

MHVRA

INFORMED DISASTER MANAGEMENT PLAN

2023-2032

DISTRICT NAUSHAHRO FEROZE



[HTTPS://SINDHWEATHERPORTAL.WORDPRESS.COM/2012/10/18/WIDESPREAD-FLOOD-DESTRUCTION-PHOTOS-BY-SWP/FLOOD-2/#MAIN](https://sindhweatherportal.wordpress.com/2012/10/18/widespread-flood-destruction-photos-by-swp/flood-2/#main)

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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 Naushahro Feroze 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 Naushahro Feroze 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, cost-benefit 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 Naushahro Feroze 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 NAUSHAHRO FEROZE

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.

1. 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;

Table 1: Recommended Committee for Reviewing Disaster Management Plan

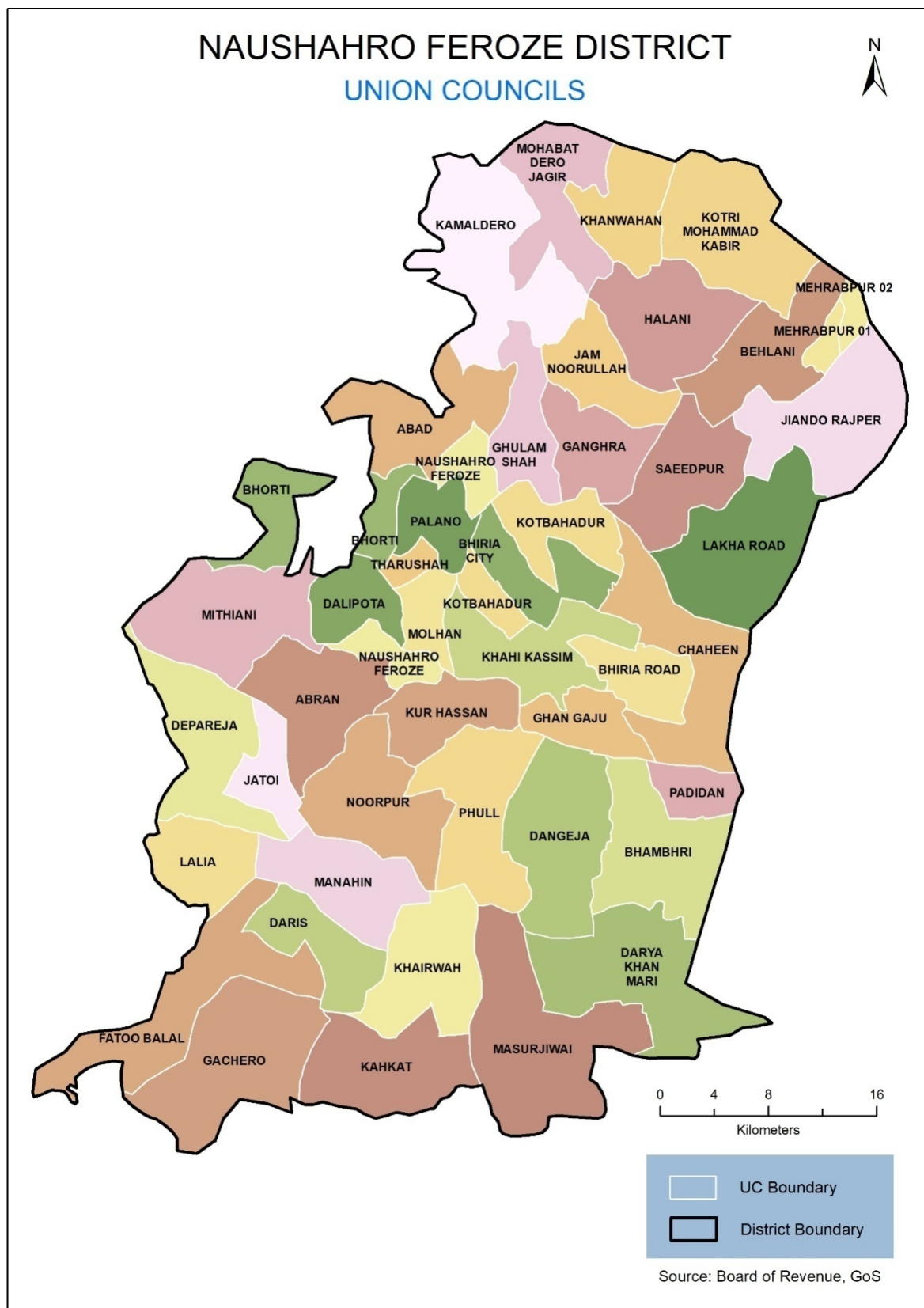
| Committee Representative | Role |
|--|-------------|
| DG, PDMA Sindh / Dir Ops PDMA | Chairman |
| Concerned DC or representative officer | Member |
| Concerned officer from local government | Member |
| Elected representative of the concerned district | Member |
| Representatives from disaster affected 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 |

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 NAUSHAHRO FEROZE



GEOGRAPHY

| | | |
|--------------------------------|---|----------------------|
| District area in Sq. Km | 2,683 | |
| Coordinates | Longitude 67° 48' 2" to 68° 26' 51" East Latitude 26° 32' 45" to 27° 13' 36" North | |
| Surrounding Districts | Khairpur in the East Larkana in the North Dadu in the West Jamshoro and Shaheed Benazirabad in the South | |
| Climate Conditions | Hot and Arid | |
| Coldest Month | January | |
| Hottest Month | June | |
| Seasonal Temperatures | Max Mean (°C) | Min Mean (°C) |
| Spring (March and April) | 38.14 | 20.69 |
| Dry Summer (May and June) | 45.63 | 29.11 |
| Wet Summer (July to September) | 42.36 | 28.72 |
| Autumn (October to November) | 35.42 | 19.29 |
| Winter (December to February) | 26.63 | 10.79 |
| Average Rainfall | 95.24 mm/year | |
| Physiographic Features | Indus River flows alongside the western boundary of the district | |

DEMOGRAPHY

| | | |
|-------------------|------------------|------------------|
| | Year-1998 | Year-2017 |
| Population | 1,102,584 | 1,613,506 |

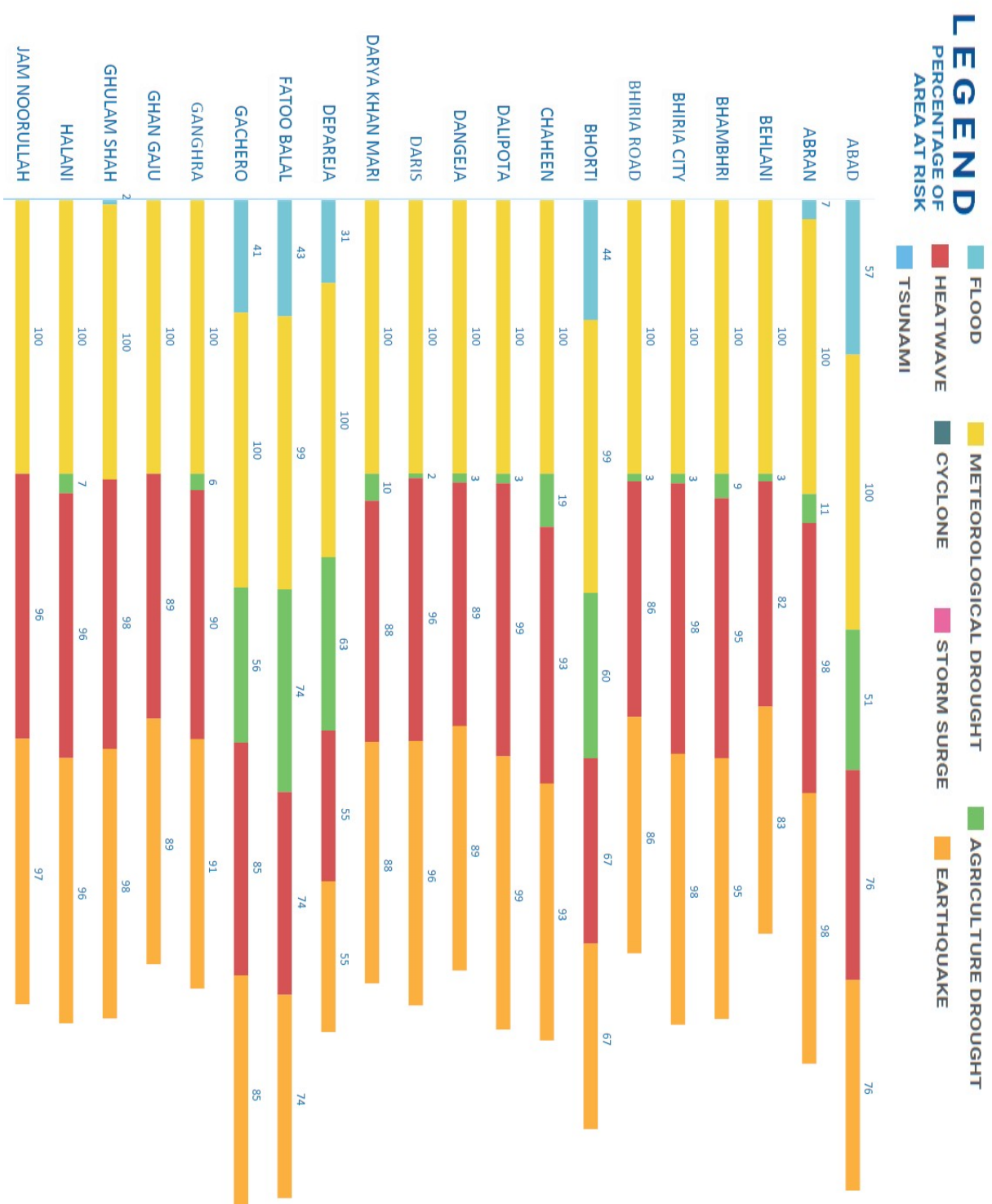
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|---|---------|-----------|
| Urban | 192,404 | 379,233 |
| Rural | 895,167 | 1,232,814 |
| No. of Household | - | 275,693 |
| Average Annual Growth Rate 1998-2017 | 2.09 % | |

