----------------------|-------------|---|--------------------|
| | | Forest Area | 0.15 sq km |
| | | Range Land | 2.614 sq km |
| | | Water Body | 0.04 sq km |
| | | Wet Area | 0.002 sq km |
| | | Population | 1699 |
| | | Household | 312 |
| | | | |
| | | Settlements | 86 |
| | | Population | 26112 |
| Homburgurg | Low High | Household | 5063 |
| neatwave | Low - Fligh | Agriculture Area | 65.348 sq km |
| | | Pakka Planned Area | 0.317 sq km |
| | | Pakka Unplanned Area | 2.758 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| KHAIR SHAH | | | | |
|-------------|------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 59.351 sq km | |
| | | Pakka Planned Area | 8.369 sq km | |
| | | Pakka Unplanned Area | 3.983 sq km | |
| | | Range Land | 0.065 sq km | |
| | | Ambulance Services | 1 | |
| | | Bridges | 8 | |
| | | Bus Stops | 3 | |
| | | Education Facilities | 156 | |
| | | Fire Stations | 1 | |
| Earthquake | Low | Grid Stations | 2 | |
| | | Health Facilities | 15 | |
| | | Industries | 1 | |
| | | Mobile Towers | 27 | |
| | | Petrol Pumps | 35 | |
| | | Police Stations | 4 | |
| | | Post Offices | 5 | |
| | | Settlements | 109 | |
| | | Tourist Places | 4 | |
| | | Irrigation and Drainage Network | 41.234 km | |

| | | Railway Line | 16.501 km |
|---------------------------|------------------|---|--------------------|
| | | Road Network | 127.806 km |
| | | Population | 289975 |
| | | Household | 49776 |
| | | | |
| | | Settlements | 108 |
| | | Agriculture Area | 59.525 sq km |
| | | Range Land | 1.183 sq km |
| Meteorological Drought | Medium - Extreme | Water Body | 0.326 sq km |
| Droogin | | Wet Area | 0.454 sq km |
| | | Population | 234148 |
| | | Household | 40199 |
| | | | |
| | | Settlements | 35 |
| | | Agriculture Area | 26.124 sq km |
| | Low - High | Range Land | 1.46 sq km |
| Agricultural Drought | | Water Body | 0.295 sq km |
| | | Wet Area | 0.565 sq km |
| | | Population | 74661 |
| | | Household | 12785 |
| | | - | |
| | | Settlements | 103 |
| | | Population | 233431 |
| Heatwaye | Low High | Household | 40073 |
| ileuiwuve | Low - High | Agriculture Area | 59.286 sq km |
| | | Pakka Planned Area | 8.367 sq km |
| | | Pakka Unplanned Area | 3.989 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | - | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| KHAR | | | |
|-----------------------------------|-----|----------------------|--------------|
| Hazard Type Risk Elements at Risk | | | at Risk |
| Earthquake | Low | Agriculture Area | 98.816 sq km |
| | | Pakka Planned Area | 0.114 sq km |
| | | Pakka Unplanned Area | 2.959 sq km |
| | | Range Land | 0.23 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 79 |

| | | Health Facilities | 1 | |
|----------------------|------------------|---|--------------------|--|
| | | Mobile Towers | 2 | |
| | | Petrol Pumps | 5 | |
| | | Power Plants | 4 | |
| | | Settlements | 78 | |
| | | Irrigation and Drainage Network | 30.042 km | |
| | | Road Network | 138.312 km | |
| | | Population | 46346 | |
| | | Household | 8727 | |
| | • | - | | |
| | | Settlements | 78 | |
| | | Agriculture Area | 99.03 sq km | |
| | | Bare Area with sparse Natural Vegetation | 0.755 sq km | |
| Meteorological | Medium - Extreme | Range Land | 3.86 sq km | |
| Drought | | Water Body | 0.021 sq km | |
| | | Wet Area | 4.383 sq km | |
| | | Population | 37610 | |
| | | Household | 7084 | |
| | | | | |
| | | Settlements | 56 | |
| | | Agriculture Area | 82.938 sq km | |
| | Low - High | Bare Area with sparse Natural Vegetation | 0.942 sq km | |
| Agricultural Drought | | Range Land | 4.766 sq km | |
| | | Water Body | 0.026 sq km | |
| | | Wet Area | 3.483 sq km | |
| | | Population | 29093 | |
| | | Household | 5480 | |
| | 1 | | 1 | |
| | | Settlements | 77 | |
| | | Population | 37279 | |
| Heatwaye | low - High | Household | 7022 | |
| | 20.0 mgn | Agriculture Area | 98.736 sq km | |
| | | Pakka Planned Area | 0.114 sq km | |
| | | Pakka Unplanned Area | 2.971 sq km | |
| | 1 | | | |
| Riverine Flood | Nil | The UC talls out of vulnerable zone | tor Riverine Flood | |
| | 1 | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | | |
| | 1 | | <u> </u> | |
| Tsunami | Nil | The UC talls out ot vulnerable zone for Tsunami | | |
| | 1 | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | | |

| KUMBLEEMA | | | | |
|---------------------------|---|---|--------------------|--|
| Hazard Type | Risk | Elements at Ris | ik | |
| | | Agriculture Area | 46.228 sq km | |
| | | Forest Area | 0.02 sq km | |
| | | Natural Vegetation in Wet Areas | 0.176 sq km | |
| | | Pakka Unplanned Area | 3.17 sq km | |
| | | Range Land | 0.028 sq km | |
| | | Education Facilities | 75 | |
| | | Health Facilities | 1 | |
| Earthquake | LOW | Mobile Towers | 2 | |
| | | Petrol Pumps | 3 | |
| | | Settlements | 60 | |
| | | Irrigation and Drainage Network | 16.873 km | |
| | | Road Network | 97.707 km | |
| | | Population | 35980 | |
| | | Household | 7013 | |
| | l | | | |
| | | Settlements | 59 | |
| | | Agriculture Area | 46.363 sq km | |
| | | Forest Area | 0.174 sq km | |
| | Medium - Extreme | Natural Vegetation in Wet Areas | 3.25 sq km | |
| Meteorological Drought | | Range Land | 0.623 sq km | |
| Droogin | | Water Body | 1.842 sq km | |
| | | Wet Area | 0.392 sq km | |
| | | Population | 29420 | |
| | | Household | 5738 | |
| | | • | | |
| | | Settlements | 58 | |
| | | Population | 29182 | |
| Heatwave | Low - High | Household | 5687 | |
| | | Agriculture Area | 46.184 sq km | |
| | | Pakka Unplanned Area | 3.186 sq km | |
| | | - | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | | |
| | | | | |
| Storm Surge | Nil The UC falls out of vulnerable zone for Storm Surge | | | |
| | | | | |
| Agricultural Drought | Nil | The UC falls out of vulnerable zone | for Agricultural | |
| | | Drought | | |

| | MANHARO | | | |
|---------------------------|------------------|---|----------------------|--|
| Hazard Type | Risk | Elements at | Risk | |
| | | Agriculture Area | 18.957 sq km | |
| | | Pakka Unplanned Area | 0.336 sq km | |
| | | Range Land | 0.028 sq km | |
| | | Education Facilities | 20 | |
| Earthquake | Low | Settlements | 12 | |
| | | Irrigation and Drainage Network | 13.623 km | |
| | | Road Network | 51.308 km | |
| | | Population | 5264 | |
| | | Household | 991 | |
| | | | | |
| | | Settlements | 12 | |
| | | Agriculture Area | 19.055 sq km | |
| | | Bare Area with sparse Natural | 0.346 sa km | |
| | | Vegetation | | |
| Meteorological Drought | Medium - Extreme | Areas | 0.021 sq km | |
| 2 | | Range Land | 1.142 sq km | |
| | | Wet Area | 2.436 sq km | |
| | | Population | 4258 | |
| | | Household | 800 | |
| | | | | |
| | | Agriculture Area | 1.87 sq km | |
| | Low | Bare Area with sparse Natural Vegetation | 0.002 sq km | |
| | | Natural Vegetation in Wet | 0.022 sa km | |
| Agricultural | | Areas | | |
| Broogin | | Range Land | 0.325 sq km | |
| | | Wet Area | 0.014 sq km | |
| | | Population | 18 | |
| | | Household | 3 | |
| | | Sattlemente | 10 | |
| | | Settlements Deputation | 12 | |
| He attacks | Law Utah | Population | 422/ | |
| neatwave | Low - High | | 790 18922 sa km | |
| | | Agriculture Ared | 0.337 sq.km | |
| | | Pakka Unplanned Area | 0.007 39 km | |
| Rivering Flood | Nil | The UC falls out of vulnerable zon | e for Riverine Flood | |
| RIVEINE FIUUU | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zon | e for Tsunami | |
| | | | | |
| Storm Surae | Nil | The UC falls out of vulnerable zon | e for Storm Surae | |
| | 1 | | | |

| MARVI | | | |
|----------------|------------------|---------------------------------|---------------|
| Hazard Type | Risk | Elements at R | lisk |
| | | Agriculture Area | 107.936 sq km |
| | | Forest Area | 0.027 sq km |
| | | Natural Vegetation in Wet Areas | 0.07 sq km |
| | | Pakka Planned Area | 0.192 sq km |
| | | Pakka Unplanned Area | 1.137 sq km |
| Earthquake | Low | Education Facilities | 25 |
| | | Settlements | 23 |
| | | Irrigation and Drainage Network | 2.986 km |
| | | Road Network | 53.138 km |
| | | Population | 15082 |
| | | Household | 2942 |
| | | • | |
| | | Settlements | 23 |
| | | Agriculture Area | 108.086 sq km |
| | | Forest Area | 1.547 sq km |
| Meteorological | | Natural Vegetation in Wet Areas | 6.422 sq km |
| Drought | Medium - Extreme | Water Body | 0.078 sq km |
| | | Wet Area | 1.129 sq km |
| | | Population | 12298 |
| | | Household | 2399 |
| | | | |
| | Low - Extreme | Settlements | 12 |
| | | Agriculture Area | 124.321 sq km |
| | | Forest Area | 1.916 sq km |
| Agricultural | | Natural Vegetation in Wet Areas | 7.925 sq km |
| Drought | | Water Body | 0.096 sq km |
| | | Wet Area | 0.555 sq km |
| | | Population | 8230 |
| | | Household | 1603 |
| | | | |
| | | Settlements | 22 |
| | | Population | 12194 |
| Hoghwayo | Low High | Household | 2378 |
| neurwuve | Low - High | Agriculture Area | 107.915 sq km |
| | | Pakka Planned Area | 0.192 sq km |
| | | Pakka Unplanned Area | 1.138 sq km |
| | | | |
| | | Agriculture Area | 86.386 sq km |
| | | Forest Area | 0.229 sq km |
| Piverino Elace | Low Extromo | Natural Vegetation in Wet Areas | 2.142 sq km |
| RIVEINE FIUOD | LOW - EXITEME | Pakka Unplanned Area | 0.005 sq km |
| | | Settlements | 1 |
| | | Road Network | 8.503 km |

| | | Population | 54 |
|-------------|-----|---|----|
| | | Household | 10 |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | • | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| MEHRABPUR | | | |
|-------------------------|------------------|--|--------------|
| Hazard Type | Risk | Elements at | Risk |
| | | Agriculture Area | 46.046 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.049 sq km |
| | | Pakka Unplanned Area | 1.655 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 34 |
| Earthquake | Low | Health Facilities | 2 |
| • | | Mobile Towers | 2 |
| | | Petrol Pumps | 1 |
| | | Settlements | 28 |
| | | Irrigation and Drainage Network | 13.063 km |
| | | Road Network | 82.954 km |
| | | Population | 18785 |
| | | Household | 3669 |
| | · | | |
| | Medium - Extreme | Settlements | 28 |
| | | Agriculture Area | 46.178 sq km |
| | | Bare Area with sparse Natural Vegetation | 1.108 sq km |
| Matagualaniani | | Forest Area | 0.029 sq km |
| Drought | | Natural Vegetation in Wet Areas | 8.214 sq km |
| | | Water Body | 1.062 sq km |
| | | Wet Area | 0.228 sq km |
| | | Population | 15286 |
| | | Household | 2979 |
| | | | |
| | | Settlements | 3 |
| | | Agriculture Area | 23.732 sq km |
| Agricultural Drought | Low - High | Bare Area with sparse Natural Vegetation | 1.373 sq km |
| | | Natural Vegetation in Wet Areas | 9.638 sq km |
| | | Water Body | 0.91 sq km |

| | | Wet Area | 0.192 sq km |
|----------------|---------------|---|----------------------|
| | | Population | 3400 |
| | | Household | 662 |
| | L. | | · |
| | | Settlements | 28 |
| | | Population | 15192 |
| Heatwave | Low - High | Household | 2967 |
| | | Agriculture Area | 46.019 sq km |
| | | Pakka Unplanned Area | 1.66 sq km |
| | | | |
| | Low - Extreme | Agriculture Area | 16.795 sq km |
| | | Natural Vegetation in Wet Areas | 5.389 sq km |
| | | Pakka Unplanned Area | 0.003 sq km |
| Riverine Flood | | Education Facilities | 1 |
| | | Road Network | 0.066 km |
| | | Population | 33 |
| | | Household | 6 |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable z | zone for Cyclone |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable z | zone for Storm Surge |

| MIRZABAGH | | | | |
|---------------------------|------------------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 51.815 sq km | |
| | | Pakka Planned Area | 0.376 sq km | |
| | | Pakka Unplanned Area | 1.864 sq km | |
| | | Range Land | 0.017 sq km | |
| | | Education Facilities | 37 | |
| Earthquake | Low | Petrol Pumps | 1 | |
| | | Settlements | 65 | |
| | | Irrigation and Drainage Network | 5.242 km | |
| | | Road Network | 113.427 km | |
| | | Population | 30330 | |
| | | Household | 5785 | |
| | | | | |
| | | Settlements | 65 | |
| | | Agriculture Area | 51.862 sq km | |
| Meteorological Drought | Medium - Extreme | Range Land | 0.331 sq km | |
| Diologin | | Water Body | 0.103 sq km | |
| | | Wet Area | 0.016 sq km | |