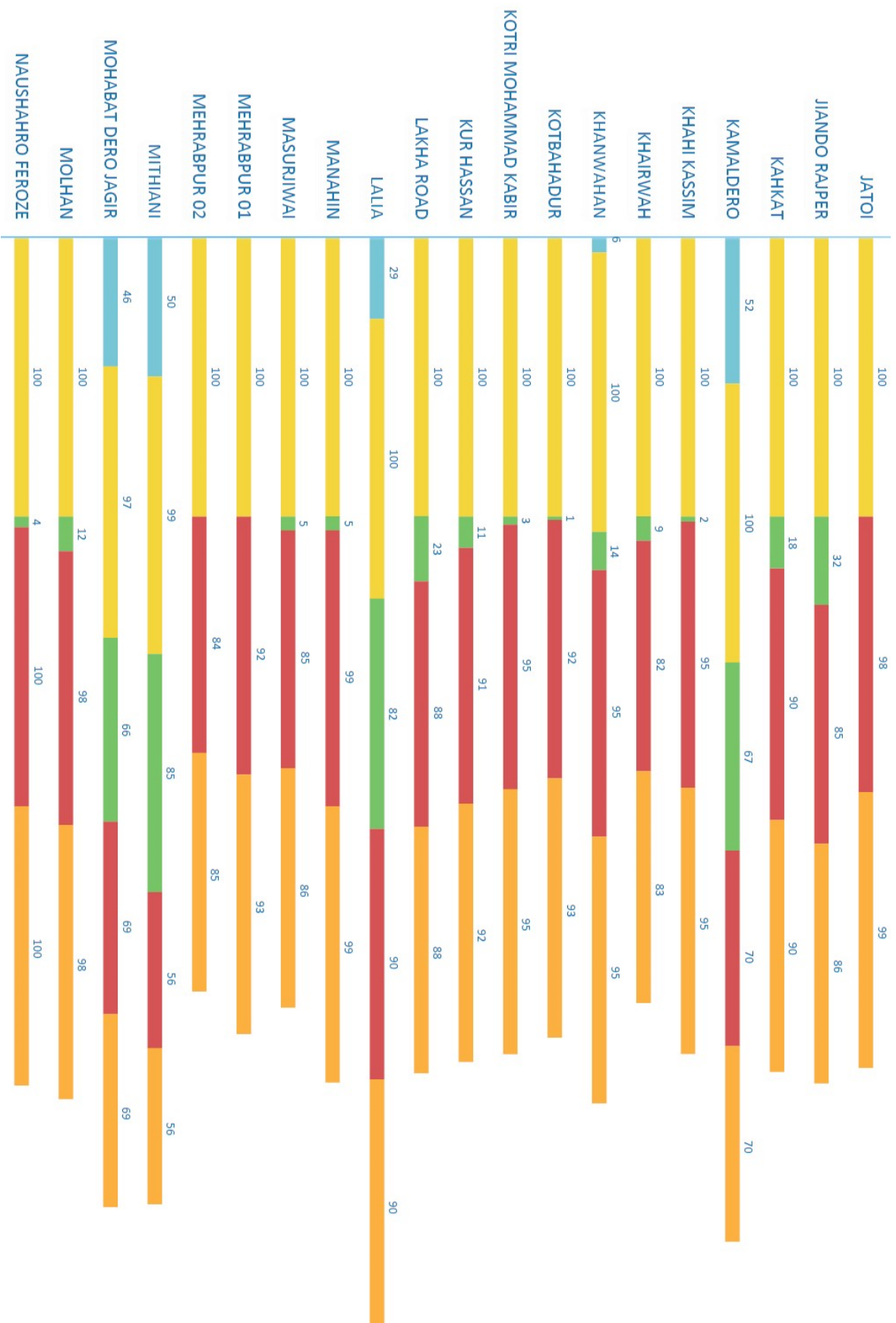
ECONOMY

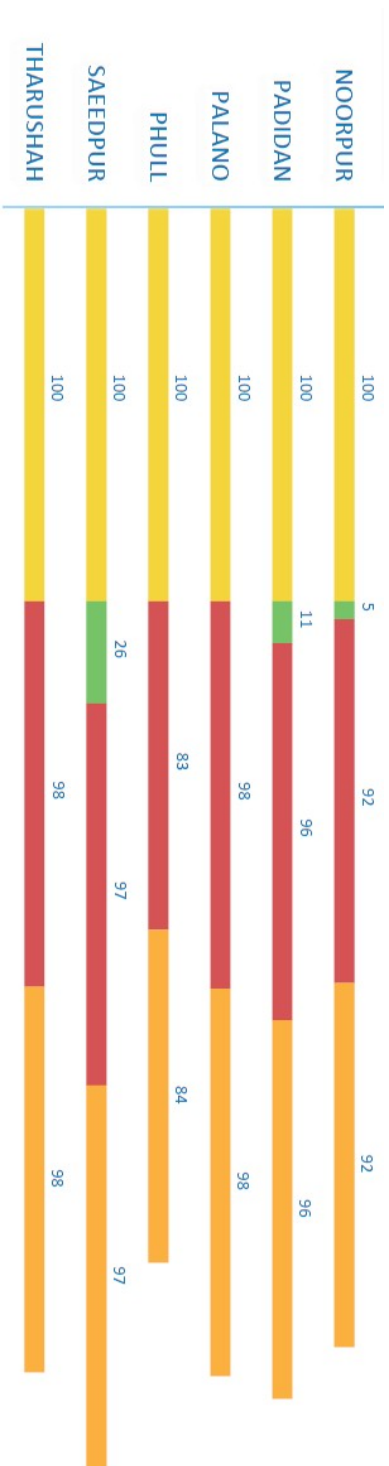
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| Industries | Mainly based on agriculture, sugar mills are most common because of large scale cultivation of sugarcane |
| Agriculture | Production in M.tons as per (2016-17) |
| Major Crops | |
| Wheat | 429,567 |
| Sugarcane | 1,339,028 |
| Rice | 36,864 |
| Minor Crops | |
| Jowar | 371 |
| Barley | 27 |
| Gram | 239 |
| Bajra | 10 |
| Rapeseed And Mustard | 931 |
| Sesame | 975 |
| Maize | 272 |
| Tobacco | 5 |

| TALUKA NAMES | UC NAMES |
|---|--|
| <ol style="list-style-type: none"> 1. Bhiria Taluka 2. Kandiaro Taluka 3. Mehrabpur Taluka 4. Moro Taluka 5. Naushahro Feroze Taluka | <ol style="list-style-type: none"> 1. Abad 2. Abran 3. Behlani 4. Bhambhri 5. Bhiria City 6. Bhiria Road 7. Bhorti 8. Chaheen 9. Dalipota 10. Dangeja 11. Daris 12. Darya Khan Mari 13. Depareja 14. Fattoo Balal 15. Gachero 16. Ganghra 17. Ghan Gaju 18. Ghulam Shah 19. Halani 20. Jam Noorullah 21. Jatoi 22. Jiando Rajper 23. Kahkat 24. Kamaldero 25. Khahi Kassim 26. Khairwah 27. Khanwahan 28. Kotbahadur 29. Kotri Mohammad Kabir 30. Kur Hassan 31. Lakha Road 32. Lalia 33. Manahin 34. Masurjiwai 35. Mehrabpur 01 36. Mehrabpur 02 37. Mithiani 38. Mohabat Dero Jagir 39. Molhan 40. Naushahro Feroze 41. Noorpur 42. Padidan 43. Palano 44. Phull 45. Saeedpur 46. Tharushah |

NAUSHAHRO FEROZE DISTRICT MULTI-HAZARD RISK PROFILES







UC WISE RISK PROFILE

| ABAD | | | |
|------------------------|-----------------|---|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 48.582 sq km |
| | | Natural Vegetation in Wet Areas | 0.131 sq km |
| | | Pakka Unplanned Area | 1.427 sq km |
| | | Health Facilities | 1 |
| | | Settlements | 41 |
| | | Irrigation and Drainage Network | 9.004 km |
| | | Road Network | 67.497 km |
| | | Population | 17211 |
| | | Household | 2821 |
| Meteorological Drought | Medium -Extreme | Settlements | 41 |
| | | Agriculture Area | 48.736 sq km |
| | | Natural Vegetation in Wet Areas | 11.155 sq km |
| | | Water Body | 1.095 sq km |
| | | Population | 13802 |
| | | Household | 2260 |
| Agricultural Drought | Low - Medium | Agriculture Area | 25.618 sq km |
| | | Natural Vegetation in Wet Areas | 14.018 sq km |
| | | Water Body | 0.483 sq km |
| | | Population | 82 |
| | | Household | 15 |
| Heatwave | Low - High | Settlements | 41 |
| | | Population | 13707 |
| | | Household | 2247 |
| | | Agriculture Area | 48.535 sq km |
| | | Pakka Unplanned Area | 1.431 sq km |
| Riverine Flood | Low - Extreme | Agriculture Area | 35.695 sq km |
| | | Natural Vegetation in Wet Areas | 0.751 sq km |
| | | Pakka Unplanned Area | 0.702 sq km |
| | | Settlements | 13 |
| | | Irrigation and Drainage Network | 3.554 km |
| | | Road Network | 40.797 km |
| | | Population | 8464 |
| | | Household | 1384 |
| Storm Surge | Nil | The UC falls out of vulnerable zone for Storm surge | |

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

| ABRAN | | | |
|-------------------------------|-----------------|---------------------------------|----------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 61.613 sq km |
| | | Forest Area | 0.002 sq km |
| | | Pakka Planned Area | 1.172 sq km |
| | | Pakka Unplanned Area | 3.193 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 7 |
| | | Health Facilities | 2 |
| | | Mobile Towers | 4 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 1 |
| | | Power Plants | 1 |
| | | Settlements | 127 |
| | | Irrigation and Drainage Network | 12.645 km |
| | | Road Network | 146.07 km |
| | | Population | 83008 |
| | | Household | 14732 |
| Meteorological Drought | Medium -Extreme | Settlements | 127 |
| | | Agriculture Area | 61.68 sq km |
| | | Forest Area | 0.032 sq km |
| | | Water Body | 0.192 sq km |
| | | Wet Area | 0.002 sq km |
| | | Population | 66558 |
| | | Household | 11802 |
| Agricultural Drought | Low - Medium | Agriculture Area | 7.593 sq km |
| | | Forest Area | 0.03 sq km |
| | | Water Body | 0.242 sq km |
| | | Wet Area | 0.000162 sq km |
| | | Population | 10087 |
| | | Household | 1817 |
| Heatwave | Low - High | Settlements | 127 |
| | | Population | 66211 |
| | | Household | 11745 |
| | | Agriculture Area | 61.583 sq km |
| | | Pakka Planned Area | 1.172 sq km |

| | | | |
|-----------------------|---------------|---|-------------|
| | | Pakka Unplanned Area | 3.2 sq km |
| Riverine Flood | Low - Extreme | Agriculture Area | 4.947 sq km |
| | | Pakka Unplanned Area | 0.001 sq km |
| | | Irrigation and Drainage Network | 1.152 km |
| | | Road Network | 1.568 km |
| | | Population | 17 |
| | | Household | 3 |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| BEHLANI | | | |
|-------------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 49.586 sq km |
| | | Natural Vegetation in Wet Areas | 0.288 sq km |
| | | Pakka Planned Area | 0.39 sq km |
| | | Pakka Unplanned Area | 1.993 sq km |
| | | Range Land | 0.02 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 5 |
| | | Health Facilities | 6 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 6 |
| | | Police Stations | 2 |
| | | Settlements | 83 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 39.247 km |
| | | Railway Line | 8.629 km |
| | | Road Network | 149.18 km |
| | | Population | 46838 |
| | | Household | 8302 |
| Meteorological Drought | Medium -Extreme | Settlements | 83 |
| | | Agriculture Area | 49.709 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.037 sq km |
| | | Natural Vegetation in Wet Areas | 5.778 sq km |
| | | Range Land | 0.395 sq km |
| | | Water Body | 4.579 sq km |
| | | Wet Area | 0.179 sq km |

| | | | |
|----------------------|------------|--|-------------|
| | | Population | 37507 |
| | | Household | 6651 |
| | | | |
| Agricultural Drought | Low | Settlements | 1 |
| | | Agriculture Area | 1.866 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.005 sq km |
| | | Range Land | 0.25 sq km |
| | | Water Body | 0.126 sq km |
| | | Population | 31 |
| | | Household | 5 |
| | | | |
| Heatwave | Low - High | Settlements | 81 |
| | | Population | 37193 |
| | | Household | 6594 |
| | | Agriculture Area | 49.53 sq km |
| | | Pakka Planned Area | 0.391 sq km |
| | | Pakka Unplanned Area | 1.997 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| BHAMBHRI | | | |
|-------------|------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 70.923 sq km |
| | | Forest Area | 0.007 sq km |
| | | Kachcha Area | 0.019 sq km |
| | | Pakka Unplanned Area | 2.838 sq km |
| | | Range Land | 0.114 sq km |
| | | Education Facilities | 3 |
| | | Health Facilities | 2 |
| | | Settlements | 123 |
| | | Irrigation and Drainage Network | 16.957 km |
| | | Railway Line | 8.924 km |
| | | Road Network | 168.72 km |
| | | Population | 40166 |
| | | Household | 6856 |
| | | | |