| | | Population | 24649 |
|----------------------|--------------|---|-------------------------|
| | | Household | 4705 |
| | | | |
| | | Settlements | 3 |
| | | Agriculture Area | 4.898 sq km |
| | | Range Land | 0.402 sq km |
| Agricultural Drought | Low - Medium | Water Body | 0.125 sq km |
| | | Wet Area | 0.001 sq km |
| | | Population | 2158 |
| | | Household | 420 |
| | | | |
| | | Settlements | 65 |
| | | Population | 24478 |
| Hantura | Low High | Household | 4669 |
| neatwave | Low - High | Agriculture Area | 51.792 sq km |
| | | Pakka Planned Area | 0.377 sq km |
| | | Pakka Unplanned Area | 1.871 sq km |
| | | · | · |
| Riverine Flood | Nil | The UC falls out of vulnerable z | zone for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable z | zone for Cyclone |
| | | <u> </u> | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| NAWABSHAH -4 | | | |
|---------------|------|---------------------------------|-------------|
| Hazard Type | Risk | Elements at Risk | |
| | | Agriculture Area | 7.119 sq km |
| | | Forest Area | 0.004 sq km |
| | | Pakka Planned Area | 1.935 sq km |
| | | Pakka Unplanned Area | 0.947 sq km |
| | | Range Land | 0.031 sq km |
| | | Bus Stops | 2 |
| | | Education Facilities | 23 |
| Eauth an also | Law | Grid Stations | 1 |
| Еаттяциаке | LOW | Health Facilities | 2 |
| | | Industries | 1 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 1 |
| | | Settlements | 25 |
| | | Irrigation and Drainage Network | 0.392 km |
| | | Railway Line | 1.551 km |
| | | Road Network | 17.727 km |

| | | Population | 29973 | |
|----------------------|------------------|---|----------------------|--|
| | | Household | 5264 | |
| | • | - | | |
| | | Settlements | 25 | |
| | | Agriculture Area | 7.16 sq km | |
| | | Forest Area | 0.332 sq km | |
| Meteorological | Maalium Eutroma | Range Land | 1.32 sq km | |
| Drought | Medium - Extreme | Water Body | 0.147 sq km | |
| | | Wet Area | 0.206 sq km | |
| | | Population | 24172 | |
| | | Household | 4245 | |
| | | | | |
| | | Settlements | 11 | |
| | | Agriculture Area | 1.417 sq km | |
| | | Forest Area | 0.411 sq km | |
| Anniaultural Drought | Low High | Range Land | 1.629 sq km | |
| Agricultural Drought | Low - Fign | Water Body | 0.18 sq km | |
| | | Wet Area | 0.051 sq km | |
| | | Population | 16663 | |
| | | Household | 2925 | |
| | | | | |
| | | Settlements | 22 | |
| | | Population | 24145 | |
| Hoghwayo | Low High | Household | 4240 | |
| nediwave | Low - High | Agriculture Area | 7.106 sq km | |
| | | Pakka Planned Area | 1.934 sq km | |
| | | Pakka Unplanned Area | 0.949 sq km | |
| | | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zon | e for Riverine Flood | |
| | | - | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zon | e for Tsunami | |
| | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | | |

| OBHARISAWARI | | | |
|--------------|------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| | Low | Agriculture Area | 72.655 sq km |
| | | Forest Area | 0.003 sq km |
| Fauthauako | | Natural Vegetation in Wet Areas | 0.001 sq km |
| εαπηφυακέ | | Pakka Unplanned Area | 4.618 sq km |
| | | Range Land | 0.019 sq km |
| | | Bridges | 3 |

| | | Education Facilities | 91 |
|----------------------|------------------|---|--------------------|
| | | Health Facilities | 1 |
| | | Settlements | 103 |
| | | Irrigation and Drainage Network | 34.736 km |
| | | Road Network | 103.997 km |
| | | Population | 61922 |
| | | Household | 11159 |
| | | - | |
| | | Settlements | 103 |
| | | Agriculture Area | 73.094 sq km |
| | | Bare Area with sparse Natural Vegetation | 34.951 sq km |
| | | Forest Area | 0.09 sq km |
| Meteorological | Medium - Extreme | Natural Vegetation in Wet Areas | 0.033 sq km |
| Drought | | Range Land | 0.363 sq km |
| | | Water Body | 3.047 sq km |
| | | Wet Area | 1.141 sq km |
| | | Population | 50452 |
| | | Household | 9088 |
| | - | | |
| | Low - High | Settlements | 50 |
| | | Agriculture Area | 49.671 sq km |
| | | Bare Area with sparse Natural Vegetation | 38.8 sq km |
| | | Forest Area | 0.112 sq km |
| Agricultural Drought | | Natural Vegetation in Wet Areas | 0.042 sq km |
| | | Range Land | 0.448 sq km |
| | | Water Body | 3.798 sq km |
| | | Wet Area | 1.422 sq km |
| | | Population | 20278 |
| | | Household | 3653 |
| | 1 | | Т |
| | | Settlements | 100 |
| | | Population | 49832 |
| Heatwave | Low - High | Household | 8978 |
| | | Agriculture Area | 72.556 sq km |
| | | Pakka Unplanned Area | 4.634 sq km |
| | 1 | | <u> </u> |
| Riverine Flood | Nil | Ine UC talls out ot vulnerable zone | tor Riverine Flood |
| | | | |
| Cyclone | Nil | Ine UC falls out of vulnerable zone | tor Cyclone |
| | | | <u>(</u> <u> </u> |
| Tsunami | Nil | Ine UC talls out of vulnerable zone | tor Isunami |
| | 1 | | |
| Storm Surge | Nil | The UC talls out of vulnerable zone | tor Storm Surge |

| PIR ZAKI | | | |
|----------------------|------------------|-------------------------------------|--------------------|
| Hazard Type | Risk | Elements at Ri | sk |
| | | Agriculture Area | 42.945 sq km |
| | | Forest Area | 0.051 sq km |
| | | Pakka Planned Area | 1.694 sq km |
| | | Pakka Unplanned Area | 1.728 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 73 |
| | | Grid Stations | 1 |
| | | Health Facilities | 4 |
| Earthquake | Low | Mobile Towers | 7 |
| | | Petrol Pumps | 17 |
| | | Settlements | 52 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 17.727 km |
| | | Road Network | 133.162 km |
| | | Population | 54568 |
| | | Household | 10604 |
| | | | |
| | | Settlements | 52 |
| | | Agriculture Area | 43.06 sq km |
| Meteorological | Medium - Extreme | Forest Area | 1.941 sq km |
| Drought | | Wet Area | 6.022 sq km |
| | | Population | 44275 |
| | | Household | 8604 |
| | | | |
| | | Settlements | 1 |
| | | Agriculture Area | 1.401 sq km |
| | | Forest Area | 2.072 sq km |
| Agricultural Drought | Low | Wet Area | 0.409 sq km |
| | | Population | 328 |
| | | Household | 62 |
| | J | 1 | |
| | | Settlements | 51 |
| | | Population | 44034 |
| | | Household | 8556 |
| Heatwave | Low - High | Agriculture Area | 42.909 sq km |
| | | Pakka Planned Area | 1.694 sq km |
| | | Pakka Unplanned Area | 1.731 sq km |
| | 1 | · · | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | 1 | 1 | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| - | 1 | 1 | |

| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
|-------------|-----|---|--|
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| QAZI AHMED 01 | | | | | | |
|---------------------------|------------------|---------------------------------|--------------|--|--|--|
| Hazard Type | Risk | Elements at | Risk | | | |
| | | Agriculture Area | 26.815 sq km | | | |
| | | Forest Area | 0.021 sq km | | | |
| | | Pakka Planned Area | 2.202 sq km | | | |
| | | Pakka Unplanned Area | 0.584 sq km | | | |
| | | Range Land | 0.008 sq km | | | |
| | | Ambulance Services | 1 | | | |
| | | Education Facilities | 39 | | | |
| | | Grid Stations | 1 | | | |
| | | Health Facilities | 5 | | | |
| Earthquake | Low | Industries | 2 | | | |
| | | Mobile Towers | 7 | | | |
| | | Petrol Pumps | 6 | | | |
| | | Police Stations | 1 | | | |
| | | Settlements | 31 | | | |
| | | Tourist Places | 2 | | | |
| | | Irrigation and Drainage Network | 7.28 km | | | |
| | | Road Network | 57.521 km | | | |
| | | Population | 35752 | | | |
| | | Household | 6666 | | | |
| | | | | | | |
| | Medium - Extreme | Settlements | 31 | | | |
| | | Agriculture Area | 26.86 sq km | | | |
| | | Forest Area | 0.248 sq km | | | |
| Meteorological Drought | | Range Land | 0.231 sq km | | | |
| Droogin | | Wet Area | 0.034 sq km | | | |
| | | Population | 28949 | | | |
| | | Household | 5400 | | | |
| | | | | | | |
| | | Agriculture Area | 0.008 sq km | | | |
| | | Forest Area | 0.284 sq km | | | |
| Agricultural | 1 e.u. | Range Land | 0.279 sq km | | | |
| Drought | LOW | Wet Area | 0.002 sq km | | | |
| | | Population | 195 | | | |
| | | Household | 37 | | | |
| | | • | | | | |
| | | Settlements | 30 | | | |
| Heatwave | Low - High | Population | 28795 | | | |
| | | Household | 5370 | | | |

| | | Agriculture Area | 26.796 sq km | |
|-----------------------|-----|--------------------------------|---|--|
| | | Pakka Planned Area | 2.204 sq km | |
| | | Pakka Unplanned Area | 0.587 sq km | |
| | · | | · | |
| Riverine Flood | Nil | The UC falls out of vulnerable | e zone for Riverine Flood | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Cyclone | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Tsunami | |
| | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable | The UC falls out of vulnerable zone for Storm Surge | |

| | QAZI AHMED 02 | | | |
|---------------------------|------------------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Ri | sk | |
| | | Agriculture Area | 44.107 sq km | |
| | | Pakka Unplanned Area | 1.74 sq km | |
| | | Range Land | 0.057 sq km | |
| | | Education Facilities | 21 | |
| E anthe annulse | 1 | Police Stations | 1 | |
| саппараке | LOW | Settlements | 26 | |
| | | Irrigation and Drainage Network | 7.139 km | |
| | | Road Network | 60.529 km | |
| | | Population | 22330 | |
| | | Household | 4292 | |
| | | | | |
| | | Settlements | 26 | |
| | Medium - Extreme | Agriculture Area | 44.194 sq km | |
| | | Forest Area | 0.003 sq km | |
| Meteorological Drought | | Range Land | 0.916 sq km | |
| Dioogini | | Water Body | 1.896 sq km | |
| | | Population | 18114 | |
| | | Household | 3483 | |
| | | | | |
| | | Settlements | 16 | |
| | | Agriculture Area | 39.218 sq km | |
| | | Forest Area | 0.003 sq km | |
| Agricultural Drought | Low - High | Range Land | 1.137 sq km | |
| | | Water Body | 2.356 sq km | |
| | | Population | 12055 | |
| | | Household | 2339 | |
| | | | | |
| | | Settlements | 24 | |
| Heatwave | Low - High | Population | 18021 | |
| | | Household | 3466 | |

| | | Agriculture Area | 44.082 sq km | |
|----------------|---------------|---|--------------|--|
| | | Pakka Unplanned Area | 1.745 sq km | |
| | | | | |
| | | Agriculture Area | 8.696 sq km | |
| | | Pakka Unplanned Area | 0.117 sq km | |
| | | Range Land | 0.003 sq km | |
| Riverine Flood | Low - Extreme | Education Facilities | 2 | |
| Riverine rivou | | Settlements | 1 | |
| | | Road Network | 2.728 km | |
| | | Population | 1331 | |
| | | Household | 259 | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone | |
| | | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | | |
| | | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | | |

| RAIS MOHAMMAD I K. BROHI | | | | |
|--------------------------|------------------|--|--------------|--|
| Hazard Type | Risk | Elements at Ri | sk | |
| | | Agriculture Area | 98.252 sq km | |
| | | Forest Area | 0.007 sq km | |
| | | Pakka Planned Area | 0.136 sq km | |
| | | Pakka Unplanned Area | 1.833 sq km | |
| | | Range Land | 0.022 sq km | |
| | | Bridges | 2 | |
| | | Education Facilities | 78 | |
| Farthauako | low | Health Facilities | 1 | |
| Earnquake | Low | Mobile Towers | 2 | |
| | | Police Stations | 1 | |
| | | Settlements | 84 | |
| | | Irrigation and Drainage Network | 34.302 km | |
| | | Railway Line | 6.141 km | |
| | | Road Network | 120.261 km | |
| | | Population | 26394 | |
| | | Household | 4761 | |
| | | | | |
| | | Settlements | 84 | |
| | | Agriculture Area | 98.432 sq km | |
| Meteorological | Medium - Extreme | Bare Area with sparse Natural Vegetation | 0.473 sq km | |
| prought | | Forest Area | 0.096 sq km | |
| | | Range Land | 0.573 sq km | |
| | | Wet Area | 6.38 sq km | |

| | | Population | 21511 |
|----------------------|--------------|---|--------------------|
| | | Household | 3877 |
| | I | | |
| | | Settlements | 22 |
| | | Agriculture Area | 36.087 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.001 sq km |
| Agricultural Drought | Low - Medium | Forest Area | 0.116 sq km |
| | | Range Land | 0.703 sq km |
| | | Wet Area | 5.748 sq km |
| | | Population | 6414 |
| | | Household | 1153 |
| | | | |
| | Low - High | Settlements | 81 |
| | | Population | 21339 |
| Homburgue | | Household | 3848 |
| neatwave | | Agriculture Area | 98.208 sq km |
| | | Pakka Planned Area | 0.136 sq km |
| | | Pakka Unplanned Area | 1.841 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| SAID KANDO | | | | |
|-------------|------|---------------------------------|--------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 76.821 sq km | |
| | | Kachcha Area | 0.522 sq km | |
| | | Natural Vegetation in Wet Areas | 0.023 sq km | |
| | | Pakka Unplanned Area | 1.607 sq km | |
| | Low | Range Land | 0.028 sq km | |
| | | Education Facilities | 43 | |
| Earthquake | | Petrol Pumps | 6 | |
| | | Police Stations | 1 | |
| | | Power Plants | 1 | |
| | | Settlements | 32 | |
| | | Irrigation and Drainage Network | 7.284 km | |
| | | Road Network | 36.678 km | |
| | | Population | 33341 | |
| | | Household | 6276 | |

| | | Settlements | 32 |
|----------------------|------------------|---|--------------|
| | | Agriculture Area | 76.998 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.054 sq km |
| | | Forest Area | 0.001 sq km |
| Meteorological | Medium - Extreme | Natural Vegetation in Wet Areas | 0.891 sq km |
| Drought | | Range Land | 0.551 sq km |
| | | Water Body | 8.115 sq km |
| | | Wet Area | 0.249 sq km |
| | | Population | 27022 |
| | | Household | 5085 |
| | | | |
| | | Settlements | 32 |
| | | Agriculture Area | 95.895 sq km |
| | | Bare Area with sparse Natural | 0.067 sq km |
| | | Forest Area | 0.001 sa km |
| A | 1 | Natural Vegetation in Wet Areas | 1.109 sq km |
| Agricultural Drought | Low - Fign | Range Land | 0.687 sq km |
| | | Water Body | 10,102 sq.km |
| | | Wet Area | 0.31 sq.km |
| | | Population | 27022 |
| | | Household | 5085 |
| | | | 0000 |
| | | Settlements | 32 |
| | Low - High | Population | 26845 |
| | | Household | 5048 |
| Heatwave | | Agriculture Area | 76.784 sq km |
| | | Kachcha Area | 0.521 sq km |
| | | Pakka Unplanned Area | 1.614 sq km |
| | ı | 1 · | |
| | | Agriculture Area | 39.402 sq km |
| | | Natural Vegetation in Wet Areas | 0.501 sq km |
| | | Pakka Unplanned Area | 0.471 sq km |
| | | Education Facilities | 9 |
| Riverine Flood | Low - Extreme | Settlements | 6 |
| | | Irrigation and Drainage Network | 0.955 km |
| | | Road Network | 6.314 km |
| | | Population | 7372 |
| | | Household | 1387 |
| | 1 | | 1 |
| Cyclone | Nil | The UC falls out of vulnerable zone | for Cyclone |
| | | - | |
| Tsunami | Nil | The UC falls out of vulnerable zone | for Tsunami |

| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge |
|-------------|-----|---|

| SAKRAND 02 | | | | |
|----------------------|------------------|--|---------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 12.435 sq km | |
| | | Forest Area | 0.045 sq km | |
| | | Pakka Planned Area | 1.379 sq km | |
| | | Pakka Unplanned Area | 0.626 sq km | |
| | | Bus Stops | 2 | |
| | | Education Facilities | 45 | |
| | | Health Facilities | 5 | |
| | | Mobile Towers | 2 | |
| Earthquake | Low | Police Stations | 1 | |
| | | Post Offices | 1 | |
| | | Settlements | 33 | |
| | | Tourist Places | 1 | |
| | | Irrigation and Drainage Network | 3.102 km | |
| | | Road Network | 38.198 km | |
| | | Population | 35345 | |
| | | Household | 6861 | |
| | | | | |
| | | Settlements | 33 | |
| | | Agriculture Area | 12.487 sq km | |
| | | Forest Area | 2.225 sq km | |
| Drought | Medium - Extreme | Water Body | 0.31 sq km | |
| | | Wet Area | 2.944 sq km | |
| | | Population | 28730 | |
| | | Household | 5576 | |
| | | | | |
| Agricultural Drought | low | Agriculture Area | 0.003 sq km | |
| | 20 ** | Forest Area | 0.465 sq km | |
| | 1 | | F | |
| | | Settlements | 29 | |
| | | Population | 28548 | |
| Heatwaye | low - High | Household | 5542 | |
| ileulwuve | Low - High | Agriculture Area | 12.423 sq km | |
| | | Pakka Planned Area | 1.379 sq km | |
| | | Pakka Unplanned Area | 0.629 sq km | |
| | | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | | |
| | | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone | e for Cyclone | |
| | | | | |

| Tsunami | nami Nil The UC falls out of vulnerable zone for Tsunami | |
|-------------|--|---|
| | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge |

| SAWARI | | | | |
|----------------------|------------------|---|---------------|--|
| Hazard Type | Risk | Elements at Ris | sk | |
| | | Agriculture Area | 117.852 sq km | |
| | | Natural Vegetation in Wet Areas | 0.1 sq km | |
| | | Pakka Unplanned Area | 1.895 sq km | |
| | | Range Land | 0.096 sq km | |
| | | Bridges | 1 | |
| E authouse les | 1 | Education Facilities | 87 | |
| Еаттяриаке | LOW | Post Offices | 1 | |
| | | Settlements | 77 | |
| | | Irrigation and Drainage Network | 63.881 km | |
| | | Road Network | 224.501 km | |
| | | Population | 29691 | |
| | | Household | 5594 | |
| | • | | | |
| | | Settlements | 77 | |
| | | Agriculture Area | 118.156 sq km | |
| | Medium - Extreme | Bare Area with sparse Natural Vegetation | 6.18 sq km | |
| Meteorological | | Natural Vegetation in Wet Areas | 2.283 sq km | |
| Drought | | Range Land | 1.953 sq km | |
| | | Water Body | 4.475 sq km | |
| | | Wet Area | 10.646 sq km | |
| | | Population | 24038 | |
| | | Household | 4524 | |
| | | | | |
| | | Settlements | 15 | |
| | | Agriculture Area | 33.34 sq km | |
| | | Bare Area with sparse Natural Vegetation | 4.798 sq km | |
| Agricultural Drought | Low - Medium | Water Body | 1.907 sq km | |
| | | Wet Area | 4.626 sq km | |
| | | Population | 3985 | |
| | | Household | 750 | |
| | | | | |
| | | Settlements | 75 | |
| | | Population | 23876 | |
| Heatwave | Low - High | Household | 4499 | |
| | | Agriculture Area | 117.725 sq km | |
| | | Pakka Unplanned Area | 1.902 sq km | |

| Nil | The UC falls out of vulnerable zone for Riverine Flood |
|-----|--|
| | |
| Nil | The UC falls out of vulnerable zone for Cyclone |
| | |
| Nil | The UC falls out of vulnerable zone for Tsunami |
| | |
| Nil | The UC falls out of vulnerable zone for Storm Surge |
| | Nil Nil Nil Nil |

| SUHELLO | | | | |
|----------------------|------------------|---------------------------------|---------------|--|
| Hazard Type | Risk | Elements at Risk | | |
| | | Agriculture Area | 103.825 sq km | |
| | | Forest Area | 0.116 sq km | |
| | | Kachcha Area | 0.027 sq km | |
| | | Pakka Planned Area | 0.186 sq km | |
| | | Pakka Unplanned Area | 2.746 sq km | |
| | | Range Land | 0.086 sq km | |
| Earthquake | Low | Bridges | 5 | |
| | | Education Facilities | 73 | |
| | | Settlements | 84 | |
| | | Irrigation and Drainage Network | 53.69 km | |
| | | Road Network | 159.814 km | |
| | | Population | 39673 | |
| | | Household | 7144 | |
| | · | | | |
| | | Settlements | 84 | |
| | | Agriculture Area | 104.897 sq km | |
| | | Bare Area with sparse Natural | 135.686 sq km | |
| | | Vegetation | 0.0/7 | |
| Mataavalaniaul | | Forest Area | 2.267 sq km | |
| Drought | Medium - Extreme | Natural Vegetation in Wet Areas | 0.066 sq km | |
| | | Range Land | 2.335 sq km | |
| | | Water Body | 3.263 sq km | |
| | | Wet Area | 10.5/9 sq km | |
| | | Population | 32386 | |
| | | Household | 5835 | |
| | Ι | | | |
| | | Settlements | 58 | |
| | | Agriculture Area | 96.752 sq km | |
| | | Bare Area with sparse Natural | 167.757 sq km | |
| Agricultural Drought | Low - Extreme | Forest Area | 2.817 sg km | |
| | | Natural Vegetation in Wet Areas | 0.082 sg km | |
| | | Ranae Land | 2.908 sg km | |
| | | | | |

| | | Water Body | 4.065 sq km |
|----------------|------------|---|--------------------|
| | | Wet Area | 13.127 sq km |
| | | Population | 18463 |
| | | Household | 3327 |
| | | · · | |
| | | Settlements | 73 |
| | | Population | 31886 |
| | | Household | 5743 |
| Heatwave | Low - High | Agriculture Area | 103.601 sq km |
| | | Kachcha Area | 0.028 sq km |
| | | Pakka Planned Area | 0.187 sq km |
| | | Pakka Unplanned Area | 2.748 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone | for Riverine Flood |
| | | · | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | · · | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | • | · | |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |

| THAT | | | |
|---------------------------|------------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| | Low | Agriculture Area | 69.838 sq km |
| | | Forest Area | 0.014 sq km |
| | | Natural Vegetation in Wet Areas | 0.065 sq km |
| | | Pakka Unplanned Area | 2.277 sq km |
| | | Range Land | 0.009 sq km |
| Eauthouseles | | Education Facilities | 55 |
| Еантициаке | | Petrol Pumps | 4 |
| | | Settlements | 48 |
| | | Irrigation and Drainage Network | 7.22 km |
| | | Road Network | 79.775 km |
| | | Population | 35008 |
| | | Household | 6608 |
| | | · | |
| | | Settlements | 48 |
| | Medium - Extreme | Agriculture Area | 70.064 sq km |
| Meteorological Drought | | Bare Area with sparse Natural Vegetation | 1.332 sq km |
| | | Forest Area | 1.818 sq km |
| | | Natural Vegetation in Wet Areas | 3.507 sq km |
| | | Range Land | 0.128 sq km |
| | | Water Body | 2.993 sq km |

| | | | a (= _) |
|----------------------|---------------|---|-----------------|
| | | Wet Area | 0.65 sq km |
| | | Population | 28499 |
| | | Household | 5375 |
| | 1 | | T |
| | Low - High | Settlements | 31 |
| | | Agriculture Area | 69.3 sq km |
| | | Bare Area with sparse Natural Vegetation | 1.581 sq km |
| | | Forest Area | 2.259 sq km |
| Agricultural Drought | | Natural Vegetation in Wet Areas | 4.361 sq km |
| | | Range Land | 0.158 sq km |
| | | Water Body | 3.721 sq km |
| | | Wet Area | 0.809 sq km |
| | | Population | 20864 |
| | | Household | 3939 |
| | | | |
| | | Settlements | 47 |
| | | Population | 28271 |
| Heatwave | Low - High | Household | 5333 |
| | | Agriculture Area | 69.783 sq km |
| | | Pakka Unplanned Area | 2.288 sq km |
| | | | |
| | | Agriculture Area | 26.092 sq km |
| | Low - Extreme | Forest Area | 0.006 sq km |
| | | Natural Vegetation in Wet Areas | 3.372 sq km |
| | | Pakka Unplanned Area | 0.927 sq km |
| Riverine Flood | | Education Facilities | 7 |
| | | Settlements | 9 |
| | | Road Network | 15.062 km |
| | | Population | 13849 |
| | | Household | 2620 |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Storm Surge | Nil | The UC falls out of vulnerable zone | for Storm Surge |

ORGANIZATION STRUCTURE FOR DISASTER MANAGEMENT AT DISTRICT LEVEL

INTRODUCTION

Each year natural disasters kill thousands of people and inflict billions of dollars in economic losses. No nation or community is immune to the damage of disasters and certainly, the province of Sindh is no exception. Almost every year, a major or minor natural disaster disrupts the life and economy of people living in the province, especially those with high economic vulnerability or the poor strata of the population. Unless action is taken to reduce the toll of natural disasters, the damages and losses of disasters can only be expected to rise. The scientific and technological advances of today's world provide unprecedented opportunities for responding to the urgent need to mitigate the impacts of natural hazards.

It is a globally recognized fact that natural hazards do not kill but poor planning does. Better disaster management and disaster risk reduction can only be achieved through collective efforts in integrating hazard reduction policy and practice throughout the province. It is a need of the time and opportunity to reassess the approach to natural hazards and to develop strategies for reducing losses by prevention and preparedness.

Disaster management can be achieved through the collective effort of all segments of life. A central authority, like Provincial Disaster Management Authority, can oversee, plan, manage and coordinate for disaster management at the provincial scale, however, it is the responsibility of concerned departments and authorities to implement and execute disaster management measures at the grass-root level. For effective disaster management, it is also imperative to take onboard and empower communities at high disaster risk as first responders. The disaster management plan will be effective once the roles and responsibilities of each individual and department are well understood and disaster management measures are implemented.

Keeping in view the importance of disaster management at all levels i.e., from the Provincial level to UC or village level, different disaster management committees have been recommended to be constituted. These committees are District Disaster Management Authority (DDMA), Taluka Disaster Management Committee (TDMC), and Union Council Disaster Management Committee (UCDMC). The recommended composition of each committee is given in Table-2 to 4.

| Sr.# | Committee Representative | Role |
|------|---------------------------------------|-------------|
| 1. | Deputy Commissioner | Chairperson |
| 2. | Additional Deputy Commissioner | DDMO |
| 3. | Senior Superintendent of Police | Member |
| 4. | Assistant Director Local Government | Member |
| 5. | District Information Officer | Member |
| 6. | Cantonment Officer (Where Applicable) | Member |
| 7. | District Health Officer | Member |
| 8. | District Education Officer | Member |

Table 2: District Disaster Management Authority

| 9. | District Food Controller | Member |
|-----|--|-----------|
| 10. | Deputy Director Civil Defense | Member |
| 11. | District Officer Social Welfare | Member |
| 12. | District Officer Livestock | Member |
| 13. | District Chairman Zakat | Member |
| 14. | Executive Engineer (Works and Services) | Member |
| 15. | Executive Engineer Irrigation | Member |
| 16. | Executive Engineer Public Health | Member |
| 17. | Municipal Commissioners / CMOs / TMOs | Member(s) |
| 18. | Representative Officer of Armed Forces | Member |
| 19. | Two Elected Representatives nominated by the chair | Members |
| 20. | Two Representatives of NGOs/Civil Society | Members |
| 21. | Two Representatives of Business Community | Members |
| 22. | Representative of Agriculture and Livestock Department | Member |
| 23. | Representative of NHA | Member |
| 24. | Representative of Electric Supply Corporation | Member |
| 25. | Representative of SSGC | Member |
| 26. | Representative of Red Crescent | Member |
| 27. | Representative of Sindh Scouts | Member |
| 28. | Representation of Volunteers from Communities at Risk | Member(s) |

Table 3: TDMC Taluka Disaster Management Committee

| Sr.# | Committee Representative | Role |
|------|--|-------------|
| 1. | Assistant Commissioner | Chairperson |
| 2. | Mukhtiarkar | Secretary |
| 3. | Town Municipal Officer (TMO) | Member(s) |
| 4. | Sub Divisional Police Officer | Member |
| 5. | Taluka Education Officer | Member |
| 6. | Medical Superintendent Taluka Level Medical Facility | Member |
| 7. | Representative from Civil Defense | Member |
| 8. | Representative from Social Welfare Department | Member |
| 9. | Representative from Livestock Department | Member |
| 10. | Assistant Engineer (Works and Services) | Member |
| 11. | Assistant Engineer Irrigation | Member |
| 12. | Assistant Engineer Public Health | Member |
| 13. | Two Representatives of NGOs/Civil Society | Members |
| 14. | Two Representatives of Business Community | Members |
| 15. | Representative of Agriculture and Livestock Department | Member |
| 16. | Representative of Electric Supply Corporation | Member |
| 17. | Representative of SSGC | Member |
| 18. | Representative of Red Crescent | Member |
| 19. | Representative of Sindh Scouts | Member |
| 20. | Representation of Volunteers from Communities at Risk | Member |

| Sr.# | Committee Representative | Role |
|------|---|-------------|
| 1. | UC Administrator | Chairperson |
| 2. | Secretary UC | Secretary |
| 3. | Station House Officer (Police) – Concerned | Member |
| 4. | Two Representatives of NGOs/Civil Society | Members |
| 5. | Representation of Volunteers from Communities at Risk | Members |
| 6. | Representation of Renowned Persons | Members |