| | | | |
|------------------------|-----------------|--|-------------|
| Meteorological Drought | Medium -Extreme | Settlements | 123 |
| | | Agriculture Area | 71.04 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.778 sq km |
| | | Forest Area | 0.101 sq km |
| | | Range Land | 2.039 sq km |
| | | Water Body | 0.138 sq km |
| | | Wet Area | 0.191 sq km |
| | | Population | 32365 |
| | | Household | 5523 |
| | | | |
| Agricultural Drought | Low | Settlements | 2 |
| | | Agriculture Area | 6.138 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.009 sq km |
| | | Forest Area | 0.032 sq km |
| | | Range Land | 2.308 sq km |
| | | Water Body | 0.169 sq km |
| | | Wet Area | 0.002 sq km |
| | | Population | 433 |
| | | Household | 75 |
| | | | |
| Heatwave | Low - High | Settlements | 122 |
| | | Population | 32138 |
| | | Household | 5484 |
| | | Agriculture Area | 70.86 sq km |
| | | Kachcha Area | 0.019 sq km |
| | | Pakka Unplanned Area | 2.846 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| BHIRIA CITY | | | |
|--------------------|-------------|-------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 38.814 sq km |
| | | Forest Area | 0.004 sq km |
| | | Kachcha Area | 0.053 sq km |
| | | Pakka Unplanned Area | 1.471 sq km |
| | | Range Land | 0.012 sq km |

| | | | |
|------------------------|-----------------|--|----------------|
| | | Education Facilities | 4 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 2 |
| | | Settlements | 65 |
| | | Irrigation and Drainage Network | 8.108 km |
| | | Road Network | 106.904 km |
| | | Population | 23504 |
| | | Household | 4053 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 65 |
| | | Agriculture Area | 38.849 sq km |
| | | Forest Area | 0.045 sq km |
| | | Natural Vegetation in Wet Areas | 0.000189 sq km |
| | | Range Land | 0.137 sq km |
| | | Water Body | 0.341 sq km |
| | | Wet Area | 0.00022 sq km |
| | | Population | 18904 |
| | | Household | 3257 |
| | | | |
| Agricultural Drought | Low | Settlements | 1 |
| | | Agriculture Area | 1.785 sq km |
| | | Range Land | 0.007 sq km |
| | | Population | 88 |
| | | Household | 14 |
| | | | |
| Heatwave | Low - High | Settlements | 63 |
| | | Population | 18751 |
| | | Household | 3228 |
| | | Agriculture Area | 38.789 sq km |
| | | Kachcha Area | 0.053 sq km |
| | | Pakka Unplanned Area | 1.475 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| BHIRIA ROAD | | | |
|------------------------|-----------------|---|----------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 28.027 sq km |
| | | Natural Vegetation in Wet Areas | 0.036 sq km |
| | | Pakka Unplanned Area | 1.087 sq km |
| | | Range Land | 0.019 sq km |
| | | Education Facilities | 2 |
| | | Settlements | 36 |
| | | Population | 16202 |
| | | Household | 2798 |
| | | Irrigation and Drainage Network | 10.674 km |
| | | Railway Line | 5.107 km |
| | | Road Network | 90.68 km |
| Meteorological Drought | Medium -Extreme | Settlements | 36 |
| | | Agriculture Area | 28.113 sq km |
| | | Bare Area with sparse Natural Vegetation | 1.729 sq km |
| | | Natural Vegetation in Wet Areas | 0.768 sq km |
| | | Range Land | 0.44 sq km |
| | | Water Body | 1.242 sq km |
| | | Wet Area | 0.615 sq km |
| | | Population | 13020 |
| | | Household | 2248 |
| Agricultural Drought | Low | Agriculture Area | 0.557 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.002 sq km |
| | | Natural Vegetation in Wet Areas | 0.124 sq km |
| | | Range Land | 0.451 sq km |
| | | Water Body | 0.056 sq km |
| | | Wet Area | 0.000077 sq km |
| | | Population | 171 |
| | | Household | 29 |
| Heatwave | Low - High | Settlements | 36 |
| | | Population | 12931 |
| | | Household | 2231 |
| | | Agriculture Area | 27.989 sq km |
| | | Pakka Unplanned Area | 1.089 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |

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

| BHORTI | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 32.064 sq km |
| | | Forest Area | 0.01 sq km |
| | | Natural Vegetation in Wet Areas | 0.08 sq km |
| | | Pakka Unplanned Area | 1.238 sq km |
| | | Education Facilities | 3 |
| | | Settlements | 35 |
| | | Irrigation and Drainage Network | 6.61 km |
| | | Road Network | 42.801 km |
| | | Population | 14923 |
| | | Household | 2449 |
| Meteorological Drought | Medium -Extreme | Settlements | 35 |
| | | Agriculture Area | 32.172 sq km |
| | | Forest Area | 0.061 sq km |
| | | Natural Vegetation in Wet Areas | 11.59 sq km |
| | | Water Body | 0.357 sq km |
| | | Population | 11962 |
| | | Household | 1962 |
| Agricultural Drought | Low - High | Agriculture Area | 20.727 sq km |
| | | Natural Vegetation in Wet Areas | 14.491 sq km |
| | | Water Body | 0.066 sq km |
| Heatwave | Low - High | Settlements | 34 |
| | | Population | 11894 |
| | | Household | 1952 |
| | | Agriculture Area | 32.024 sq km |
| | | Pakka Unplanned Area | 1.241 sq km |
| Riverine Flood | Low - Extreme | Agriculture Area | 19.983 sq km |
| | | Forest Area | 0.002 sq km |
| | | Natural Vegetation in Wet Areas | 1.554 sq km |
| | | Pakka Unplanned Area | 0.14 sq km |
| | | Settlements | 2 |
| | | Road Network | 9.131 km |
| | | Population | 1683 |
| | | Household | 275 |

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

| CHAHEEN | | | |
|-------------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 73.172 sq km |
| | | Forest Area | 0.014 sq km |
| | | Natural Vegetation in Wet Areas | 0.002 sq km |
| | | Pakka Planned Area | 1.484 sq km |
| | | Pakka Unplanned Area | 2.159 sq km |
| | | Range Land | 0.011 sq km |
| | | Bridges | 1 |
| | | Education Facilities | 7 |
| | | Health Facilities | 2 |
| | | Industries | 1 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 4 |
| | | Settlements | 116 |
| | | Irrigation and Drainage Network | 23.327 km |
| | | Railway Line | 6.175 km |
| | | Road Network | 216.878 km |
| | | Population | 57527 |
| | | Household | 9937 |
| Meteorological Drought | Medium -Extreme | Settlements | 116 |
| | | Agriculture Area | 73.322 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.229 sq km |
| | | Forest Area | 0.19 sq km |
| | | Natural Vegetation in Wet Areas | 0.072 sq km |
| | | Range Land | 0.233 sq km |
| | | Water Body | 2.888 sq km |
| | | Wet Area | 0.789 sq km |
| | | Population | 46257 |
| | | Household | 7982 |
| Agricultural Drought | Low - Medium | Settlements | 5 |
| | | Agriculture Area | 18.512 sq km |
| | | Forest Area | 0.232 sq km |
| | | Natural Vegetation in Wet Areas | 0.003 sq km |
| | | Range Land | 0.218 sq km |

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|----------------|------------|--|--------------|
| | | Water Body | 0.655 sq km |
| | | Wet Area | 0.041 sq km |
| | | Population | 3340 |
| | | Household | 575 |
| | | | |
| Heatwave | Low - High | Settlements | 112 |
| | | Population | 45899 |
| | | Household | 7921 |
| | | Agriculture Area | 73.099 sq km |
| | | Pakka Planned Area | 1.486 sq km |
| | | Pakka Unplanned Area | 2.165 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| DALIPOTA | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 30.706 sq km |
| | | Forest Area | 0.003 sq km |
| | | Pakka Unplanned Area | 1.557 sq km |
| | | Bridges | 1 |
| | | Education Facilities | 4 |
| | | Health Facilities | 1 |
| | | Settlements | 68 |
| | | Irrigation and Drainage Network | 10.596 km |
| | | Road Network | 87.286 km |
| | | Population | 21507 |
| | | Household | 3681 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 68 |
| | | Agriculture Area | 30.727 sq km |
| | | Forest Area | 0.015 sq km |
| | | Population | 17275 |
| | | Household | 2957 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 1 |
| | | Agriculture Area | 1.41 sq km |
| | | Population | 265 |
| | | Household | 44 |

| | | | |
|----------------|------------|--|-------------|
| | | | |
| Heatwave | Low - High | Settlements | 67 |
| | | Population | 17183 |
| | | Household | 2939 |
| | | Agriculture Area | 30.69 sq km |
| | | Pakka Unplanned Area | 1.562 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| DANGEJA | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 74.321 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.101 sq km |
| | | Pakka Unplanned Area | 3.172 sq km |
| | | Range Land | 0.115 sq km |
| | | Education Facilities | 7 |
| | | Health Facilities | 1 |
| | | Police Stations | 1 |
| | | Settlements | 124 |
| | | Irrigation and Drainage Network | 20.354 km |
| | | Road Network | 198.245 km |
| | | Population | 43552 |
| | | Household | 7487 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 124 |
| | | Agriculture Area | 74.494 sq km |
| | | Forest Area | 0.068 sq km |
| | | Natural Vegetation in Wet Areas | 2.434 sq km |
| | | Range Land | 2.847 sq km |
| | | Water Body | 0.687 sq km |
| | | Wet Area | 3.406 sq km |
| | | Population | 35035 |
| | | Household | 6020 |
| | | | |
| Agricultural Drought | Low | Agriculture Area | 2.062 sq km |
| | | Range Land | 1.489 sq km |
| | | Wet Area | 0.001 sq km |

| | | | |
|----------------|------------|--|--------------|
| | | Population | 344 |
| | | Household | 59 |
| | | | |
| Heatwave | Low - High | Settlements | 120 |
| | | Population | 34803 |
| | | Household | 5975 |
| | | Agriculture Area | 74.238 sq km |
| | | Pakka Unplanned Area | 3.177 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| DARIS | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 41.343 sq km |
| | | Forest Area | 0.002 sq km |
| | | Pakka Planned Area | 0.255 sq km |
| | | Pakka Unplanned Area | 0.688 sq km |
| | | Range Land | 0.022 sq km |
| | | Bridges | 1 |
| | | Petrol Pumps | 8 |
| | | Police Stations | 1 |
| | | Settlements | 50 |
| | | Irrigation and Drainage Network | 12.927 km |
| | | Road Network | 98.907 km |
| | | Population | 14944 |
| | | Household | 2721 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 50 |
| | | Agriculture Area | 41.404 sq km |
| | | Forest Area | 0.049 sq km |
| | | Range Land | 0.819 sq km |
| | | Water Body | 0.017 sq km |
| | | Wet Area | 0.148 sq km |
| | | Population | 12123 |
| | | Household | 2206 |
| | | | |
| Agricultural Drought | Low - Medium | Agriculture Area | 0.198 sq km |
| | | Range Land | 0.674 sq km |

| | | | |
|----------------|------------|--|-----------------|
| | | Wet Area | 0.0000064 sq km |
| | | Population | 86 |
| | | Household | 15 |
| | | | |
| Heatwave | Low - High | Settlements | 50 |
| | | Population | 11957 |
| | | Household | 2179 |
| | | Agriculture Area | 41.309 sq km |
| | | Pakka Planned Area | 0.255 sq km |
| | | Pakka Unplanned Area | 0.689 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| DARYA KHAN MARI | | | |
|------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 84.935 sq km |
| | | Forest Area | 0.021 sq km |
| | | Natural Vegetation in Wet Areas | 0.005 sq km |
| | | Pakka Unplanned Area | 1.964 sq km |
| | | Range Land | 0.146 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 6 |
| | | Health Facilities | 2 |
| | | Mobile Towers | 4 |
| | | Police Stations | 1 |
| | | Settlements | 80 |
| | | Irrigation and Drainage Network | 41.743 km |
| | | Railway Line | 4.351 km |
| | | Road Network | 218.922 km |
| | | Population | 32276 |
| | | Household | 5408 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 80 |
| | | Agriculture Area | 85.187 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.411 sq km |
| | | Forest Area | 0.711 sq km |