Table 4: UCDMC Union Council Disaster Management Committee

RESPONSIBILITY OF DISTRICT DISASTER MANAGEMENT AUTHORITY

- The DDMA shall work as a coordinating body of all government agencies and non-government organizations operating in the district and act as a focal authority in the conduction and implementation of plan and actions on disaster management
- Additional Deputy Commissioner who is proposed as Disaster Management Officer shall also work as Secretary DDMA and will provide administrative support to DDMA
- The DDMA shall ensure to take all possible disaster management measures in the district in accordance with the guidelines laid down by PDMA or NDMA
- The DDMA shall provide leadership by taking initiative to achieve MHVRA Informed Disaster Management Plan goals and objectives
- The DDMA shall coordinate with PDMA Sindh in disaster preparedness, response and recovery
- The DDMA shall provide guidance and support for the implementation of district response plans including management of the District Emergency Operation Centre

FUNCTION OF DDMA

- To review district disaster management plan, including district response plan in-line with Provincial and National disaster management plans and policies
- To ensure that risk maps are developed and updated and disaster-prone areas have been identified and prioritized in the district
- To coordinate the efforts for prevention and mitigation measures that are undertaken by the government and local authorities in the identified vulnerable areas of the district
- To organize and coordinate specialized disaster management training programs for different levels of officers, employees, and volunteer rescue workers in the district

- To facilitate community training and awareness programs with the support of local authorities, government and non-government organizations
- To set up, maintain, review and upgrade the mechanism for early warning and dissemination of accurate information to concerned authorities and the general public
- To review development plans prepared by the government departments, statutory or local authorities with a view that disaster management plan has been integrated into the development activities and projects of the plan
- To coordinate with, and give guidelines to, local authorities in the district to ensure that predisaster and post-disaster management activities in the district are carried out promptly and effectively
- To prepare, review and update district level response and contingency plans.
- To identify buildings and places which could, in the event of disaster situation be, used as relief centers and camps and make arrangements for water supply and sanitation in such buildings or places
- To distribute relief and facilitate rescue or ensure disaster preparedness and response
- To ensure operationalization of District Emergency Operation Centre (DEOC) equipped with all necessary gadgets
- To activate the District Emergency Operations Centre (DEOC) and ensure its uninterrupted operation during and after disaster events
- To carry out rapid damage and needs assessment and develop a report for assisting PDMA and other relevant stakeholders
- To coordinate and monitor early recovery and rehabilitation activities with the support of PDMA or relevant local and international stakeholders
- To prepare and continuously update databases of external agency projects, future priority areas, funding framework, available resources, areas of operations/expertise etc.
- To perform other functions as deemed necessary by the provincial government or provincial authority for disaster management in the district

RESPONSIBILITY OF TALUKA DISASTER MANAGEMENT COMMITTEE

- The TDMC shall work as front-line body for disaster management in the district and shall ensure implementation of disaster management measures set by DDMA and PDMA
- The TDMC shall interact directly with communities at risk in disaster preparedness, disaster risk reduction and response
- The TDMC shall Bridge between government and communities in disaster response
- The TDMC shall coordinate between DDMA, PDMA and all stakeholders working at grass-root level in pre, during and post disaster events

FUNCTION OF TALUKA DISASTER MANAGEMENT COMMITTEE

- Identification and updation of all hazards in their respective locations and conduct of risk and vulnerability analysis and communicate with DDMA and subsequently with PDMA
- Ensure that the officers and employees are trained in disaster management
- Ensure that resources relating to disaster management are maintained and readily available for use in the event of any threatening disaster situation or disaster
- To coordinate and monitor disaster management plan mainstreaming operations in the district and over all disaster management initiatives
- Land use planning and zoning within the municipality by preparing master plans while keeping the multi hazard of the municipality and Taluka in context
- To ensure the implementation of bylaws related to encroachment at hazardous places, building codes, land use planning and zonation etc.
- To identify evacuation/shelter places to face any disaster/emergency
- To monitor the disaster management activities of NGOs, UCDMCs and private sectors
- To share initial damage and needs assessment reports to DDMA and subsequently to PDMA
- To carry out relief, rehabilitation and reconstruction activities in the affected areas in accordance with the DDMA and PDMA
RESPONSIBILITY OF UNION COUNCIL DISASTER MANAGEMENT COMMITTEE

- 1. UCDMC shall work as front-line, first responder body at village, mohalla and ward level.
- 2. Shall assist TDMC, DDMA and PDMA especially in disaster response.
- 3. Shall encourage and keep record of volunteers in Union Council.
- 4. Shall formulate different groups to respond disaster and emergency events such as evacuation group, camp management group etc. and share this record with TDMC, DDMA and PDMA.
- 5. Shall prepare awareness and capacity development proposals and training programs and follow-up with TDMC, DDMA and PDMA for arranging such events at grass root level.

FUNCTION OF UCDMC

- 1. Identification and updation of all hazards in their respective locations and conduct of risk and vulnerability analysis and communicate with TDMC, DDMA and subsequently with PDMA.
- 2. To prepare/update UC level disaster management plan for emergent hazards or new hazards caused by any disaster event.
- 3. To make an analysis of disaster risk and to prepare a list of vulnerable villages and areas of the concerned union councils.
- 4. To mobilize community for maintaining public ways, public streets, culverts, Bridges and public buildings, de-silting of canals and other development activities.
- 5. To coordinate with the village and neighborhood UCs in case of emergency in order to get quick information about the severity and extent of a disaster impact and report it to the TDMC and DDMA.
- 6. To report cases of handicapped, destitute and socially excluded groups to TDMC, DDMA and PDMA in order to streamline their special needs in relief and response operation.
- 7. Mobilizing and coordinating work of volunteers and ensuring community participation.
- 8. Conduct of search and rescue operations in coordination with the rescue teams and Police.
- To provide assistance to other agencies for mobility/transport of staff, including rescue parties, relief personnel and relief materials. To communicate with the TDMC, DDMA or PDMA for required additional resources.

10. To monitor NGO activities and provide necessary support to ensure community participation by establishing coordination mechanisms among NGOs and local communities.

ESTABLISHMENT OF EMERGENCY OPERATION CENTERS

PROVINCIAL EMERGENCY OPERATION CENTER (PEOC)

As envisioned by PDMA Sindh, PEOC is established at HQ of PDMA Sindh. The center is equipped with modern tools and techniques for management and operation activities in pre, during and post disaster events. The center works under the management of PDMA with 24/7 operation.

The functions of PEOC are summarized below;

- Coordinating node for planning, management and operations of disaster management activities
- Inventory management and goods distribution.
- Assets and vehicles management and monitoring
- Monitoring of extreme weather and disasters
- Issuance of early warnings
- Disposal and monitoring of man and material resources during disaster events
- Coordination with community based associations, volunteers, NGOs and other relevant institutions involved in disaster management
- Assessment of disaster risk and elements at risk and dissemination of information to concerned departments
- Coordination for evacuation, medical, search, rescue and relief
- Preparation and collection of damage assessment reports
- Coordination with all management tiers
- Daily briefings on disaster events, search and rescue operations, damages and losses, recovery and rehabilitation
- Hosting of online meetings
- Damage data collection through imaging drones

DISTRICT EMERGENCY OPERATION CENTER (DEOC)

The PEOC established at PDMA HQ is connected with districts through DEOC. The DEOC is supposed to work as filed arm of PEOC for execution and implementation of instructions passed on by PEOC. The center is equipped with modern tools and techniques for management and operation activities in pre, during and post disaster events. The center works under the management of DDMA with 24/7 operation during disasters.

FUNCTION OF DEOC

The functions of DEOC are appended below;

- Receive information and instructions from PEOC regarding implementation and execution of action plans
- Monitor the situation and put everything ready and functional in the DEOC
- Dissemination of early warnings issued from PEOC to stakeholders and communities
- To coordinate with PEOC, PDMA, concerned departments and other stakeholders
- To monitor emergency operations and make efforts for preventing secondary hazards
- To conduct rapid assessment of the relief needs by collecting information from affected areas and circulate to PDMA and other concerned departments and stakeholders
- To deploy evacuation, medical, search and rescue teams in the affected areas
- To provide relief assistance in terms of relief camps, medical and sanitation facilities and temporary shelter to the affected population in the district
- To establish a liaison with concerned departments and stakeholders engaged in emergency response by anticipating resource inventory
- To collect information for daily briefings on disaster situation for PEOC, media, general public and other stakeholders
- Record keeping and preparation of consolidated reports and response plans and projects.
- Coordination and mobilization of community based associations, volunteers, NGOs and other relevant institutions involved in disaster management

SECTOR WISE ROLES AND RESPONSIBILITIES OF GOVERNMENT FUNCTIONARIES

AGRICULTURE AND LIVESTOCK DEPARTMENT

Pre-Disaster

- Capacity building of department regarding disaster management and risk reduction and implementation of sector specific disaster risk reduction measures
- Provide recommendation on changing/rescheduling of cropping patterns with respect to changing climate and weather scenarios
- Create Community Seed Bank at Union Council level
- Provide livestock vaccination and de-worming
- Assessment of high prone areas and estimation of possible damage and needs for recovery regarding livestock, crops, irrigation facilities in case of any disaster
- Mass awareness regarding epidemics and diseases to livestock and crops
- Close coordination with PDMA and DDMA

During-Disaster

- Close and regular coordination with DDMA and PDMA
- Immediate transfer of current situation to DDMA and PDMA
- Vaccination of livestock

Post-Disaster

- Facilitation to institutions / NGOs/ INGOs which focus on rehabilitation activities as per guidelines provided by DDMA and PDMA
- Submit report on damages and needs to DDMA and PDMA
- Mass awareness regarding epidemics and diseases to livestock and crops
- Vaccination of livestock
- Upgrade Community Seed Bank (CSB)
- Timely compensation to affected farmers

 Prepare overall report of the department regarding intervention and disseminate to DDMA and PDMA

PROVINCIAL DISASTER MANAGEMENT AUTHORITY (PDMA)

Pre-Disaster

- Close coordination with national and international institutions engaged in disaster forecasting.
- Coordinate meeting and engage DDMA for preparation of anticipated disasters
- Ensure readiness of equipment and inventory
- Disseminate disaster alerts to concerned DDMA with action plans for forecastable disasters
- Ensure availability of relief goods and other relevant stuff before anticipated disaster
- Advise concerned departments on removal of congestion from water ways before monsoon and flooding period
- Aware and sensitize public and private departments on main streaming disaster risk reduction in developing planning
- Ensure availability and functioning of provincial emergency operation center
- Provide and report high risk population and infrastructure in anticipated hazard areas.
- Capacity building of line and stakeholder department on disaster risk reduction and management.

During-Disaster

- Coordination and mobilization of man and material resources
- For rescue and evacuation of people, provide and manage temporary shelter and life restoration equipment in disaster affected regions
- Coordinate with line departments for health and veterinary services in the affected regions and ensure to control outbreak of any communicable diseases
- Coordinate with DDMA and line departments

• Coordinate with individual donors, donor organizations, NGOs and INGOs and ensure distribution of relief among disaster affectees

Post-Disaster

- Coordination with DDMA and line departments for need and damage assessment
- Need and damage assessment reporting to higher management, NGOs, INGOs and other agencies for rehabilitation
- Ensure rehabilitation on build back better principle

DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA)

Pre-Disaster

- Close coordination with PDMA and other relevant stakeholders
- Risk assessment and identification of disaster-prone areas
- Aware and sensitize public and private departments on main streaming disaster risk reduction in developing planning
- Coordinate meeting and engage TDMC for preparation of anticipated disasters.
- Ensure readiness of equipment and inventory
- Disseminate disaster alerts to concerned TDMC with action plans for forecastable disasters
- Ensure availability of relevant staff before anticipated disaster
- Advise concerned departments on removal of congestion from water ways before monsoon and flooding period
- Ensure availability and functioning of district emergency operation center
- Arrange emergency response exercises and drills along with volunteer groups, social welfare and civil defense on various disaster scenarios

During-Disaster

- Mobilization of man and material resources
- For rescue and evacuation of people, provide and manage temporary shelter and life restoration equipment in disaster affected regions
- Coordinate with TDMC and line departments
- The DDMA shall lead the evacuation of people to safer places with the assistance of PDMA.
 DDMA shall also ensure safety, security, supply chain, life commodities and management of relief camps
- Only authorized officials of DDMA shall brief media on disaster situation and the response activities.

Post-Disaster

- Coordination with TDMC and line departments for need and damage assessment
- Need and damage assessment reporting to PDMA
- Ensure rehabilitation on Build Back Better principle

CIVIL DEFENSE

Pre-Disaster

- Assign representatives for DDMA to participate in meetings
- Information sharing regarding capacities and needs of Civil Defense department regarding disaster risk management
- Capacity building of Civil Defense department regarding disaster risk management
- Information sharing regarding technical and personnel expertise with DDMA
- Conduct trainings for Volunteers regarding Rescue and other relevant expertise in collaboration with Health department and PDMA
- Create awareness regarding rescue, evacuation and first aid
- Effectively establish, train and systemize volunteers' initiatives in collaboration with education department / institutions

During-Disaster

- Fire fighting
- Rescue and evacuation
- Assign volunteers in coordination with PDMA and DDMA
- Communicate to DEOC about details of all activities
- Communicate to DEOC any additional resources required for performing the above tasks
- Facilitate line departments as per demand in disaster response

Post-Disaster

• Assist in rehabilitation process if required

EDUCATION DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA and participate in meetings
- Information sharing regarding capacities and needs of Education department regarding disaster risk management
- Teachers and students are informed about the disaster prone areas of the district
- Teachers and students are informed of their responsibilities to take care of materials and documents to safe places during disaster
- Facilitate and collaborate with PDMA in preparation of disaster management curriculum
- Collaborate with PDMA and DDMA in synergizing volunteers

During-Disaster

- Mobilize human resources for intervention during disaster
- Inform schools situated in high risk areas about hazard and hazard forecast
- Assist in arrangement of relief and shelter camps in educational institutes for the disaster affectees

- Facilitate Health department and other relevant entities in arranging medical camps, blood donations and provision of medical aid during disaster and emergencies
- Coordinate with PDMA and DDMA in assigning volunteers for emergency response

Post-Disaster

- Assessment of damages occurred to educational institutes
- Provide assistance to teachers, students and other staff who are victimized by disasters (lack of food, shelter, etc.)
- Rehabilitation and reconstruction of affected educational facilities
- Facilitate institutions / NGOs / INGOs which focus on rehabilitation of educational facilities
- Prepare overall report of the department regarding intervention and disseminate to PDMA and DDMAs

FINANCE DEPARTMENT

Pre-Disaster

- Regular coordination with PDMA
- Allocate budget on contingency basis, to handle any emergency situations
- Facilitate other departments in planning and meeting their financial needs

During-Disaster

- Provide funds to PDMA and other line departments for procurement of material and equipment required for emergency response
- Provide funds to PDMA and other line departments for rescue and relief activities

Post-Disaster

- Get statistical data regarding actual damage and recovery needs from all line departments
- Provide funds for execution of rehabilitation process

HEALTH DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA, and participate in meetings
- Information sharing regarding capacities and needs of Health department regarding disaster risk management
- Build capacity of health department regarding disaster risk management and preventive health care especially in disaster prone areas
- Monitor the general health situation, e.g. monitor outbreak of diseases
- Provide specific information required regarding precautions for epidemics
- Establish a health mobile team in district and taluka headquarter hospital
- Set-up an information Centre to organize sharing of information for public information purposes
- Prepare first aid kits, medicines, water test kits, chloramines and anti-snake venom serum.
- Collaboration with relevant organizations / partner NGOs for participation and support through technical resources
- Up-gradation and smooth functioning of hospitals, BHUs, equipped with required staff, medicines and equipment
- Database and linkages with ambulance services/blood banks
- Health and hygiene awareness and education
- Ensure proper disposal of hospital waste

During-Disaster

- Provide emergency treatment for the seriously injured
- Ensure emergency supplies of medicines and first-aid
- Supervise food, water supplies, sanitation and disposal of waste
- Assess and co-ordinate provision of ambulances and hospitals where they could be sent (public and private);

- Provide special information required regarding precautions for epidemics
- Set-up an information Centre to organize sharing of information for public information purposes
- Conduct disaster impact assessment on health
- Intervene in case of disease outbreak
- Medical camps and vaccination
- Ongoing surveillance with regard to health issues and disease outbreaks

Post-Disaster

- Conduct disaster impact assessment on health situation
- Prepare plan for the following year along with reports and submit to PDMA and concerned department.
- Medical camps and vaccination
- Rehabilitation of health infrastructure affected during disaster
- Preparation of impact assessment surveys covering strengths and weaknesses of interventions and impact on affected victims and dissemination of learning to PDMA and other concerned institutions

IRRIGATION DEPARTMENT

Pre-Disaster

- Inspection and identification of vulnerable embankments
- Monitoring and dissemination of river water levels
- Implementation of SOPs defined by Bund Manual
- Ensure readiness of equipment and machinery before monsoon and flooding season
- Monitor and disseminate flood level information to DDMA and PDMA
- Initiate necessary embankments reinforcing interventions for vulnerable embankments
- Initiate interventions for river training where necessary

- Introduce and ensure water harvesting and modern water management interventions in likely drought affected areas
- Ensure safety and compactness of irrigation channels, canals, branches, etc. before start of monsoon season to avoid breaches in irrigation system during heavy rains
- Ensure removal of congestion from storm water and draining channels before monsoon

During-Disaster

- Ensure 24/7 vigilance of vulnerable embankments
- Measure and report flood water inundation levels to DDMA and PDMA
- Ensure to drain/de-water from agriculture fields and its safe conveyance to minimize losses
- Coordinate with PDMA and DDMA during entire disaster event for execution of on-demand action plans

Post-Disaster

- Conduct assessment of damages and needs and report to PDMA through DEOC
- Restore and repair damaged irrigation systems
- Prepare overall report of the department regarding intervention and disseminate to PDMA and DDMA

INFORMATION DEPARTMENT

Pre-Disaster

- Close coordination and liaison with PDMA and DDMA
- During monsoon, flooding season and forecastable hazards issuance of press releases regarding hazards and preparedness plans of the government
- Issue and publish disaster alerts on appropriate media forums
- Coverage and publication of government initiatives on disaster risk reduction and management
- Ensure media coverage and publication of PDMA and DDMA meetings for pre disaster preparations

During-Disaster

- Coordination with PDMA and DDMA for announcement of warnings and updates on disasters
- Publication of bulletins on government actions, facilities, relief and rescue efforts
- Publication of camp management and relief distribution announcements
- Publication of safety measures during disasters to minimize disaster domino effects
- Communicate voice of affectees to concerned departments

Post-Disaster

- Focus on problems being faced by the people of the affected area
- Publish, broadcast /telecast programs highlighting strengths, weaknesses and scams in disaster response activities
- Publish, broadcast /telecast programs highlighting government initiatives and collective response of NGOs, INGOs and other departments for relief and rehabilitation

PAKISTAN METEOROLOGICAL DEPARTMENT (PMD)

Pre-Disaster

- Update and upgrade forecast equipment
- Timely and authentic forecast of rains, windstorms and other forecastable hazards
- Timely transfer of information regarding abnormal weather conditions to PDMA

During-Disaster

- Monitoring of flood waters, river flows and sharing of information with PDMA
- Forecasting for any confluencing disaster
- Issuance of precautionary measures to avoid domino effects of disaster

Post-Disaster

• Technical assistance in rescue and rehabilitation process

POLICE DEPARTMENT

Pre-Disaster

- Coordinate with the DDMA in the pre-disaster planning
- Participate in DDMA meetings
- Capacity building of Police department regarding disaster risk management
- Information dissemination through 15 helpline service to local residents
- Prepare team for emergency intervention
- Prepare plan for shifting to safer places and early warning system

During-Disaster

- Co-ordinate with DEOC
- Assistance in shifting of rescued/affected people to relief camps and hospitals
- Provide protection and easy access to rescue and relief personnel/vehicles
- Maintain law and order
- Provide warning / instruction to travelers
- Divert traffic on alternate routes as and when necessary
- Ensure security to workers of NGOs and INGOS who perform duties for disaster response
- Ensure safety and security of relief goods and maintain discipline during relief distribution process
- Provide security in Relief Camps

Post-Disaster

• Assist in relief and rehabilitation process

REVENUE DEPARTMENT

Pre-Disaster

- Assign representatives for DDMA, and participate in meetings
- Information sharing regarding capacities and needs of Revenue department regarding disaster risk management
- Capacity building of Revenue department regarding disaster risk management
- Assessment of high prone areas and estimation of possible damage and needs for recovery in case of emergency
- Arrangement of financial resources
- Facilitate getting tax exemptions to institutions/NGOs/INGOs focus on disaster risk management
- Collect and update population data at village level

During-Disaster

- Coordination with the DEOC
- Establish relief distribution centers
- Accept relief donations and relief support
- Timely release of funds

Post-Disaster

- Allocation of funds for recovery and rehabilitation process
- Assessment of damage of industry/business, crops and livestock and settlement of applicable taxes accordingly in coordination with Industry, Agriculture and Irrigation departments

ARMED FORCES

Pre-Disaster

• Coordinate with the DDMA in the pre-disaster planning

- Prepare necessary equipment, labor, transportation and other materials for emergency interventions
- Provide training to soldiers and determine the role of soldiers who are stationed in flood prone areas
- Assist in evacuation of people to safe places

During-Disaster

- Maintain liaison with the DEOC for vital inputs during response
- Collect information and warn appropriate Army units for engagement in safety, rescue and evacuation activities
- Establish communication infrastructure and supplement the civil communication set-up if required
- Coordinate all military activity required by the civil administration
- Provision of medical care with the help of the medical teams, including treatment at the nearest armed forces hospital
- Transportation of relief material
- Provision of logistic back-up (aircrafts, helicopters, boats)
- Assist in establishment of Relief Camps
- Assist in evacuation of people to safe places during the disaster
- Installation of temporary Bridges, Bunds

Post-Disaster

- Cooperate and coordinate with district authorities
- Assist in rehabilitation process if required

SOCIAL WELFARE AND COMMUNITY DEVELOPMENT

Pre-Disaster

• Coordination with NGOs and civil society organizations working for disaster risk management

- Empower the extremely vulnerable people emphasizing women and children through public awareness involving respective departments for various fields such as Education, Health etc.
- Capacity building of community based groups and volunteers engaged in disaster management activities

During-Disaster

- Provide information on the situation of the disaster to the DEOC
- Coordinate all NGOs / INGOs and civil society organizations working during the emergency response
- Monitor progress of relief operations in the affected areas
- In coordination with PDMA, Health, Revenue and other line departments, ensure delivery of relief to most vulnerable segments of society such as children, orphans, widows, destitute
- Assist and facilitate Damage and Needs Assessment teams from NGOs
- Share human resources with DDMA

Post-Disaster

- Monitor and follow up the status of the extremely vulnerable people
- Assist and facilitate Damage and Needs Assessment teams from NGOs
- Conduct impact assessment studies and analysis of strengths and weaknesses of stakeholders and disseminate learning to PDMA, DDMA and other concerned institutions
- Facilitate institutions / NGOs/ INGOs which focus on rehabilitation activities

NGOs / INGOs

Pre-Disaster

- Facilitate PDMA and DDMA for capacity building regarding disaster risk management
- Capacity building of community groups regarding disaster risk management
- Linkages with concerned departments and institutions for providing technical and financial resources regarding diverse sectors related to disaster management

• Resource mobilization at local and international level

During-Disaster

- Collaborate and facilitate in relief operations
- Incorporate local and international expertise in disaster response
- Facilitate establishment of temporary shelters and camps
- Facilitate in overall disaster response in collaboration with concerned departments
- Regular updates and alerts to local and international partners
- Utilization of existing resources and further mobilization at local and international level
- Assessment of losses using sphere standards

Post-Disaster

- Collaborate and facilitate in rehabilitation activities
- Incorporate local and international expertise in rehabilitation activities
- Facilitate overall rehabilitation in collaboration with concerned departments
- Impact assessment studies and sharing findings with PDMA, DDMA, local and international partners
- Linkages with partners for sustainable resources mobilization

DISASTER MANAGEMENT GUIDELINES

INTRODUCTION

Multi-hazard vulnerability Risk Assessment of Shaheed Benazirabad district reveals that the district is prone to multiple natural disasters. The pertinent hazards to district are hydro-meteorological hazards including drought, heatwave and riverine flood with the potential to cause urban flooding. The risk of geophysical hazards is low in the district. In modern technological era, hydro-meteorological hazards can be precisely forecasted and action can be taken well in time to minimize damages and losses. In other words, the vulnerabilities and risks are manageable and losses and damages can be minimized through adoption of best management practices and mobilization of resources.

These guidelines introduce best practices which can be adopted to manage risk of natural disasters in the district.

| Riverine Flood | 1. | River Indus in Sindh can be segmented in three broad reaches Guddu to |
|-----------------------|----|--|
| | | Hyderabad, Hyderabad to Kotri and Kotri to Arabian Sea. Additionally, |
| | | during past years, road bridges have been built over river Indus at |
| | | different location. Though such developments and interventions were |
| | | essential to bring prosperity in the region, however, have embedded |
| | | impacts on fluvial geomorphology and natural flood plain of the Indus. |
| | | Further, extensive human interventions such as use of land for agriculture, |
| | | road infrastructure, civil embankments, etc. are observed through satellite |
| | | imagery within the existing flood plain. In such scenario, risk of breaches |
| | | in flood protective embankments and consequential flooding of adjoining |
| | | areas have been increased. To minimize this risk, it is essential to restore |
| | | Indus flood plain in its natural form. This arrangement will significantly |
| | | reduce riverine flood risk through adoption of ecosystem friendly disaster |
| | | risk reduction. The arrangement will not only reduce disaster risk but |
| | | restore and enrich biodiversity in Indus flood plain. |
| | | |
| | 2. | Though river Indus floodplain is bounded by flood protective |
| | | embankment, but still some parts of district Shaheed Benazirabad |
| | | adjoining river Indus are likely to be affected due to breaches in |
| | | embankments of river Indus. |
| | 2 | It is highly recommended to identify and reinferce costions of yuberable |
| | 5. | and reinforce sections of volterable |
| | | embankments before flooding season to avoid breaches in embankments |
| | | ana consequennai aamages. |
| | 4. | As far as riverine floods are concerned, the Sindh province has sufficient |
| | | time for preparation and reaction. Close monitoring of river discharge |

| | level in coordination with irrigation department, the government of | |
|------------|--|--|
| | Punjab, Federal Flood Commission and Pakistan Meteorological | |
| | Department (PMD) be conducted. | |
| | | |
| | 5. Timely alerts be issued to people living in low lying areas within flood | |
| | plain. | |
| | 6. In case of high anticipated flows evacuation of people and livestock be | |
| | carried out. | |
| | | |
| | Soaking and compacting of embankments before arrival of flood water. | |
| | 9 Deinforcement and stone nitching of high risk embankments | |
| | o. Remorcement and stone pricting of high-risk embankments. | |
| | 9. Use alternative eco-friendly options like use of bamboo wood etc. to | |
| | minimize erosion impact on high-risk embankments. | |
| | | |
| | 10. Where necessary and possible, erection of guide embankments and spur | |
| | before arrival of high flood water. | |
| | 11. 24/7 vigilance of high-risk embankments by Sindh Irrigation Department. | |
| | 12. Readily availability of breach filling stock and machinery at high risk | |
| | embankments. | |
| | | |
| | 3. Restoration of natural eco-system within flood plain such as revival of braided (Varee channels and natural lakes within flood plain to diverge | |
| | braided/Yazoo channels and natural lakes within flood plain to disperse | |
| | and distribute flood water across the plain. | |
| | 14. Removal of possible congestion factors within the flood plain. | |
| | 1.5. Public participation comprising local people be encouraged in pre-and | |
| | during flood periods. | |
| | | |
| Earthquake | 1. The geology of Sindh is divisible in three main regions, the mountain | |
| | ranges of Kirthar, Pab containing a chain of minor hills in the west and in | |
| | east it is covered by the Thar Desert and part of Indian Platform where | |
| | the main exposure is of Karoonjhar Mountains, which is famous for Nagar | |
| | Parkar Granite. District Shaheed Benazirabad falls away from any | |
| | major fault line and is unlikely to be affected by a massive earthquake. | |
| | 2. Some of manufactor funds, structured to Studie and (a) Key and the studies | |
| | 2. Some of prominent faults situated in Sindh are (a) Karachi-Jati, (b) | |