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|----------------------|------------|--|--------------|
| | | Natural Vegetation in Wet Areas | 0.604 sq km |
| | | Range Land | 6.043 sq km |
| | | Water Body | 0.648 sq km |
| | | Wet Area | 3.622 sq km |
| | | Population | 26077 |
| | | Household | 4371 |
| | | | |
| Agricultural Drought | Low | Settlements | 2 |
| | | Agriculture Area | 5.759 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.002 sq km |
| | | Forest Area | 0.603 sq km |
| | | Range Land | 5.626 sq km |
| | | Water Body | 0.228 sq km |
| | | Wet Area | 0.026 sq km |
| | | Population | 189 |
| | | Household | 31 |
| | | | |
| Heatwave | Low - High | Settlements | 80 |
| | | Population | 25870 |
| | | Household | 4334 |
| | | Agriculture Area | 84.836 sq km |
| | | Pakka Unplanned Area | 1.97 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| DEPAREJA | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 38.496 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.033 sq km |
| | | Pakka Planned Area | 0.179 sq km |
| | | Pakka Unplanned Area | 1.42 sq km |
| | | Education Facilities | 4 |
| | | Health Facilities | 1 |
| | | Police Stations | 1 |
| | | Settlements | 36 |

| | | | |
|------------------------|-----------------|---|--------------|
| | | Irrigation and Drainage Network | 3.962 km |
| | | Road Network | 60.463 km |
| | | Population | 32578 |
| | | Household | 5939 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 36 |
| | | Agriculture Area | 38.643 sq km |
| | | Forest Area | 0.033 sq km |
| | | Natural Vegetation in Wet Areas | 16.942 sq km |
| | | Water Body | 0.665 sq km |
| | | Wet Area | 5.718 sq km |
| | | Population | 26280 |
| | | Household | 4792 |
| | | | |
| Agricultural Drought | Low - High | Agriculture Area | 27.042 sq km |
| | | Forest Area | 0.041 sq km |
| | | Natural Vegetation in Wet Areas | 20.808 sq km |
| | | Water Body | 0.835 sq km |
| | | Wet Area | 4.473 sq km |
| | | Population | 574 |
| | | Household | 103 |
| | | | |
| Heatwave | Low - High | Settlements | 35 |
| | | Population | 26085 |
| | | Household | 4757 |
| | | Agriculture Area | 38.442 sq km |
| | | Pakka Planned Area | 0.179 sq km |
| | | Pakka Unplanned Area | 1.426 sq km |
| | | | |
| Riverine Flood | Low - Extreme | Agriculture Area | 21.302 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 1.033 sq km |
| | | Pakka Unplanned Area | 0.069 sq km |
| | | Education Facilities | 1 |
| | | Police Stations | 1 |
| | | Road Network | 10.003 km |
| | | Population | 1405 |
| Household | 253 | | |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |

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

| FATOO BALAL | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 62.452 sq km |
| | | Forest Area | 0.002 sq km |
| | | Kachcha Area | 0.24 sq km |
| | | Natural Vegetation in Wet Areas | 0.067 sq km |
| | | Pakka Planned Area | 3.741 sq km |
| | | Pakka Unplanned Area | 1.739 sq km |
| | | Range Land | 0.001 sq km |
| | | Ambulance Services | 1 |
| | | Bridges | 1 |
| | | Bus Stops | 1 |
| | | Education Facilities | 17 |
| | | Grid Stations | 1 |
| | | Health Facilities | 8 |
| | | Mobile Towers | 14 |
| | | Petrol Pumps | 16 |
| | | Police Stations | 2 |
| | | Post Offices | 3 |
| | | Settlements | 38 |
| | | Irrigation and Drainage Network | 5.38 km |
| | | Road Network | 101.525 km |
| | | Population | 106770 |
| | | Household | 19009 |
| Meteorological Drought | Medium -Extreme | Settlements | 37 |
| | | Agriculture Area | 62.661 sq km |
| | | Forest Area | 0.069 sq km |
| | | Natural Vegetation in Wet Areas | 15.064 sq km |
| | | Range Land | 0.014 sq km |
| | | Water Body | 0.817 sq km |
| | | Population | 85850 |
| | | Household | 15281 |
| Agricultural Drought | Low - High | Settlements | 17 |
| | | Agriculture Area | 59.497 sq km |
| | | Forest Area | 0.085 sq km |
| | | Natural Vegetation in Wet Areas | 18.81 sq km |

| | | | |
|----------------|------------|---|--------------|
| | | Range Land | 0.017 sq km |
| | | Water Body | 1.021 sq km |
| | | Population | 11107 |
| | | Household | 2025 |
| | | | |
| Heatwave | Low - High | Settlements | 37 |
| | | Population | 85368 |
| | | Household | 15197 |
| | | Agriculture Area | 62.416 sq km |
| | | Kachcha Area | 0.241 sq km |
| | | Pakka Planned Area | 3.741 sq km |
| | | Pakka Unplanned Area | 1.741 sq km |
| | | | |
| Riverine Flood | Low - High | Agriculture Area | 38.262 sq km |
| | | Kachcha Area | 0.239 sq km |
| | | Natural Vegetation in Wet Areas | 1.04 sq km |
| | | Pakka Unplanned Area | 0.025 sq km |
| | | Education Facilities | 1 |
| | | Settlements | 6 |
| | | Road Network | 23.562 km |
| | | Population | 5385 |
| | | Household | 981 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| GACHERO | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 82.033 sq km |
| | | Kachcha Area | 0.244 sq km |
| | | Natural Vegetation in Wet Areas | 0.017 sq km |
| | | Pakka Planned Area | 0.468 sq km |
| | | Pakka Unplanned Area | 2.36 sq km |
| | | Range Land | 0.045 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 2 |
| | | Health Facilities | 1 |
| | | Petrol Pumps | 10 |
| | | Settlements | 54 |

| | | | |
|---------------------------------|-----------------|---|---------------|
| | | Irrigation and Drainage Network | 8.796 km |
| | | Road Network | 146.277 km |
| | | Population | 60778 |
| | | Household | 11021 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 54 |
| | | Agriculture Area | 82.248 sq km |
| | | Forest Area | 0.024 sq km |
| | | Natural Vegetation in Wet Areas | 7.103 sq km |
| | | Range Land | 0.852 sq km |
| | | Water Body | 0.031 sq km |
| | | Population | 49197 |
| | | Household | 8918 |
| | | | |
| Agricultural Drought | Low - High | Settlements | 18 |
| | | Agriculture Area | 52.05 sq km |
| | | Forest Area | 0.029 sq km |
| | | Natural Vegetation in Wet Areas | 8.869 sq km |
| | | Range Land | 1.002 sq km |
| | | Water Body | 0.037 sq km |
| | | Population | 18211 |
| | | Household | 3314 |
| | | | |
| Heatwave | Low - High | Settlements | 53 |
| | | Population | 48747 |
| | | Household | 8840 |
| | | Agriculture Area | 81.983 sq km |
| | | Kachcha Area | 0.244 sq km |
| | | Pakka Planned Area | 0.467 sq km |
| | | Pakka Unplanned Area | 2.368 sq km |
| | | Riverine Flood | Low - Extreme |
| Kachcha Area | 0.177 sq km | | |
| Natural Vegetation in Wet Areas | 0.739 sq km | | |
| Pakka Unplanned Area | 0.738 sq km | | |
| Range Land | 0.005 sq km | | |
| Education Facilities | 1 | | |
| Settlements | 14 | | |
| Road Network | 36.341 km | | |
| Population | 18647 | | |
| Household | 3398 | | |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |

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

| GANGHRA | | | |
|-------------------------------|-----------------|---|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 38.937 sq km |
| | | Natural Vegetation in Wet Areas | 0.014 sq km |
| | | Pakka Unplanned Area | 2.634 sq km |
| | | Bridges | 5 |
| | | Education Facilities | 1 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 4 |
| | | Settlements | 60 |
| | | Irrigation and Drainage Network | 30.592 km |
| | | Railway Line | 2.813 km |
| | | Road Network | 98.41 km |
| | | Population | 31763 |
| | | Household | 5217 |
| Meteorological Drought | Medium -Extreme | Settlements | 60 |
| | | Agriculture Area | 39.078 sq km |
| | | Natural Vegetation in Wet Areas | 0.253 sq km |
| | | Water Body | 1.543 sq km |
| | | Wet Area | 2.042 sq km |
| | | Population | 25499 |
| | | Household | 4184 |
| Agricultural Drought | Low | Agriculture Area | 2.835 sq km |
| | | Water Body | 0.619 sq km |
| | | Wet Area | 0.002 sq km |
| | | Population | 268 |
| | | Household | 45 |
| Heatwave | Low - High | Settlements | 59 |
| | | Population | 25304 |
| | | Household | 4156 |
| | | Agriculture Area | 38.877 sq km |
| | | Pakka Unplanned Area | 2.642 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |

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

| GHAN GAJU | | | |
|-------------------------------|-----------------|---|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 27.805 sq km |
| | | Natural Vegetation in Wet Areas | 0.054 sq km |
| | | Pakka Unplanned Area | 1.21 sq km |
| | | Range Land | 0.024 sq km |
| | | Education Facilities | 2 |
| | | Health Facilities | 1 |
| | | Settlements | 31 |
| | | Irrigation and Drainage Network | 10.636 km |
| | | Road Network | 82.651 km |
| | | Population | 18046 |
| | | Household | 3110 |
| Meteorological Drought | Medium -Extreme | Settlements | 31 |
| | | Agriculture Area | 27.879 sq km |
| | | Natural Vegetation in Wet Areas | 1.427 sq km |
| | | Range Land | 0.42 sq km |
| | | Water Body | 0.628 sq km |
| | | Wet Area | 1.077 sq km |
| | | Population | 14511 |
| | | Household | 2502 |
| Agricultural Drought | Low | Agriculture Area | 0.245 sq km |
| | | Wet Area | 0.002 sq km |
| | | Population | 3 |
| | | Household | 0 |
| Heatwave | Low - High | Settlements | 31 |
| | | Population | 14414 |
| | | Household | 2486 |
| | | Agriculture Area | 27.771 sq km |
| | | Pakka Unplanned Area | 1.213 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |

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

| GHULAM SHAH | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 39.012 sq km |
| | | Pakka Unplanned Area | 2.549 sq km |
| | | Range Land | 0.008 sq km |
| | | Bridges | 1 |
| | | Education Facilities | 5 |
| | | Petrol Pumps | 1 |
| | | Settlements | 70 |
| | | Irrigation and Drainage Network | 21.824 km |
| | | Railway Line | 0.966 km |
| | | Road Network | 86.148 km |
| | | Population | 30973 |
| | | Household | 5093 |
| Meteorological Drought | Medium -Extreme | Settlements | 70 |
| | | Agriculture Area | 39.056 sq km |
| | | Range Land | 0.082 sq km |
| | | Water Body | 0.158 sq km |
| | | Wet Area | 0.533 sq km |
| | | Population | 24840 |
| | | Household | 4084 |
| Agricultural Drought | Low | Agriculture Area | 0.217 sq km |
| | | Population | 103 |
| | | Household | 16 |
| Heatwave | Low - High | Settlements | 70 |
| | | Population | 24689 |
| | | Household | 4059 |
| | | Agriculture Area | 38.991 sq km |
| | | Pakka Unplanned Area | 2.559 sq km |
| Riverine Flood | Low - High | Agriculture Area | 0.865 sq km |
| | | Pakka Unplanned Area | 0.015 sq km |
| | | Settlements | 1 |

| | | | |
|-------------|-----|---|----------|
| | | Irrigation and Drainage Network | 0.003 km |
| | | Road Network | 0.01 km |
| | | Population | 176 |
| | | Household | 29 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| HALANI | | | |
|------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 66.971 sq km |
| | | Forest Area | 0.005 sq km |
| | | Natural Vegetation in Wet Areas | 0.026 sq km |
| | | Pakka Planned Area | 0.143 sq km |
| | | Pakka Unplanned Area | 2.77 sq km |
| | | Range Land | 0.015 sq km |
| | | Education Facilities | 6 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 5 |
| | | Settlements | 128 |
| | | Tourist Places | 1 |
| | | Irrigation and Drainage Network | 17.592 km |
| | | Railway Line | 6.351 km |
| | | Road Network | 147.322 km |
| | | Population | 38289 |
| | | Household | 6401 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 128 |
| | | Agriculture Area | 67.062 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.242 sq km |
| | | Forest Area | 0.017 sq km |
| | | Natural Vegetation in Wet Areas | 0.09 sq km |
| | | Range Land | 0.152 sq km |
| | | Water Body | 1.69 sq km |
| | | Wet Area | 0.089 sq km |
| | | Population | 30638 |
| | | Household | 5115 |
| | | | |

| | | | |
|----------------------|------------|--|---------------|
| Agricultural Drought | Low | Agriculture Area | 6.305 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.00032 sq km |
| | | Forest Area | 0.022 sq km |
| | | Range Land | 0.016 sq km |
| | | Water Body | 0.112 sq km |
| | | Population | 997 |
| | | Household | 167 |
| Heatwave | Low - High | Settlements | 128 |
| | | Population | 30420 |
| | | Household | 5072 |
| | | Agriculture Area | 66.922 sq km |
| | | Pakka Planned Area | 0.142 sq km |
| | | Pakka Unplanned Area | 2.775 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| JAM NOORULLAH | | | |
|----------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 38.307 sq km |
| | | Forest Area | 0.046 sq km |
| | | Pakka Planned Area | 2.289 sq km |
| | | Pakka Unplanned Area | 1.599 sq km |
| | | Bridges | 5 |
| | | Bus Stops | 1 |
| | | Education Facilities | 10 |
| | | Grid Stations | 1 |
| | | Health Facilities | 10 |
| | | Mobile Towers | 14 |
| | | Petrol Pumps | 7 |
| | | Police Stations | 2 |
| | | Settlements | 54 |
| | | Tourist Places | 2 |
| | | Irrigation and Drainage Network | 19.099 km |
| | | Railway Line | 4.262 km |
| | | Road Network | 72.308 km |
| | | Population | 57284 |

| | | | |
|-------------------------------|-----------------|--|--------------|
| | | Household | 8561 |
| Meteorological Drought | Medium -Extreme | Settlements | 54 |
| | | Agriculture Area | 38.36 sq km |
| | | Forest Area | 0.417 sq km |
| | | Water Body | 0.088 sq km |
| | | Population | 45758 |
| | | Household | 6841 |
| Agricultural Drought | Low | Agriculture Area | 0.104 sq km |
| | | Population | 27 |
| | | Household | 5 |
| Heatwave | Low - High | Settlements | 53 |
| | | Population | 45493 |
| | | Household | 6800 |
| | | Agriculture Area | 38.275 sq km |
| | | Pakka Planned Area | 2.29 sq km |
| | | Pakka Unplanned Area | 1.601 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| JATOI | | | |
|--------------------|-------------|---------------------------------|----------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 25.424 sq km |
| | | Forest Area | 0.000305 sq km |
| | | Pakka Planned Area | 0.562 sq km |
| | | Pakka Unplanned Area | 1.019 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 5 |
| | | Health Facilities | 2 |
| | | Police Stations | 1 |
| | | Settlements | 63 |
| | | Irrigation and Drainage Network | 12.909 km |
| | | Road Network | 61.565 km |
| | | Population | 31217 |
| | | Household | 5697 |

| | | | |
|-------------------------------|-----------------|--|---------------|
| Meteorological Drought | Medium -Extreme | Settlements | 63 |
| | | Agriculture Area | 25.448 sq km |
| | | Forest Area | 0.001 sq km |
| | | Water Body | 0.009 sq km |
| | | Population | 25107 |
| | | Household | 4581 |
| Agricultural Drought | Low | Agriculture Area | 0.00025 sq km |
| | | Forest Area | 0.001 sq km |
| | | Water Body | 0.011 sq km |
| | | Population | 572 |
| | | Household | 104 |
| Heatwave | Low - High | Settlements | 62 |
| | | Population | 24920 |
| | | Household | 4545 |
| | | Agriculture Area | 25.408 sq km |
| | | Pakka Planned Area | 0.562 sq km |
| | | Pakka Unplanned Area | 1.021 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| JIANDO RAJPER | | | |
|----------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 71.574 sq km |
| | | Natural Vegetation in Wet Areas | 0.001 sq km |
| | | Pakka Planned Area | 1.244 sq km |
| | | Pakka Unplanned Area | 2.773 sq km |
| | | Range Land | 0.029 sq km |
| | | Education Facilities | 12 |
| | | Grain Mandi | 1 |
| | | Health Facilities | 5 |
| | | Mobile Towers | 4 |
| | | Post Offices | 1 |
| | | Settlements | 86 |

| | | | |
|------------------------|-----------------|--|--------------|
| | | Irrigation and Drainage Network | 21.529 km |
| | | Railway Line | 11.574 km |
| | | Road Network | 187.849 km |
| | | Population | 68446 |
| | | Household | 11351 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 86 |
| | | Agriculture Area | 71.78 sq km |
| | | Bare Area with sparse Natural Vegetation | 7.565 sq km |
| | | Natural Vegetation in Wet Areas | 0.088 sq km |
| | | Range Land | 0.557 sq km |
| | | Water Body | 0.929 sq km |
| | | Wet Area | 2.994 sq km |
| | | Population | 54814 |
| | | Household | 9086 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 8 |
| | | Agriculture Area | 26.746 sq km |
| | | Bare Area with sparse Natural Vegetation | 5.484 sq km |
| | | Natural Vegetation in Wet Areas | 0.108 sq km |
| | | Range Land | 0.683 sq km |
| | | Water Body | 0.929 sq km |
| | | Wet Area | 0.836 sq km |
| | | Population | 4883 |
| | | Household | 816 |
| | | | |
| Heatwave | Low - High | Settlements | 86 |
| | | Population | 54398 |
| | | Household | 9020 |
| | | Agriculture Area | 71.475 sq km |
| | | Pakka Planned Area | 1.244 sq km |
| | | Pakka Unplanned Area | 2.781 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| KAHKAT | | | |
|------------------------|-----------------|---|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 64.582 sq km |
| | | Kachcha Area | 0.036 sq km |
| | | Pakka Planned Area | 0.022 sq km |
| | | Pakka Unplanned Area | 1.151 sq km |
| | | Range Land | 0.073 sq km |
| | | Education Facilities | 7 |
| | | Health Facilities | 2 |
| | | Settlements | 60 |
| | | Irrigation and Drainage Network | 17.506 km |
| | | Road Network | 141.002 km |
| | | Population | 23291 |
| | | Household | 4233 |
| Meteorological Drought | Medium -Extreme | Settlements | 60 |
| | | Agriculture Area | 64.705 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.106 sq km |
| | | Range Land | 4.669 sq km |
| | | Wet Area | 2.361 sq km |
| | | Population | 18878 |
| | | Household | 3430 |
| Agricultural Drought | Low - Medium | Settlements | 3 |
| | | Agriculture Area | 11.987 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.005 sq km |
| | | Range Land | 4.88 sq km |
| | | Wet Area | 0.03 sq km |
| | | Population | 665 |
| | | Household | 120 |
| Heatwave | Low - High | Settlements | 59 |
| | | Population | 18659 |
| | | Household | 3393 |
| | | Agriculture Area | 64.54 sq km |
| | | Kachcha Area | 0.036 sq km |
| | | Pakka Planned Area | 0.022 sq km |
| | | Pakka Unplanned Area | 1.152 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |

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

| KAMALDERO | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 72.269 sq km |
| | | Forest Area | 0.003 sq km |
| | | Kachcha Area | 0.284 sq km |
| | | Natural Vegetation in Wet Areas | 0.171 sq km |
| | | Pakka Unplanned Area | 1.642 sq km |
| | | Settlements | 61 |
| | | Irrigation and Drainage Network | 10.189 km |
| | | Road Network | 64.465 km |
| | | Population | 23222 |
| | | Household | 3816 |
| Meteorological Drought | Medium -Extreme | Settlements | 61 |
| | | Agriculture Area | 72.553 sq km |
| | | Forest Area | 0.109 sq km |
| | | Natural Vegetation in Wet Areas | 22.705 sq km |
| | | Water Body | 0.783 sq km |
| | | Population | 18587 |
| | | Household | 3051 |
| Agricultural Drought | Low - High | Agriculture Area | 58.918 sq km |
| | | Forest Area | 0.138 sq km |
| | | Natural Vegetation in Wet Areas | 28.412 sq km |
| | | Water Body | 0.974 sq km |
| | | Population | 313 |
| | | Household | 47 |
| Heatwave | Low - High | Settlements | 61 |
| | | Population | 18459 |
| | | Household | 3029 |
| | | Agriculture Area | 72.196 sq km |
| | | Kachcha Area | 0.284 sq km |
| | | Pakka Unplanned Area | 1.646 sq km |
| Riverine Flood | Low - Extreme | Agriculture Area | 52.57 sq km |
| | | Forest Area | 0.003 sq km |