| | Surjan-Jhimpir, (c) Pab Fault (d) Hub Fault and (e) Allah Bund-Rann of |
|----------|---|
| | Kutch faults. |
| | |
| | 3. Though risk of geophysical hazards in Shaheed Benazirabad district is |
| | low but still some actions must be taken to avoid losses in case of minor |
| | iolts. It is highly recommended to identify old and weak buildings in the |
| | city and other urban settings of the district local concerned authorities |
| | may deside expansion or retrafitting of such buildings (structures |
| | may decide evacuation of refronting of such buildings / shuctures. |
| | 4. It is also recommended that, new housing schemes, societies and |
| | infrastructure be built with proper town planning and following Building |
| | Codes recommended for the zone in which Shahood Rengizinghad district |
| | |
| | is situated. |
| | 5. Local government departments must be strengthened to manage situation |
| | arisen from earthquake jolts. Strengthening must include capacity |
| | building to get as first responder in any likely situation |
| | boliding to der us this responder in dry ikery stocholi. |
| Heatwave | 1. The district has witnessed rapidly increased severity of heatwaye in the |
| | past five years. The district is moderately populated, which significantly |
| | increases the changes of heaturnes impacts |
| | increases me chances of nearwave impacts. |
| | 2. Heatwaves are forecastable hazards and actions can be taken well |
| | before occurrence of heatwaves. The most suitable action is issuance of |
| | warnings and glerts in public for precautions and safety. Suitable media |
| | for the purpose is social media and SMS |
| | |
| | 3. Scientific studies suggest that, frequency and intensity of heatwaves is |
| | increased due to climate change. Though climate change is global |
| | phenomena, however, its impacts can be minimized through local |
| | interventions. The most efficient and cost-effective solution is tree |
| | plantation. Tree plantation must be encouraged at different levels |
| | including accomment functionaries NCOs community and individual |
| | |
| | |
| | 4. Additionally, introduction of reduced Urban Heat Islands (UHI) through |
| | policies and implementation in infrastructure development will |
| | significantly reduce impacts of heatwayes. |
| | |
| Drought | 1. Shaheed Benazirabad is a moderately populated district with closely |
| | |

| | spaced homes in major cities. Climatic condition of the district can be |
|---------|--|
| | categorized as Hot and Semi-Arid (Climate Classification of Pakistan |
| | (Khan et al., 2010). Average annual rainfall received during a year |
| | across the district is 110.86mm. Agriculture is practiced in the district |
| | which is mainly dependent on canal irrigation. |
| | 2. Drought is also forecastable hazard and can be predicted well in advance. Though drought may not bring any prominent famine like conditions in the district, however, it may cause reduction in agricultural production and some extent disturb food supply for the animals and livestock. The best practice to manage drought related impacts is storage of food supplies for both humans and animals. |
| | 3. The situation of drought may vary in future due to climate change effects, therefore, introduction of drought resilient crops is need of the time. Additionally, efficient use of available water resources and introduction of efficient irrigation systems in agriculture sector is also required. |
| Cyclone | According to MHVRA Study 2022, there is no Cyclone Hazard in Shaheed Benazirabad district. |
| Tsunami | According to MHVRA Study 2022, there is no Tsunami Hazard in Shaheed Benazirabad district. |

STANDARD OPERATING PROCEDURES

INTRODUCTION

Overall, disaster risk reduction is collective responsibility of concerned departments, associated line departments, private sector and communities. Synergized and coherent efforts are required at each cycle of disaster in order to minimize and avoid disaster losses and damages. The implementation of this disaster management plan would only be possible until roles and responsibilities of every department are defined and well understood.

ACTION PLAN FOR FLOOD

The monsoon and flooding period is well defined and occur almost every year with different intensities and cause losses at different scales. The recommended action plan for monsoon and flooding is tabulated below:

| Action | Timelines | Responsibility |
|--|-----------|---|
| Letter to irrigation department for identification of vulnerable embankments and disaster mitigation measures | April-May | PDMA |
| Inspection, maintenance and ensure readiness of flood fighting equipment available with PDMA | May-June | PDMA |
| Inspection, maintenance and ensure readiness of flood fighting equipment available with line departments | May-June | Local Government, Irrigation, and other relevant functionaries |
| Letter to concerned departments for removal of congestions in water ways | May-June | PDMA |
| Conduct pre monsoon meetings/conference with concerned departments | June-July | PDMA |

Table 5: Action Plan for Flood Hazard Management

| Organization and conduct of pre monsoon meetings headed by DDMA and chalking out of monsoon contingency and action plans | June-July | PDMA to write letter to concerned departments and organize such meetings through online or other feasible mechanism |
|--|-------------------------|---|
| Interaction and close liaison with Pakistan MD on weather forecast | June-July | PDMA |
| Dissemination of severe weather alerts to concerned DDMA and likely population to be affected | Based on forecast | PDMA |
| Daily monitoring of discharge data and flood inundation levels | During flooding | Sindh Irrigation Department |
| Deployment of man and material resources and soaking, inspection and monitoring of flood protecting infrastructure | Pre and during flooding | Sindh Irrigation Department |

ACTION PLAN FOR FORECASTABLE DISASTERS

Severe weather, heatwave, and drought are only forecastable hazards. For such hazards following action plan is recommended

Table 6: Action Plan for Heatwave Hazard Management

| Action | Timelines | Responsibility |
|-------------------------------|-------------------|----------------|
| Interaction with PMD for | Based on forecast | PDMA |
| forecasting and monitoring of | | |
| heatwave | | |
| | | |
| Dissemination of forecast to | Based on forecast | PDMA |
| | | |

| concerned DDMA and local | | |
|----------------------------------|---------------------------|---------------|
| community | | |
| | | |
| Mobilization of NGOs, INGOs | During disturbance period | PDMA and DDMA |
| and individuals for arrangement | | |
| of heat stroke and medical camps | | |
| within affected areas | | |
| | | |

Table 7: Action Plan for Drought Hazard Management

| Action | Timelines | Responsibility |
|---------------------------------|---------------------------|----------------|
| Interaction with PMD for | Based on forecast | PDMA |
| forecasting and monitoring of | | |
| drought | | |
| | | |
| Dissemination of forecast to | Based on forecast | PDMA |
| concerned DDMA and local | | |
| community | | |
| | | |
| Mobilization of NGOs, INGOs | During disturbance period | PDMA and DDMA |
| and individuals for stocking of | | |
| food and life support items to | | |
| prevent and mitigate famine | | |
| conditions depending upon | | |
| severity and spell of drought | | |
| | | |

ACTION PLAN FOR UNFORECASTABLE HAZARDS

Earthquake

The earthquake is unforecastable hazard and does not provide reaction time to prevent damages. The recommended post disaster action plan are as follows

Table 8: Action Plan for Earthquake Hazard Management

| Action | Timelines | Responsibility |
|-----------------------------------|---------------|----------------|
| Mobilization of man and material | Post disaster | PDMA and DDMA |
| resources for rescue and recovery | | |

| Mobilization of NGO, INGO, volunteer groups, scouts and armed services for rescue and recovery | Post disaster | PDMA and DDMA |
|--|---------------|---------------|
| Coordination and establishment of relief camps, mobile medical camps, life support facilities and provision of relief to affectees | Post disaster | PDMA and DDMA |
| Coordination and mobilization of rescue teams to search and rescue life in collapsed structures | Post disaster | PDMA and DDMA |
| Coordination with National Disaster Management Authority (NDMA) for seeking assistance from international agencies (depending on severity of events and damages/losses) | Post disaster | PDMA |
| Coordination and mobilization of resources on Build Back Better principles. | Post disaster | PDMA |

SOP FOR PEOC AND DEOCS

- For the smooth operation of the emergency activities the PEOC and District Emergency Response Centre (DEOC) will work under defined Standard Operating Procedures (SOPs). These SOPs are broadly categorized in three sections
 - a. Action on receipt of early warning, safe evacuation, search and rescue, initial assessment, relief distribution, recovery and deactivation of response.
 - b. Coordination and information dissemination
 - c. Contingency planning and response actions

- For localized emergencies, the situation shall be dealt within the regular operating mode of the emergency management services in the district.
- DDMA shall activate the DEOC and take the operational lead for the district government response.
- The DEOC will serve as the center for receiving early warning and issuing information to public at village level, taking measures to evacuate people, updating relevant departments, response agencies, and media etc.
- The DEOC will lead the coordination and management of relief operations in affected areas in the district with the assistance of PEOC.
- DEOC will coordinate with all concerned departments and humanitarian agencies at district level.
- DEOC will coordinate for early recovery with the assistance of PDMA and other concerned departments.
- In standby position, PEOC and DEOC shall be alert and ready to start emergency operations. The PEOC shall coordinate with concerned departments like NDMA, PMD, etc. for regular updates on likely disaster events. Once the threat is established, the PDMA shall approve the alert and activate response mechanism of PEOC and DEOC.
- Once PEOC and DEOC activation is approved or issued, both centers will remain fully operational on 24/7 basis and coordination shall be established with all concerned departments.
- PEOC and DEOC will collect regular updates on disaster situation and after normalization of situation and with mutual consultation shall inform PDMA to issue stand down or disaster deactivation call and final report on emergency operations will be circulated to stakeholders.
- The operationalization of PEOC and DEOC means complete activation of centers during disaster situation. Management of PDMA shall ensure full functionalities of PEOC including stock for emergency food, office supplies, communication system with backup support, electricity generators, computers, screens, multimedia projectors and other necessary equipment. While Deputy Commissioner Shaheed Benazirabad shall ensure availability of all necessary equipment and supplies at DEOC for 24/7 operations. The deputy commissioner or chairperson DDMA will also ensure availability and presence of representatives of DDMA in DEOC during emergency operations for liaison and close coordination and smooth emergency response.
- A contact information of relevant government officials, influential personnel, political figures, volunteer groups, social welfare organizations and communities of high disaster risk prone areas shall be collected and maintained by PEOC and DEOC. For establishing quick liaison and coordination this

contact information shall be used by both PEOC and DEOC. In addition to these contacts, PEOC will arrange random SMS alerts, robo calls etc. through commercial cellular services.

- The PEOC will establish the direct contact/coordination with district disaster management officer for disaster alerts and warnings and onward dissemination and other immediate actions.
- All warnings and alerts shall be carefully scrutinized by the central body i.e. PDMA and disaster warning alerts shall only be issued through single nodal agency to avoid any circulation of misinformation etc.
- During the disaster, all instructions, guidelines, action plans and advisories on disaster events, evacuation, relief operations etc. shall be issued by PEOC or DEOC in consultation with PEOC.

DISASTER MANAGEMENT PLAN

INTRODUCTION

Following disaster management measures are recommended for effective preparation, response and rehabilitation of communities. PDMA may identify suitable partners/agencies to carry out each of the below-mentioned measures to maximize the effectiveness of disaster management plan and minimize losses in case of any disaster.

| Riverine Flood | | | |
|----------------|---|---|--|
| UCs | at Risk (9) | Bhura, Daulatpur, Guhram Mari, Hamal Faqir, Marvi, Mehrabpur, Qazi Ahmed 02, Said Kando, That | |
| UCs (32) | JCs not at Risk 32) 60th Mile, A, Abdul Hassan, Ahmed Bughio, Amirji, Bandhi, Bheri, Chanesar 01, Chanesar 02, Dalildero, Daur, Ghandtar, Ghulam Hyder Shah, Haberi, Jam Sahib, Jamal shah, Jhoro Khan Shar, Karam Jamali, Khadhar, Khair Shah, Khar, Kumbleema, Manharo, Mirzabagh, Nawabshah 04, Obharisawari, Pir Zaki, Qazi Ahmed 01, Rais Mohammad I K.Brohi, Sakrand 02, Sawari, Suhello | | |
| Gene Desc | eral ription | This district is located in the center of the Sindh province of Pakistan, and is therefore commonly known as the heart of Sindh. River Indus flows on the western border of the district which makes the western Talukas Sakrand and Kazi Ahmad vulnerable to riverine floods. Shaheed Benazirabad is prone to severe threat to riverine flood. It was hit by 2010, 2011 and 2012 riverine floods The district has an efficient canal system. The irrigation system of this district, due to the canal system, tube wells and river, is quite efficient. The canal system is mainly in the central part of the district; particularly Nusrat Canal is the main irrigation facility in the central zone. Total reported area of the district is 451,000 hectares, out of which 244,000 hectares (53%) are cultivated. According to MHVRA study 2022, Flood hazard in the district is of intensity "Low to Very High". According to MHVRA study 2022, Flood risk in the district is "Low to Extreme". | |
| | | Disaster Management Measures | |
| | | Preparedness | |
| 1. | Recording of | daily river discharge at barrages in Sindh, and regular dissemination among stakeholders. | |
| 2. | 2. In case of high discharge, dissemination of warnings and alerts to masses living in flood plain. | | |
| 3. | Identification and inspection of vulnerable embankments likely to be affected due to flooding during pre- monsoon season, as per "Bund Manual" of irrigation department. | | |
| 4. | 4. Inspection and readiness of flood fighting equipment available with district government departments prior to flooding season. | | |
| 5. | 5. Classify and map bunds based on their origin (Mud, Brick, Stone, Concrete, Boulder, etc.) | | |
| 6. | 6. Readiness of flood camps in high riverine flood and breaching risk areas. | | |
| 7. | 7. Maintenance and strengthening of identified weak embankments. | | |
| 8. | . Awareness and motivation campaigns on construction of flood resilient buildings and infrastructures. | | |

9. Regular awareness campaigns on flood precautions and safe evacuations using various media platform.

10. Inclusion and implementation of Disaster Risk Reduction (DRR) measures in development projects at planning

stage for building flood resilient infrastructure.

- 11. Conduct of satellite imagery based study for identification of vulnerable embankments before each monsoon and flooding period.
- 12. Collection and management of contact information of area/village influential for alert and warning dissemination.
- 13. Readiness of community-based volunteers and other related organizations / NGOs.
- 14. Regular community-based flood fighting trainings through government departments or any other appropriate platforms.
- 15. Installation of digital flood level gauges along embankments and dissemination of real-time flow level measurements to concerned authorities.
- 16. Installation of surveillance cameras at safe places for consistent monitoring of structural integrity of vulnerable embankments.

Response

- 1. Mobilization of rescue services, relevant NGOs, scouts and volunteers.
- 2. Evacuation of people and livestock to shelters/camps.
- 3. Camp management as per standard practices.
- 4. Relief distribution.
- 5. Precautionary measures for communicable diseases.
- 6. Activation of mobile health and education services for flood affectees.
- 7. Arrangements for early recovery including flood de-watering and early restoration of communication and essential services.