| | | | |
|-------------|-----|---|-------------|
| | | Kachcha Area | 0.284 sq km |
| | | Natural Vegetation in Wet Areas | 2.468 sq km |
| | | Pakka Unplanned Area | 0.437 sq km |
| | | Settlements | 23 |
| | | Irrigation and Drainage Network | 0.068 km |
| | | Road Network | 30.517 km |
| | | Population | 8689 |
| | | Household | 1429 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| KHAHI KASSIM | | | |
|------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 57.032 sq km |
| | | Forest Area | 0.008 sq km |
| | | Natural Vegetation in Wet Areas | 0.001 sq km |
| | | Pakka Planned Area | 0.404 sq km |
| | | Pakka Unplanned Area | 3.179 sq km |
| | | Range Land | 0.033 sq km |
| | | Bridges | 2 |
| | | Bus Stops | 1 |
| | | Education Facilities | 8 |
| | | Grid Stations | 1 |
| | | Health Facilities | 6 |
| | | Mobile Towers | 6 |
| | | Petrol Pumps | 7 |
| | | Police Stations | 2 |
| | | Settlements | 96 |
| | | Irrigation and Drainage Network | 29.935 km |
| | | Road Network | 160.922 km |
| | | Population | 53815 |
| | | Household | 9247 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 96 |
| | | Agriculture Area | 57.13 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.387 sq km |
| | | Forest Area | 0.034 sq km |

| | | | |
|----------------------|------------|--|--------------|
| | | Natural Vegetation in Wet Areas | 0.275 sq km |
| | | Range Land | 0.729 sq km |
| | | Water Body | 0.866 sq km |
| | | Wet Area | 0.245 sq km |
| | | Population | 43174 |
| | | Household | 7420 |
| | | | |
| Agricultural Drought | Low | Agriculture Area | 1.272 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.002 sq km |
| | | Range Land | 0.234 sq km |
| | | Wet Area | 0.001 sq km |
| | | Population | 138 |
| | | Household | 24 |
| | | | |
| Heatwave | Low - High | Settlements | 96 |
| | | Population | 42895 |
| | | Household | 7367 |
| | | Agriculture Area | 56.983 sq km |
| | | Pakka Planned Area | 0.404 sq km |
| | | Pakka Unplanned Area | 3.184 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| KHAIRWAH | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 55.433 sq km |
| | | Natural Vegetation in Wet Areas | 0.046 sq km |
| | | Pakka Planned Area | 0.185 sq km |
| | | Pakka Unplanned Area | 1.056 sq km |
| | | Range Land | 0.168 sq km |
| | | Education Facilities | 5 |
| | | Health Facilities | 1 |
| | | Settlements | 67 |
| | | Irrigation and Drainage Network | 7.508 km |
| | | Road Network | 148.324 km |

| | | | |
|------------------------|-----------------|--|--------------|
| | | Population | 24894 |
| | | Household | 4532 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 67 |
| | | Agriculture Area | 55.603 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.286 sq km |
| | | Natural Vegetation in Wet Areas | 1.79 sq km |
| | | Range Land | 6.167 sq km |
| | | Water Body | 1.224 sq km |
| | | Wet Area | 2.506 sq km |
| | | Population | 20129 |
| | | Household | 3662 |
| Agricultural Drought | Low | Settlements | 2 |
| | | Agriculture Area | 2.689 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.005 sq km |
| | | Range Land | 4.581 sq km |
| | | Water Body | 0.202 sq km |
| | | Wet Area | 0.018 sq km |
| | | Population | 118 |
| | | Household | 21 |
| | | | |
| Heatwave | Low - High | Settlements | 65 |
| | | Population | 19986 |
| | | Household | 3636 |
| | | Agriculture Area | 55.368 sq km |
| | | Pakka Planned Area | 0.185 sq km |
| | | Pakka Unplanned Area | 1.061 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| KHANWAHAN | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 41.365 sq km |
| | | Forest Area | 0.007 sq km |
| | | Natural Vegetation in Wet Areas | 0.006 sq km |

| | | | |
|------------------------|-----------------|---|--------------|
| | | Pakka Unplanned Area | 2.308 sq km |
| | | Bridges | 2 |
| | | Education Facilities | 7 |
| | | Health Facilities | 2 |
| | | Police Stations | 1 |
| | | Settlements | 64 |
| | | Irrigation and Drainage Network | 17.18 km |
| | | Road Network | 93.138 km |
| | | Population | 27834 |
| | | Household | 4572 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 64 |
| | | Agriculture Area | 41.403 sq km |
| | | Forest Area | 0.337 sq km |
| | | Natural Vegetation in Wet Areas | 0.522 sq km |
| | | Wet Area | 0.045 sq km |
| | | Population | 22224 |
| | | Household | 3645 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 2 |
| | | Agriculture Area | 6.415 sq km |
| | | Forest Area | 0.421 sq km |
| | | Natural Vegetation in Wet Areas | 0.653 sq km |
| | | Population | 2293 |
| | | Household | 376 |
| | | | |
| Heatwave | Low - High | Settlements | 63 |
| | | Population | 22099 |
| | | Household | 3628 |
| | | Agriculture Area | 41.347 sq km |
| | | Pakka Unplanned Area | 2.314 sq km |
| | | | |
| Riverine Flood | Low - Extreme | Agriculture Area | 2.397 sq km |
| | | Natural Vegetation in Wet Areas | 0.13 sq km |
| | | Pakka Unplanned Area | 0.001 sq km |
| | | Road Network | 2.467 km |
| | | Population | 9 |
| | | Household | 1 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |

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

| KOTBAHADUR | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 48.254 sq km |
| | | Kachcha Area | 0.046 sq km |
| | | Natural Vegetation in Wet Areas | 0.008 sq km |
| | | Pakka Planned Area | 0.312 sq km |
| | | Pakka Unplanned Area | 2.042 sq km |
| | | Range Land | 0.006 sq km |
| | | Bridges | 5 |
| | | Education Facilities | 7 |
| | | Health Facilities | 4 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 5 |
| | | Settlements | 74 |
| | | Irrigation and Drainage Network | 16.741 km |
| | | Road Network | 117.412 km |
| | | Population | 34713 |
| | | Household | 5891 |
| Meteorological Drought | Medium -Extreme | Settlements | 74 |
| | | Agriculture Area | 48.396 sq km |
| | | Natural Vegetation in Wet Areas | 0.246 sq km |
| | | Range Land | 0.029 sq km |
| | | Water Body | 2.292 sq km |
| | | Wet Area | 0.904 sq km |
| | | Population | 27926 |
| | | Household | 4739 |
| Agricultural Drought | Low | Agriculture Area | 0.791 sq km |
| | | Range Land | 0.035 sq km |
| | | Population | 34 |
| | | Household | 4 |
| Heatwave | Low - High | Settlements | 74 |
| | | Population | 27656 |
| | | Household | 4692 |
| | | Agriculture Area | 48.189 sq km |
| | | Kachcha Area | 0.046 sq km |
| | | Pakka Planned Area | 0.311 sq km |

| | | | |
|-----------------------|-----|--|-------------|
| | | Pakka Unplanned Area | 2.048 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| KOTRI MOHAMMAD KABIR | | | |
|-----------------------------|-----------------|--|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 76.446 sq km |
| | | Forest Area | 0.005 sq km |
| | | Natural Vegetation in Wet Areas | 0.007 sq km |
| | | Pakka Planned Area | 0.7 sq km |
| | | Pakka Unplanned Area | 4.095 sq km |
| | | Range Land | 0.019 sq km |
| | | Bus Stops | 1 |
| | | Education Facilities | 15 |
| | | Health Facilities | 3 |
| | | Mobile Towers | 7 |
| | | Petrol Pumps | 6 |
| | | Police Stations | 2 |
| | | Settlements | 111 |
| | | Irrigation and Drainage Network | 27.695 km |
| | | Road Network | 187.455 km |
| | | Population | 62309 |
| | | Household | 10382 |
| Meteorological Drought | Medium -Extreme | Settlements | 111 |
| | | Agriculture Area | 76.579 sq km |
| | | Bare Area with sparse Natural Vegetation | 1.472 sq km |
| | | Forest Area | 0.293 sq km |
| | | Natural Vegetation in Wet Areas | 0.549 sq km |
| | | Range Land | 0.304 sq km |
| | | Water Body | 0.789 sq km |
| | | Wet Area | 0.195 sq km |
| | | Population | 49835 |
| | | Household | 8299 |
| Agricultural Drought | Low | Settlements | 2 |

| | | | |
|----------------|------------|--|--------------|
| | | Agriculture Area | 1.253 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.001 sq km |
| | | Forest Area | 0.304 sq km |
| | | Natural Vegetation in Wet Areas | 0.398 sq km |
| | | Range Land | 0.363 sq km |
| | | Water Body | 0.769 sq km |
| | | Wet Area | 0.011 sq km |
| | | Population | 1341 |
| | | Household | 219 |
| | | | |
| Heatwave | Low - High | Settlements | 111 |
| | | Population | 49454 |
| | | Household | 8241 |
| | | Agriculture Area | 76.379 sq km |
| | | Pakka Planned Area | 0.701 sq km |
| | | Pakka Unplanned Area | 4.103 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| KUR HASSAN | | | |
|--------------------|-------------|-------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 34.849 sq km |
| | | Forest Area | 0.022 sq km |
| | | Pakka Planned Area | 3.699 sq km |
| | | Pakka Unplanned Area | 1.886 sq km |
| | | Range Land | 0.002 sq km |
| | | Ambulance Services | 1 |
| | | Bridges | 2 |
| | | Bus Stops | 1 |
| | | Education Facilities | 14 |
| | | Grid Stations | 1 |
| | | Health Facilities | 11 |
| | | Mobile Towers | 16 |
| | | Petrol Pumps | 13 |
| | | Police Stations | 5 |
| | | Post Offices | 1 |

| | | | |
|------------------------|-----------------|--|--------------|
| | | Settlements | 67 |
| | | Irrigation and Drainage Network | 10.913 km |
| | | Road Network | 82.24 km |
| | | Population | 59982 |
| | | Household | 9959 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 67 |
| | | Agriculture Area | 34.947 sq km |
| | | Forest Area | 0.418 sq km |
| | | Range Land | 0.065 sq km |
| | | Wet Area | 1.006 sq km |
| | | Population | 48100 |
| | | Household | 7985 |
| | | | |
| Agricultural Drought | Low | Agriculture Area | 6.059 sq km |
| | | Forest Area | 0.066 sq km |
| | | Range Land | 0.078 sq km |
| | | Wet Area | 0.001 sq km |
| | | Population | 304 |
| | | Household | 52 |
| | | | |
| Heatwave | Low - High | Settlements | 67 |
| | | Population | 47833 |
| | | Household | 7944 |
| | | Agriculture Area | 34.801 sq km |
| | | Pakka Planned Area | 3.698 sq km |
| | | Pakka Unplanned Area | 1.891 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| LAKHA ROAD | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 79.011 sq km |
| | | Forest Area | 0.006 sq km |
| | | Natural Vegetation in Wet Areas | 0.011 sq km |
| | | Pakka Planned Area | 0.026 sq km |

| | | | |
|------------------------|-----------------|--|--------------|
| | | Pakka Unplanned Area | 2.923 sq km |
| | | Range Land | 0.455 sq km |
| | | Bridges | 1 |
| | | Bus Stops | 1 |
| | | Education Facilities | 7 |
| | | Health Facilities | 2 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 1 |
| | | Settlements | 127 |
| | | Population | 41713 |
| | | Household | 7079 |
| | | Irrigation and Drainage Network | 24.263 km |
| | | Railway Line | 14.636 km |
| | | Road Network | 214.246 km |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 127 |
| | | Agriculture Area | 79.255 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.2 sq km |
| | | Forest Area | 0.202 sq km |
| | | Natural Vegetation in Wet Areas | 0.357 sq km |
| | | Range Land | 8.782 sq km |
| | | Water Body | 0.83 sq km |
| | | Wet Area | 0.249 sq km |
| | | Population | 33488 |
| | | Household | 5682 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 6 |
| | | Agriculture Area | 15.543 sq km |
| | | Forest Area | 0.251 sq km |
| | | Natural Vegetation in Wet Areas | 0.443 sq km |
| | | Range Land | 10.853 sq km |
| | | Water Body | 0.125 sq km |
| | | Wet Area | 0.109 sq km |
| | | Population | 1911 |
| | | Household | 321 |
| Heatwave | Low - High | Settlements | 125 |
| | | Population | 33255 |
| | | Household | 5641 |
| | | Agriculture Area | 78.88 sq km |
| | | Pakka Planned Area | 0.026 sq km |
| | | Pakka Unplanned Area | 2.932 sq km |

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

| LALIA | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 37.9 sq km |
| | | Forest Area | 0.002 sq km |
| | | Natural Vegetation in Wet Areas | 0.018 sq km |
| | | Pakka Unplanned Area | 1.095 sq km |
| | | Range Land | 0.001 sq km |
| | | Settlements | 30 |
| | | Irrigation and Drainage Network | 11.85 km |
| | | Road Network | 63.203 km |
| | | Population | 22324 |
| | | Household | 4071 |
| Meteorological Drought | Medium -Extreme | Settlements | 30 |
| | | Agriculture Area | 37.933 sq km |
| | | Forest Area | 0.023 sq km |
| | | Natural Vegetation in Wet Areas | 2.102 sq km |
| | | Range Land | 0.026 sq km |
| | | Water Body | 0.023 sq km |
| | | Wet Area | 0.929 sq km |
| | | Population | 18035 |
| | | Household | 3288 |
| Agricultural Drought | Low - Medium | Settlements | 20 |
| | | Agriculture Area | 39.498 sq km |
| | | Forest Area | 0.028 sq km |
| | | Natural Vegetation in Wet Areas | 2.628 sq km |
| | | Range Land | 0.033 sq km |
| | | Water Body | 0.029 sq km |
| | | Wet Area | 0.623 sq km |
| | | Population | 12598 |
| | | Household | 2297 |

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|-----------------------|---------------|---|--------------|
| Heatwave | Low - High | Settlements | 30 |
| | | Population | 17919 |
| | | Household | 3269 |
| | | Agriculture Area | 37.89 sq km |
| | | Pakka Unplanned Area | 1.101 sq km |
| Riverine Flood | Low - Extreme | Agriculture Area | 12.625 sq km |
| | | Natural Vegetation in Wet Areas | 0.039 sq km |
| | | Pakka Unplanned Area | 0.097 sq km |
| | | Settlements | 4 |
| | | Road Network | 9.755 km |
| | | Population | 1983 |
| | | Household | 362 |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| MANAHIN | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 59.069 sq km |
| | | Forest Area | 0.003 sq km |
| | | Natural Vegetation in Wet Areas | 0.001 sq km |
| | | Pakka Planned Area | 0.091 sq km |
| | | Pakka Unplanned Area | 1.144 sq km |
| | | Bus Stops | 1 |
| | | Education Facilities | 3 |
| | | Health Facilities | 1 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 9 |
| | | Settlements | 67 |
| | | Irrigation and Drainage Network | 12.902 km |
| | | Road Network | 119.977 km |
| | | Population | 22281 |
| | | Household | 4043 |
| Meteorological Drought | Medium -Extreme | Settlements | 67 |
| | | Agriculture Area | 59.104 sq km |
| | | Forest Area | 0.029 sq km |

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|----------------------|------------|---|--------------|
| | | Natural Vegetation in Wet Areas | 0.008 sq km |
| | | Water Body | 0.344 sq km |
| | | Population | 17966 |
| | | Household | 3259 |
| | | | |
| Agricultural Drought | Low | Settlements | 4 |
| | | Agriculture Area | 3.628 sq km |
| | | Forest Area | 0.034 sq km |
| | | Population | 1613 |
| | | Household | 294 |
| Heatwave | Low - High | Settlements | 67 |
| | | Population | 17825 |
| | | Household | 3233 |
| | | Agriculture Area | 59.052 sq km |
| | | Pakka Planned Area | 0.09 sq km |
| | | Pakka Unplanned Area | 1.147 sq km |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| MASURJIWAI | | | |
|--------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 97.377 sq km |
| | | Forest Area | 0.013 sq km |
| | | Natural Vegetation in Wet Areas | 0.525 sq km |
| | | Pakka Planned Area | 0.001 sq km |
| | | Pakka Unplanned Area | 1.929 sq km |
| | | Range Land | 0.16 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 27 |
| | | Mobile Towers | 1 |
| | | Settlements | 73 |
| | | Irrigation and Drainage Network | 94.605 km |
| | | Road Network | 247.71 km |
| | | Population | 26007 |
| | | Household | 4478 |

| | | | |
|-------------------------------|-----------------|--|--------------|
| Meteorological Drought | Medium -Extreme | Settlements | 73 |
| | | Agriculture Area | 97.632 sq km |
| | | Bare Area with sparse Natural Vegetation | 1.056 sq km |
| | | Forest Area | 0.498 sq km |
| | | Natural Vegetation in Wet Areas | 9.056 sq km |
| | | Range Land | 3.776 sq km |
| | | Water Body | 0.007 sq km |
| | | Wet Area | 2.837 sq km |
| | | Population | 21122 |
| | | Household | 3628 |
| Agricultural Drought | Low | Agriculture Area | 3.384 sq km |
| | | Bare Area with sparse Natural Vegetation | 0.006 sq km |
| | | Forest Area | 0.576 sq km |
| | | Range Land | 3.276 sq km |
| | | Wet Area | 0.009 sq km |
| | | Population | 40 |
| | | Household | 6 |
| Heatwave | Low - High | Settlements | 72 |
| | | Population | 20867 |
| | | Household | 3594 |
| | | Agriculture Area | 97.278 sq km |
| | | Pakka Planned Area | 0.001 sq km |
| | | Pakka Unplanned Area | 1.935 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| MEHRABPUR 01 | | | |
|---------------------|-------------|---------------------------------|-------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 7.144 sq km |
| | | Natural Vegetation in Wet Areas | 0.006 sq km |
| | | Pakka Unplanned Area | 0.144 sq km |
| | | Education Facilities | 1 |

| | | | |
|------------------------|-----------------|---|-------------|
| | | Settlements | 10 |
| | | Irrigation and Drainage Network | 6.043 km |
| | | Railway Line | 2.188 km |
| | | Road Network | 22.861 km |
| | | Population | 2040 |
| | | Household | 345 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 10 |
| | | Agriculture Area | 7.155 sq km |
| | | Natural Vegetation in Wet Areas | 0.064 sq km |
| | | Water Body | 0.556 sq km |
| | | Population | 1647 |
| | | Household | 278 |
| | | | |
| Heatwave | Low - High | Settlements | 9 |
| | | Population | 1627 |
| | | Household | 276 |
| | | Agriculture Area | 7.138 sq km |
| | | Pakka Unplanned Area | 0.145 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Agriculture Drought | Nil | The UC falls out of vulnerable zone for Agriculture Drought | |

| MEHRABPUR 02 | | | |
|---------------------|-------------|-------------------------|-------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 5.402 sq km |
| | | Pakka Planned Area | 0.812 sq km |
| | | Pakka Unplanned Area | 0.292 sq km |
| | | Range Land | 0.004 sq km |
| | | Ambulance Services | 1 |
| | | Bridges | 1 |
| | | Education Facilities | 3 |
| | | Health Facilities | 4 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 1 |

| | | | |
|------------------------|-----------------|---|-------------|
| | | Police Stations | 1 |
| | | Settlements | 7 |
| | | Irrigation and Drainage Network | 7.051 km |
| | | Railway Line | 0.836 km |
| | | Road Network | 22.815 km |
| | | Population | 25904 |
| | | Household | 4185 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 7 |
| | | Agriculture Area | 5.427 sq km |
| | | Range Land | 0.036 sq km |
| | | Water Body | 0.943 sq km |
| | | Population | 20683 |
| | | Household | 3343 |
| | | | |
| Heatwave | Low - High | Settlements | 7 |
| | | Population | 20598 |
| | | Household | 3329 |
| | | Agriculture Area | 5.388 sq km |
| | | Pakka Planned Area | 0.815 sq km |
| | | Pakka Unplanned Area | 0.292 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Agriculture Drought | Nil | The UC falls out of vulnerable zone for Agriculture Drought | |

| MITHIANI | | | |
|--------------------|-------------|---------------------------------|-------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 46.26 sq km |
| | | Natural Vegetation in Wet Areas | 0.193 sq km |
| | | Pakka Unplanned Area | 0.702 sq km |
| | | Education Facilities | 1 |
| | | Settlements | 30 |
| | | Irrigation and Drainage Network | 1.517 km |
| | | Road Network | 41.485 km |
| | | Population | 9334 |

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|-------------------------------|-----------------|---|--------------|
| | | Household | 1597 |
| Meteorological Drought | Medium -Extreme | Settlements | 30 |
| | | Agriculture Area | 46.525 sq km |
| | | Natural Vegetation in Wet Areas | 25.458 sq km |
| | | Water Body | 0.268 sq km |
| | | Population | 7494 |
| | | Household | 1287 |
| Agricultural Drought | Low - Medium | Settlements | 3 |
| | | Agriculture Area | 50.654 sq km |
| | | Natural Vegetation in Wet Areas | 31.526 sq km |
| | | Water Body | 0.336 sq km |
| | | Population | 780 |
| | | Household | 134 |
| Heatwave | Low - High | Settlements | 30 |
| | | Population | 7456 |
| | | Household | 1279 |
| | | Agriculture Area | 46.178 sq km |
| | | Pakka Unplanned Area | 0.705 sq km |
| Riverine Flood | Low - High | Agriculture Area | 38.968 sq km |
| | | Natural Vegetation in Wet Areas | 3.225 sq km |
| | | Pakka Unplanned Area | 0.001 sq km |
| | | Road Network | 22.647 km |
| | | Population | 14 |
| | | Household | 1 |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| MOHABAT DERO JAGIR | | | |
|---------------------------|-------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 41.948 sq km |
| | | Natural Vegetation in Wet Areas | 0.073 sq km |
| | | Pakka Planned Area | 0.005 sq km |
| | | Pakka Unplanned Area | 1.628 sq km |

| | | | |
|------------------------|-----------------|---------------------------------|--------------|
| | | Range Land | 0.021 sq km |
| | | Education Facilities | 2 |
| | | Health Facilities | 2 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 1 |
| | | Settlements | 48 |
| | | Irrigation and Drainage Network | 11.66 km |
| | | Road Network | 49.072 km |
| | | Population | 19625 |
| | | Household | 3222 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 48 |
| | | Agriculture Area | 42.121 sq km |
| | | Natural Vegetation in Wet Areas | 9.442 sq km |
| | | Range Land | 0.762 sq km |
| | | Water Body | 1.022 sq km |
| | | Wet Area | 0.125 sq km |
| | | Population | 15698 |
| | | Household | 2576 |
| | | | |
| Agricultural Drought | Low - High | Settlements | 1 |
| | | Agriculture Area | 35.981 sq km |
| | | Natural Vegetation in Wet Areas | 11.903 sq km |
| | | Range Land | 0.94 sq km |
| | | Water Body | 1.291 sq km |
| | | Population | 152 |
| | | Household | 22 |
| | | | |
| Heatwave | Low - High | Settlements | 48 |
| | | Population | 15604 |
| | | Household | 2561 |
| | | Agriculture Area | 41.893 sq km |
| | | Pakka Planned Area | 0.005 sq km |
| | | Pakka Unplanned Area | 1.633 sq km |
| | | | |
| Riverine Flood | Low - Extreme | Agriculture Area | 28.276 sq km |
| | | Natural Vegetation in Wet Areas | 0.764 sq km |
| | | Pakka Unplanned Area | 0.257 sq km |
| | | Range Land | 0.02 sq km |
| | | Settlements | 10 |
| | | Road Network | 7.93 km |