Recovery and Rehabilitation

- 1. Damage assessment of flood affected areas.
- 2. Conduct post flood repairs or refurbishment of embankments/barrages/canals
- 3. Resettlement of population on build back better basis.
- 4. Complete restoration of communication and essential services.

| Earthquake | | |
|---|--|--|
| UCs at Risk | All UCs | |
| General Description | An earthquake is a sudden shaking of the ground caused by two chunks of earth's crust sliding past one another. District Shaheed Benazirabad falls away from any major fault line and is less likely to be affected by a massive earthquake. Although earthquakes are short-lived, usually not lasting more than a minute, they can leave behind incredible damage. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake. Over the last sixty years, earthquakes of intensity lower than 5 on Richter Scale, including those in 1945 and 1985, have struck the region comprising the macro-environment and thus far they have been of minor significance. According to MHVRA study 2022, Earthquake hazard in the district is of intensity "Low". | |
| Disaster Management Measures | | |
| | Preparedness | |
| Identify situatio | ring and inventorying weak buildings and structures especially in urban settings of the district and n demanding action by concerned departments. | |
| 2. Prepar schools | ation of landuse plans, town plans and implementation of building codes in new residential schemes, , public and private offices. | |
| 3. Implem | 3. Implementation of DRR measures in public infrastructure development schemes. | |
| 4. Establis post-ec | 4. Establishment of search and rescue infrastructure and services which can be mobilized as first responder in post-earthquake situation. | |
| 5. Mobiliz safety | Mobilize NGOs, INGOs, community development organizations and volunteers, and conduct earthquake safety awareness campaigns and drills especially in main urban settings. | |
| 6. Availat support | bility of necessary material and equipment required for establishing temporary shelters with life t facilities i.e. mobile medical camps, schools, power supply, water and sanitation etc. | |
| 7. Availat earthqu | pility of alternative communication system in case if usual communication means are disturbed by Jake. | |
| 8. Prepar | ation of medical emergency plan to manage mass casualties in case of any major earthquake event. | |
| Response | | |
| 1. Obtain operati | firsthand information on intensity of earthquake and damages; prioritize areas for search and rescue on. | |
| 2. Mobiliz and he | e community-based volunteers, scouts and other trained personnel to hard hit areas to assess situation p victims. | |
| 3. Establis | h emergency camps / shelters with necessary life support facilities. | |
| 4. Establis | h medical camps for provision of first aid and possible medical assistance to injured. | |
| 5. Evacua | te people from damaged houses to safe places and shelters. | |
| 6. Provide stampe | e security in affected areas and maintain law and order situation to prevent incidents of thefts and de. | |
| 7. Arrang | ement and conduct of aerial $/$ drone survey of the affected areas. | |
| 8. Establis | h information and help desks for facilitation of affectees. | |
| | | |

9. Restore essential services like power, water supply, and telecommunication of critical infrastructure like hospitals, control Rooms, etc. on priority basis.

Recovery and Rehabilitation

- 1. Detailed damage and need assessment for recovery and rehabilitation.
- 2. Rehabilitation on build back better principle.
| Cyclone | | | | |
|-------------|---|--|--|--|
| UCs at Risk | According to MHVRA study 2022, there is no risk of Cyclone in Shaheed Benazirabad district. | | | |

| Heatwave | | | | | | | |
|-------------|--------------------------------|---|--|--|--|--|--|
| UCs | at Risk | All UCs | | | | | |
| Gen Desc | eral cription | Climatic condition of the district can be categorized as Hot and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010)). The district is considered, one of the hottest districts in Pakistan. The climate of the district is extreme, both in winters and summers. Temperatures above 45 °C are fairly common during late May and early June. On 26 May 2010, record breaking severe heatwave hit the district and the mercury level reached 52 °C, which is the highest temperature ever recorded in the district, third highest temperature recorded in Pakistan. December and January are the coldest months with average maximum and minimum temperature of 26 °C and 10 °C but sometimes, during winters, temperature falls to 0 °C. According to MHVRA study 2022, Heatwave hazard in the district is of intensity "Severe". According to MHVRA study 2022, Heatwave risk in the district is "Low to High". | | | | | |
| | Disaster Management Measures | | | | | | |
| | | Preparedness | | | | | |
| 1. | Consistent for environment | ture development strategy: Tree plantation, restoration of natural ecosystem, construction of friendly and well planned residential societies, offices, infrastructure and human dwellings. | | | | | |
| 2. | Monitoring fo Advisories, a | or hot weather alerts through local and international sources and issuance of timely Hot Day nd Hot Day Warnings. | | | | | |
| 3. | Upgradation heatstroke po | of major public health care facilities with necessary equipment and medicines to treat atients. | | | | | |
| 4. | Heatstroke a social welfar | wareness campaigns and wide public coverage through media, social media, SMS, NGOs and e organizations. | | | | | |
| 5. | Arrangement | s for uninterrupted supply of electricity and water in vulnerable areas. | | | | | |
| | | Response | | | | | |
| 1. | Mobilization camps and d | of NGOs, social welfare organization and volunteers for arranging heatstroke facilitation istribution of fresh drinking water in affected areas. | | | | | |
| 2. | Local radio F | M broadcasts to disseminate heatstroke safety and precautions. | | | | | |
| 3. | Mobilize mot | oile medical teams for first-aid and other medical emergency support in affected area. | | | | | |
| 4. | Record keepi | ing of heatwave patients and fatalities. | | | | | |
| | | Recovery and Rehabilitation | | | | | |
| 1. | Post event re | view of heatwave plan and modifications if required. | | | | | |

| Drought | | | | | | | |
|------------------------------|--|--|--|--|--|--|--|
| UCs at Ris | All UCs | | | | | | |
| General Description | Climatic condition of the district can be categorized as Hot and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010)) Average annual rainfall received during a year across the district is 110.86 mm. Shaheed Benazirabad contributes significantly in agriculture sector of Sindh because its climate is suitable for production of various food items including the Kharif crops of maize, rice, sugarcane, cotton, bajra and Rabi crops of wheat, barley, Gram and barseen. In addition to these, fruit orchards are abundant in the district. Shaheed Benazirabad is vulnerable to droughts. The eastern part of taluka Daur [Akro 1 and Akro 2] is desert and barren area which receives very little rainfall. Agriculture and livestock of taluka Daur (eastern part) is badly affected by acute shortage of water. According to MHVRA study 2022. Meteorological drought hazard for district Shaheed Benazirabad is "Extreme" Meteorological drought risk for district Shaheed Benazirabad is "Medium to Extreme" Agricultural drought hazard for district Shaheed Benazirabad is "Mid to Extreme" | | | | | | |
| Disaster Management Measures | | | | | | | |
| Preparedness | | | | | | | |
| 1. Imple impe weat | Implement Drought Early Warning System (EWS) at provincial/district level to get clear indications of the impending drought and its consequences, e.g. forecast of impending drought conditions related to changing weather conditions linked to El Nino or La Nina events. | | | | | | |
| 2. Imple in ag | nentation of water supply and demand management and encouragement of efficient irrigation systems iculture. | | | | | | |
| 3. Resea | rch and promote drought resistant agriculture crops. | | | | | | |
| 4. Resili | ence and improvement of adaptive capacity of farmers. | | | | | | |
| 5. Moni levels | pring of temperature, precipitation, potential evapotranspiration, soil moisture, stream flow, groundwater lakes, and reservoirs for drought forecasting. | | | | | | |
| 6. Contr | ol ground water extraction from upper and lower aquifers to be within the sustainable yield limits. | | | | | | |
| | Response | | | | | | |
| 1. Asses | data about the nature of drought conditions and their impact. | | | | | | |
| 2. Provi | ion and installation of solar water pumps for availability of clean drinking water. | | | | | | |
| 3. Publi | information campaign for water management and saving. | | | | | | |
| | Recovery and Rehabilitation | | | | | | |
| 1. Cash | and in-kind support to farmers for next cropping. | | | | | | |
| 2. Awar | eness and encouragement of farmers on best irrigation practices and water saving. | | | | | | |
| | | | | | | | |
| | Tourami | | | | | | |

| | | | | | 13 | onam | • | | | | | | |
|-------------|---------------------|----|-------|-------|-------|-------|------|--------|----|---------|----|---------|-------------|
| UCs at Risk | According district. | to | MHVRA | study | 2022, | there | is n | o risk | of | Tsunami | in | Shaheed | Benazirabad |

SHELTER LOCATION MAP

As part of preparedness, response, and rehabilitation against hazards, shelter places are integral. These are necessary to relocate, evacuate, or replenish the population that may be affected from hazards. Proposed shelters are illustrated in the maps.



*Annex-A details the list of vulnerable settlements within flood plains prone to riverine flooding *Annex-B details the list of flood shelter locations



*Annex-C details the list of earthquake shelter locations

PROPOSED PRIORITY DISASTER RISK MANAGEMENT PROJECTS

INTRODUCTION

Following are the recommended disaster risk management projects, which may be initiated to ensure effective disaster management in district Shaheed Benazirabad. PDMA may identify suitable partnering agencies / line departments to carry out and prioritize each proposed project.

| | Hazard wise list of Price | Hazard wise list of Priority Disaster Risk Management Projects | | | | | |
|----|---|---|--|--|--|--|--|
| | Disaster Risk Management Projects/ Studies | Brief | | | | | |
| | | Riverine Flood | | | | | |
| 1. | Geomorphological study of flood plain & river course modelling | Conduct flood plain study for identification of bottlenecks, including elevated islands (Annex – D) impeding the flow of (super) flood water, and Indus River course modeling (historic and predictive) for simulating catchment processes and river flow, etc. | | | | | |
| 2. | Conduct feasibility study for Indus River training and straightening (Annex – E). | The river has a tendency to meander over large width of low lying land thereby flooding it occasionally. River training measures, like bell bunds, guide and confine the river flow within the embankments. Straightening the river speeds up the water so high volumes of water can pass through an area quickly. Dredging makes the river deeper so it can hold more water. | | | | | |
| 3. | Installation of river/flood flow digital gauges at suitable locations for real time monitoring of water level, water discharge rates, wave height and flow speed. | Digital water gauges may be installed to collect water flow characteristics. Digital water gauge is an electronic device, which uses an advance processor chip as a controller, records the water flow characteristics through measuring electrodes and transmit it using wired/wireless communication channel after digital processing. | | | | | |
| 4. | Monitoring of vulnerable bunds using IP Camera systems and Drones for surveillance during floods. | Image camera sensors and drones have relatively low procurement cost, portability, high efficiency, durability, maintenance and power consumption. Camera networks can effectively be used at remote 'Landhis' for real-time monitoring of flood level. | | | | | |
| 5. | Capacity building of vulnerable communities | Create Community based disaster risk management (CBDRM) associations and equip them with training and equipment for early response, including rope rescue, sand bags, bamboo and others. | | | | | |
| 6. | Develop emergency operation center. | Establish and equip emergency operation center with modern tools and techniques for management and operation activities in pre, during and post disaster events. | | | | | |
| 7. | Establish a database of resources and equipment for emergency response in relevant agencies | Create a well-maintained data repository for all available resources with operational status, quantity, location and maintenance authority in the district | | | | | |
| | | Earthauake | | | | | |
| 1. | Ensure implementation of building codes and standards. | Prepare policy and SOP to ensure new buildings in the district are constructed as per the seismic codes and standard of the area. | | | | | |
| 2. | Identification and retrofitting of weak existing structures and unsafe buildings (schools, hospitals and government offices). | Coordinate with local community regarding unsafe buildings and regularly conduct building safety surveys to check structural integrity of buildings against the seismic risk of the district and take necessary retrofitting measures to strengthen weak structures. Create database of vulnerable and unsafe buildings and | | | | | |

| | retrofitting measures taken to strengthen the structure of such buildings. | | | | | | |
|----|--|---|--|--|--|--|--|
| 3. | Preparation of rescue and rehabilitation plan | Coordinate with line departments to create a comprehensive plan with clearly defined roles and responsibilities of first responding departments, as well as, correspond with rescue agencies/NGOs for their role in an event of earthquake. The plan should also details the rescue equipment available with concerned departments. | | | | | |
| | Drought | | | | | | |
| 1. | Conduct feasibility study for identification of suitable sites for rainwater harvesting and aquifer recharge in the district. | The rainwater harvesting sites should be identified by using geospatial technologies and ancillary data, which can be used as clean water aquifers by communities, which in turn can use it for drinking, and irrigation purposes. | | | | | |
| | | Potential rainwater harvesting sites may be identified by using Analytical Hierarchy Process (AHP) and spatial analyst tool, with multiple thematic layers (rain data, population, digital elevation model, soil type, etc.) | | | | | |

COST BENEFIT ANALYSIS

INTRODUCTION

- 1. Cost Benefit Analysis (CBA) is a key analytical tool that can provide quantitative information regarding the prioritization of risk reduction based on comparing benefits of an actual or planned intervention with its costs.
- Cost Benefit Analysis (CBA) can play a pivotal role in advocacy and decision-making on Disaster Risk Reduction (DRR) by demonstrating the financial and economic value of incorporating DRR initiatives into planning.
- 3. In an age of austerity, cost-benefit analysis continues to be an important tool for prioritizing efficient DRM measures but with a shifting emphasis from infrastructure-based options (hard resilience) to preparedness and systemic interventions (soft resilience), other tools such as cost-effectiveness analysis, multi-criteria analysis and robust decision-making approaches deserve more attention.
- 4. Studies categorize interventions into hard and soft type of measures. Hard resilience refers to the strengthening of structures and physical components of systems in order to brace against shocks imposed by extremes such as earthquakes, storms and floods. In contrast, soft resilience (Behavioural DRR) refers to less tangible and process-oriented measures as well as policy in order to robustly cope with events as they occur and minimize the adverse outcomes.
- 5. The studies find that many of the highest economic returns exist for behavioural DRR strategies
- 6. The benefits of hazard mitigation are the avoided losses, i.e., those losses that would have occurred in a probabilistic sense if the mitigation activity had not been implemented.

COST BENEFIT ANALYSIS - SHAHEED BENAZIRABAD DISTRICT

The existing nature of disasters in Shaheed Benazirabad district can be categorized as low to Extreme. The prominent hazards in the district is heatwave, drought and flood. The meteorological drought risk in the district ranges from medium to extreme, while agricultural drought in the district ranges from low to extreme. There is no risk of cyclone, storm surge, and Tsunami in the district. The risk of earthquake is determined to be low. As far as Heatwave is concerned Shaheed Benazirabad district is at low to high risk. As far as riverine flood is concerned the settled areas of UCs in the district are likely to be effected in breaching scenario of flood protection embankments of river Indus. As far as population living within the flood plain is concerned, they are well aware of flood risk and live on their own risk, therefore, government functionary is recommended to be mobilized for dissemination of warnings and alerts to population, safe evacuation and providing temporary shelters. Based on the results of the MHVRA study the hazards of the district can be managed through soft and enhanced management measures. In this scenario, cost benefit analysis of proposed interventions is appended in table below:

| S. no. | Soft resilience | Cost | Benefit | | |
|--------|---------------------|-------------------------------------|--|--|--|
| | (Behavioral DRR) | | | | |
| 1. | Identification and | Identification and management of | Shelter places are highly beneficial at times of | | |
| | management of | shelter spaces is a cost-effective | disaster as it offers a unified accommodation | | |
| | shelters | way to ensure rapid, and | place for affected people. Shelter place also | | |
| | | effective management of | helps administration in effective management of | | |
| | | population in times of crisis. | affectees and provide them with required relief. | | |
| | | Government schools can serve as | Shelters serve as centralized facilities where | | |
| | | ideal cost-effective shelter spaces | government can concentrate relief efforts | | |
| | | in district Shaheed Benazirabad, | including distribution of relief goods and essential | | |
| | | as these can accommodate large | food supplies to affected people. Shelter spaces | | |
| | | number of people. Gradually, | keep people off the highways during and after | | |
| | | permanent shelters can be | disaster. | | |
| | | established in future to avoid use | Shelters are often the only safe heaven for those | | |
| | | of educational facilities. | without the financial means to take other | | |
| | | | protective measures. | | |
| | | | | | |
| 2. | Monitoring / | Pre-emptive monitoring activity to | Timely identification of weak embankments and | | |
| | Strengthening of | check the wellness and structural | repairs would prevent flood water from | | |
| | flood protection | integrity of flood protection | breaching the river floodplains and thereby save | | |
| | embankments | embankments before the onset of | millions of acres of crop land, settlements and | | |
| | | monsoon season. This would allow | infrastructure from inundation, possibly saving life | | |
| | | identification of embankments that | and property. This would also reduce the burden | | |
| | | are in need of repairs and would | on emergency services during hazard and the | | |
| | | help identify areas where new | government can concentrate efforts on severely | | |
| | | embankments are required. | affected areas. Less damage to communication | | |
| | | Following this activity, assets can | lines including roads and power lines would | | |
| | | be mobilized to enhance the flood | improve disaster response and outreach. This | | |
| | | protection embankments prior to | would also result in reduced number of internally | | |
| | | the occurrence of high flow in | displaced people (IDPs). | | |
| | | rivers. | | | |
| 3. | Early warning | Dissemination of forecast of | Early warnings give people time to prepare in | | |
| | system for | heatwaves from the | advance and postpone activities after daytime. | | |
| | heatwave | meteorological department | Local authorities would get ample time to | | |
| | | through public radio | establish relief centers with provisions of shade | | |
| | | announcements, print and digital | and hydration. Hospitals would be prepared to | | |
| | | media increases the preparedness | receive more patients than usual. An overall | | |
| | | of local populace against the | reduction in emergency cases would reflect in less | | |
| | | impending hazard. | mortality and more savings in medical | | |

Table 10: Cost Benefit Analysis of Disaster Risk Measures in District Shaheed Benazirabad

| | | | expenditure. |
|----|-------------------|-------------------------------------|---|
| | | | |
| 4. | Awareness | Public private partnership and use | Public awareness and public education for |
| | campaigns | of electronic/print media for | disaster reduction helps to reduce disaster risks. It |
| | | raising public awareness is a cost- | mobilizes people through clear messages, |
| | | effective approach to build | supported with detailed information. People who |
| | | society resilience and improved | know how to react in case of a disaster, |
| | | disaster risk management | community leaders who have learned to warn |
| | | capabilities of vulnerable | their people in time, and whole social layers who |
| | | communities. | have been taught how to prepare themselves for |
| | | | natural hazards can contribute to better |
| | | | mitigation strategies and dissemination of |
| | | | information on the consequences of hazards. |
| | | | Education and knowledge can provide people |
| | | | with tools for vulnerability reduction and life- |
| | | | improving self-help strategies. |
| 5. | Early warning for | Enhanced communication between | Early warning system and streamlined |
| | riverine floods | the upstream and local Irrigation | communication between the upstream and local |
| | | department allows ample time for | irrigation department help lowers the adverse |
| | | emptying reservoirs and increase | impacts of floods in the shape of reduced |
| | | flows to downstream areas in | damage to crops, settlements and infrastructure. |
| | | advance of the arrival of flood | This all results in a positive socio-economic impact. |
| | | waters. | |
| 6. | Strengthening of | Setup of temporary health | Mobile health facilities play a very significant |
| | mobile health | facilities reduce difficulty in | role in the mitigation of disaster because of their |
| | care facilities | patients' transportation to | particular function in providing essential first aid. |
| | | permanent hospital facilities. | Ease of access to basic health facilities will reduce |
| | | Mobile health care units are | burden on hospitals. |
| | | already available with | The systematic organization and easy |
| | | government of Sindh, their | mobilization of the staff, equipment and medical |
| | | mobilization to disaster | supplies in a safe environment are crucial if |
| | | management will ensure | disaster response is to be prompt and effective. |
| | | lifesaving. | |

ANNEX – A – VULNERABLE SETTLEMENTS PRONE TO RIVERINE FLOOD

List of Vulnerable Settlements (34) within flood Plains Prone to Riverine Flood

| S.# | Name | Latitude | Longitude | Area (acres) |
|-----|--------------------------|----------|-----------|--------------|
| 1 | Achar Khali Bhan | 25.995 | 68.257 | 7.76 |
| 2 | Darya Khan | 26.308 | 67.981 | 18.67 |
| 3 | Goth Ali Murad Chandio | 26.311 | 68.007 | 28.58 |
| 4 | Goth Mir Mohammad Lakho | 26.238 | 68.065 | 66.06 |
| 5 | Goth Mohsin Shah | 26.206 | 68.070 | 14.90 |
| 6 | Goth Nazar Mohammad Shah | 26.195 | 68.080 | 35.84 |
| 7 | Goth Pakhial | 26.019 | 68.305 | - |
| 8 | Goth Saleh Shah | 26.264 | 68.044 | 29.07 |
| 9 | Haji Arab Juneja | 26.347 | 67.956 | 16.97 |
| 10 | Haji Musa Zardai | 26.338 | 67.976 | 19.96 |
| 11 | Hamza Jatoi | 26.299 | 68.001 | 38.46 |
| 12 | Ismailband | 26.380 | 67.965 | 72.84 |
| 13 | Jalal Khan Makrani | 26.036 | 68.307 | 29.62 |
| 14 | Jan Mohammad Lashari | 26.194 | 68.071 | 9.10 |
| 15 | Karam Baghio | 26.402 | 67.979 | 28.10 |
| 16 | Kashorpur | 26.335 | 67.947 | 54.35 |
| 17 | Khatian | 26.396 | 67.942 | 2.18 |
| 18 | Mani | 26.304 | 67.967 | 30.88 |
| 19 | Marufani Saiyid | 26.008 | 68.174 | 13.32 |
| 20 | Nurpur | 25.997 | 68.185 | 17.68 |

| S.# | Name | Latitude | Longitude | Area (acres) |
|-----|---------------------|----------|-----------|--------------|
| 21 | Razi Jatoi | 26.299 | 67.986 | 15.32 |
| 22 | Sarai Murad Ali | 26.125 | 68.144 | 57.49 |
| 23 | Untitled Settlement | 26.040 | 68.141 | 20.97 |
| 24 | Untitled Settlement | 26.347 | 67.956 | 6.30 |
| 25 | Untitled Settlement | 26.043 | 68.139 | 24.01 |
| 26 | Untitled Settlement | 26.135 | 68.139 | 7.35 |
| 27 | Untitled Settlement | 26.138 | 68.140 | 5.55 |
| 28 | Untitled Settlement | 26.151 | 68.130 | 21.06 |
| 29 | Untitled Settlement | 26.210 | 68.082 | 16.28 |
| 30 | Untitled Settlement | 26.252 | 68.052 | 4.73 |
| 31 | Untitled Settlement | 26.309 | 67.970 | 27.98 |
| 32 | Untitled Settlement | 26.310 | 67.964 | 13.11 |
| 33 | Untitled Settlement | 26.394 | 67.960 | 9.33 |
| 34 | Untitled Settlement | 26.416 | 67.940 | 6.65 |

ANNEX – B – SHELTER LOCATIONS DESCRIPTION – RIVERINE FLOOD

The given shelter locations for riverine flood are proposed on the findings of the MHVRA 2022 study and information obtained through satellite technology and online verifiable sources. It is recommended to conduct on ground physical surveys to evaluate their suitability.

| Shelter location | | Co-ordinates | Area (acres) | Estimated Tents (numbers) | Avg. elevation (ft.) | |
|---------------------|---------------------|---------------|------------------------|---------------------------------|----------------------------|-----|
| | Upper right corner: | 26°29'36.84"N | 67°59'5.55"E | | | |
| 1 | Upper left corner: | 26°29'33.79"N | 67°58'47.90"E | 137 | ~6200 | 113 |
| | Lower right corner: | 26°29'1.19"N | 67°59'9.74"E | | 0200 | |
| | Lower left corner: | 26°28'58.22"N | 67°58'52.30"E | | | |
| | Upper right corner: | 26°22'37.38"N | 68° 0' <i>57</i> .11"E | | ~19000 | 125 |
| 2 | Upper left corner: | 26°22'34.48"N | 67°59'55.38"E | 401 | | |
| Z | Lower right corner: | 26°22'6.59"N | 68° 1'1.22"E | 421 | | |
| | Lower left corner: | 26°22'6.84"N | 67°59'59.80"E | | | |
| | Upper right corner: | 26° 8'15.87"N | 68°12'24.64"E | | | |
| 3 | Upper left corner: | 26° 8'20.52"N | 68°11'59.22"E | 00.0 | | |
| | Lower right corner: | 26° 7'58.93"N | 68°12'26.76"E | 78.3 | ~4300 | 103 |
| | Lower left corner: | 26° 8'3.33"N | 68°11'57.86"E | | | |

A total of 3 shelter locations have been selected as Flood shelter places across district Shaheed Benazirabad. The shelter locations are selected based on their proximity to the population vulnerable to flood, distance from area under high flood risk, elevation from the nearby areas, and accessibility to roads and other basic facilities (healthcare, education, police station, etc.) A total of approximately 29,700 tents (tent with size of 45 sq. m each) can be set up within the demarcated shelter places.

ANNEX – C – SHELTER LOCATIONS DESCRIPTION – EARTHQUAKE

The given shelter locations for earthquake are proposed on the findings of the MHVRA 2022 study and information obtained through satellite technology and online verifiable sources. It is recommended to conduct on ground physical surveys to evaluate their suitability.

| Shelter location | Co-ordinates | Area (acres) | Estimated Tents (numbers) | Avg. elevation (ft) |
|---------------------|--|-----------------|---------------------------------|---------------------------|
| 1 | Upper right corner: 26° 9'26.78"N 68°17'19.31"E Upper left corner: 26° 9'37.18"N 68°16'59.50"E Lower right corner: 26° 9'18.63"N 68°17'15.98"E Lower left corner: 26° 9'25.16"N 68°16'57.69"E | 42.6 | ~2000 | 100 |
| 2 | Upper right corner: 26°15'15.30"N 68°22'44.83"E Upper left corner: 26°15'15.29"N 68°22'29.24"E Lower right corner: 26°14'40.23"N 68°22'45.24"E Lower left corner: 26°14'30.68"N 68°22'29.80"E | 1058 | ~47000 | 105 |
| 3 | Upper right corner: 26°19'38.52"N 68° 7'37.73"E Upper left corner: 26°19'13.513"N 68° 7'21.93"E Lower right corner: 26°19'14.66"N 68° 7'44.89"E Lower left corner: 26°19'11.37"N 68° 7'33.66"E | 84.4 | ~4000 | 112 |
| 4 | Upper right corner: 26°28'38.67"N 68°19'43.50"E Upper left corner: 26°28'39.51"N 68°18'57.08"E Lower right corner: 26°27'46.29"N 68°19'44.02"E Lower left corner: 26°27'50.99"N 68°19'23.57"E | 376 | ~17000 | 124 |
| 5 | Upper right corner: 68°19'23.57"E 68°18'35.22"E Upper left corner: 26°35'20.08"N 68°18'26.34"E Lower right corner: 26°35'4.31"N 68°18'34.48"E Lower left corner: 26°35'4.97"N 68°18'22.63"E | 38 | ~1800 | 124 |
| 6 | Upper right corner: 26°17'36.42"N 68°37'35.51"E Upper left corner: 26°17'32.69"N 68°37'9.40"E Lower right corner: 26°17'6.16"N 68°37'32.04"E Lower left corner: 26°17'9.55"N 68°37'10.21"E | 147 | ~6600 | 90 |

A total of 6 shelter locations have been selected as Earthquake shelter places across district Shaheed Benazirabad. The shelter locations are selected based on their proximity to the population vulnerable to earthquake, and accessibility to roads and other basic facilities (healthcare, education, police station, etc.) A total of 78,400 tents approximately (tent with size of 45 sq. m each) can be set up within the demarcated shelter places.

ANNEX – D – ELEVATED ISLANDS WITHIN EMBANKMENTS IN SHAHEED BENAZIRABAD

Total 28 elevated islands have been identified within the embankments in district Shaheed Benazirabad, with a cumulative area of approximately 281.03 acres. These elevated islands obstruct the river flow and thereby may be demolished/removed to reinstate the normal river flow within the flood plain.



ANNEX – E – RIVER TRAINING AND STRAIGHTENING

Since most of the time riverine flood are contained in between river embankments therefore only settlements lying in flood plain are prone to low to very high floods while settled areas of Shaheed Benazirabad district are safe from riverine flood. However, settled areas of the district may be endangered to severe flooding condition if any breaching occurs in river embankment.

Embankment breach due to Normal River flow meandering:

Indus river continuously meander within flood plain area (3-5 miles). As river reached very close to embankments it starts eroding it hence making it vulnerable to any type of flood (low to very high flood). To avoid this situation irrigation department, make loop bund where river is close to main bund. This is a costly task and not a permanent solution because of the reason that river again change its path in 4-5 years and starts meandering to other part of bund. Therefore, there is need to stop the river to come close to the main bunds. It is, thereby, suggested to straight the path of river where it is currently meandering inside the flood plain away from the both sides of main bunds.

Below figure illustrate the concept:



Once path A to B has been developed, then river in normal condition will flow in this path. However annual or bi-annual cleaning of this path will be required by removing the sediments/clay deposit in this path. Special boats will be required to carry out this task by excavating the sand/clay beneath the river and put it on its sides. The feasibility study may be carried out to estimate the cost of digging of A-to-B path and its bi-annual maintenance and to compare it with the cost of making and maintenance of loop bunds to avoid meandering of the river. If the proposed conceptual model is financially and technically viable than it can be taken as project. If this conceptual model is implemented than damaged loses (life and material) due to breaching scenarios may be minimized or even reduced to zero.

ANNEX – F – LIST OF EQUIPMENT AVAILABLE IN DISTRICT SHAHEED BENAZIRABAD

| Equipment | Quantity |
|---------------------------|----------|
| De-watering Machine | 100 |
| Bulldozers / Dozers | 11 |
| Vehicle / Bus/ Van/Truck/ | 28 |
| Ambulances | 2 |

Source: Provincial Monsoon contingency plan 2020 – PDMA, Government of Sindh