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|-------------|-----|---|------|
| | | Population | 3098 |
| | | Household | 508 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| MOLHAN | | | |
|------------------------|-----------------|---|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 19.57 sq km |
| | | Forest Area | 0.001 sq km |
| | | Pakka Planned Area | 0.008 sq km |
| | | Pakka Unplanned Area | 1.005 sq km |
| | | Range Land | 0.015 sq km |
| | | Settlements | 49 |
| | | Irrigation and Drainage Network | 1.256 km |
| | | Road Network | 47.003 km |
| | | Population | 14994 |
| | | Household | 2586 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 49 |
| | | Agriculture Area | 19.602 sq km |
| | | Forest Area | 0.004 sq km |
| | | Range Land | 0.205 sq km |
| | | Population | 12047 |
| | | Household | 2081 |
| | | | |
| Agricultural Drought | Low | Agriculture Area | 3.083 sq km |
| | | Range Land | 0.189 sq km |
| | | Population | 258 |
| | | Household | 41 |
| | | | |
| Heatwave | Low - High | Settlements | 49 |
| | | Population | 11970 |
| | | Household | 2062 |
| | | Agriculture Area | 19.554 sq km |
| | | Pakka Planned Area | 0.008 sq km |
| | | Pakka Unplanned Area | 1.008 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |

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

| NAUSHAHRO FEROZE | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 32.127 sq km |
| | | Forest Area | 0.003 sq km |
| | | Pakka Unplanned Area | 2.135 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 12 |
| | | Grid Stations | 1 |
| | | Health Facilities | 4 |
| | | Mobile Towers | 3 |
| | | Petrol Pumps | 1 |
| | | Settlements | 73 |
| | | Irrigation and Drainage Network | 9.942 km |
| | | Road Network | 88.486 km |
| | | Population | 27844 |
| | | Household | 4688 |
| Meteorological Drought | Medium -Extreme | Settlements | 73 |
| | | Agriculture Area | 32.149 sq km |
| | | Forest Area | 0.054 sq km |
| | | Population | 22334 |
| | | Household | 3763 |
| Agricultural Drought | Low | Agriculture Area | 1.607 sq km |
| | | Forest Area | 0.027 sq km |
| | | Population | 291 |
| | | Household | 49 |
| Heatwave | Low - High | Settlements | 73 |
| | | Population | 22201 |
| | | Household | 3731 |
| | | Agriculture Area | 32.113 sq km |
| | | Pakka Unplanned Area | 2.14 sq km |
| Riverine Flood | Low – Medium | Agriculture Area | 0.241 sq km |
| | | Pakka Unplanned Area | 0.003 sq km |
| | | Settlements | 3 |

| | | | |
|-------------|-----|---|----------|
| | | Road Network | 0.162 km |
| | | Population | 40 |
| | | Household | 7 |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |

| NOORPUR | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 66.441 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.034 sq km |
| | | Pakka Planned Area | 0.179 sq km |
| | | Pakka Unplanned Area | 2.402 sq km |
| | | Education Facilities | 6 |
| | | Health Facilities | 1 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 3 |
| | | Police Stations | 1 |
| | | Settlements | 132 |
| | | Irrigation and Drainage Network | 18.209 km |
| | | Road Network | 136.588 km |
| | | Population | 34202 |
| | | Household | 5938 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 132 |
| | | Agriculture Area | 66.566 sq km |
| | | Forest Area | 0.014 sq km |
| | | Natural Vegetation in Wet Areas | 2.431 sq km |
| | | Water Body | 1.519 sq km |
| | | Wet Area | 1.668 sq km |
| | | Population | 27557 |
| | | Household | 4783 |
| | | | |
| Agricultural Drought | Low | Settlements | 1 |
| | | Agriculture Area | 4.314 sq km |
| | | Population | 369 |
| | | Household | 69 |
| | | | |

| | | | |
|----------------|------------|--|--------------|
| Heatwave | Low - High | Settlements | 130 |
| | | Population | 27341 |
| | | Household | 4748 |
| | | Agriculture Area | 66.391 sq km |
| | | Pakka Planned Area | 0.179 sq km |
| | | Pakka Unplanned Area | 2.409 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| PADIDAN | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 18.605 sq km |
| | | Forest Area | 0.006 sq km |
| | | Pakka Planned Area | 1.239 sq km |
| | | Pakka Unplanned Area | 1.352 sq km |
| | | Range Land | 0.004 sq km |
| | | Bridges | 1 |
| | | Bus Stops | 2 |
| | | Education Facilities | 7 |
| | | Grid Stations | 1 |
| | | Health Facilities | 6 |
| | | Mobile Towers | 6 |
| | | Petrol Pumps | 2 |
| | | Police Stations | 1 |
| | | Settlements | 36 |
| | | Irrigation and Drainage Network | 6.543 km |
| | | Railway Line | 3.968 km |
| | | Road Network | 48.199 km |
| | | Population | 46886 |
| | | Household | 7821 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 36 |
| | | Agriculture Area | 18.636 sq km |
| | | Forest Area | 0.084 sq km |
| | | Range Land | 0.079 sq km |
| | | Water Body | 0.054 sq km |
| | | Population | 37709 |

| | | | |
|-----------------------------|------------|--|--------------|
| | | Household | 6287 |
| Agricultural Drought | Low | Agriculture Area | 2.785 sq km |
| | | Forest Area | 0.101 sq km |
| | | Range Land | 0.059 sq km |
| | | Water Body | 0.001 sq km |
| | | Population | 194 |
| | | Household | 33 |
| Heatwave | Low - High | Settlements | 35 |
| | | Population | 37429 |
| | | Household | 6241 |
| | | Agriculture Area | 18.586 sq km |
| | | Pakka Planned Area | 1.24 sq km |
| | | Pakka Unplanned Area | 1.354 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| PALANO | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 27.094 sq km |
| | | Pakka Planned Area | 0.938 sq km |
| | | Pakka Unplanned Area | 1.887 sq km |
| | | Education Facilities | 8 |
| | | Health Facilities | 6 |
| | | Mobile Towers | 5 |
| | | Petrol Pumps | 1 |
| | | Police Stations | 1 |
| | | Settlements | 69 |
| | | Irrigation and Drainage Network | 13.067 km |
| | | Road Network | 69.989 km |
| | | Population | 40552 |
| | | Household | 6739 |
| Meteorological Drought | Medium -Extreme | Settlements | 69 |
| | | Agriculture Area | 27.131 sq km |
| | | Wet Area | 0.066 sq km |
| | | Population | 32559 |

| | | | |
|----------------------------|--------------|---|--------------|
| | | Household | 5408 |
| Heatwave | Low - High | Settlements | 69 |
| | | Population | 32324 |
| | | Household | 5373 |
| | | Agriculture Area | 27.072 sq km |
| | | Pakka Planned Area | 0.939 sq km |
| | | Pakka Unplanned Area | 1.893 sq km |
| Riverine Flood | Low - Medium | Agriculture Area | 0.079 sq km |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| Agriculture Drought | Nil | The UC falls out of vulnerable zone for Agriculture Drought | |

| PHULL | | | |
|-------------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 61.758 sq km |
| | | Forest Area | 0.001 sq km |
| | | Natural Vegetation in Wet Areas | 0.85 sq km |
| | | Pakka Planned Area | 0.094 sq km |
| | | Pakka Unplanned Area | 2.165 sq km |
| | | Range Land | 0.018 sq km |
| | | Bridges | 3 |
| | | Education Facilities | 3 |
| | | Mobile Towers | 1 |
| | | Petrol Pumps | 2 |
| | | Settlements | 127 |
| | | Irrigation and Drainage Network | 73.118 km |
| | | Road Network | 184.512 km |
| | | Population | 30706 |
| | | Household | 5283 |
| Meteorological Drought | Medium -Extreme | Settlements | 127 |
| | | Agriculture Area | 61.902 sq km |
| | | Forest Area | 0.006 sq km |
| | | Natural Vegetation in Wet Areas | 10.595 sq km |
| | | Range Land | 0.165 sq km |

| | | | |
|---------------------|------------|---|--------------|
| | | Water Body | 0.997 sq km |
| | | Wet Area | 0.834 sq km |
| | | Population | 24768 |
| | | Household | 4259 |
| | | | |
| Heatwave | Low - High | Settlements | 122 |
| | | Population | 24518 |
| | | Household | 4215 |
| | | Agriculture Area | 61.684 sq km |
| | | Pakka Planned Area | 0.094 sq km |
| | | Pakka Unplanned Area | 2.168 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Agriculture Drought | Nil | The UC falls out of vulnerable zone for Agriculture Drought | |

| SAEEDPUR | | | |
|------------------------|-----------------|---------------------------------|--------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 59.006 sq km |
| | | Forest Area | 0.011 sq km |
| | | Natural Vegetation in Wet Areas | 0.002 sq km |
| | | Pakka Unplanned Area | 2.364 sq km |
| | | Range Land | 0.032 sq km |
| | | Bridges | 1 |
| | | Bus Stops | 1 |
| | | Education Facilities | 8 |
| | | Health Facilities | 3 |
| | | Settlements | 84 |
| | | Irrigation and Drainage Network | 18.124 km |
| | | Road Network | 130.111 km |
| | | Population | 31394 |
| Household | 5259 | | |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 84 |
| | | Agriculture Area | 59.073 sq km |
| | | Forest Area | 0.427 sq km |

| | | | |
|-----------------------------|--------------|--|--------------|
| | | Natural Vegetation in Wet Areas | 0.197 sq km |
| | | Range Land | 0.587 sq km |
| | | Water Body | 0.407 sq km |
| | | Wet Area | 0.11 sq km |
| | | Population | 25183 |
| | | Household | 4213 |
| | | | |
| Agricultural Drought | Low - Medium | Settlements | 11 |
| | | Agriculture Area | 19.619 sq km |
| | | Forest Area | 0.159 sq km |
| | | Range Land | 0.692 sq km |
| | | Water Body | 0.039 sq km |
| | | Population | 1395 |
| | | Household | 231 |
| Heatwave | Low - High | Settlements | 83 |
| | | Population | 24999 |
| | | Household | 4181 |
| | | Agriculture Area | 58.977 sq km |
| | | Pakka Unplanned Area | 2.37 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |

| THARUSHAH | | | |
|------------------------|-----------------|---------------------------------|-------------|
| Hazard Type | Risk | Elements at Risk | |
| Earthquake | Low | Agriculture Area | 8.049 sq km |
| | | Forest Area | 0.005 sq km |
| | | Pakka Unplanned Area | 0.282 sq km |
| | | Bridges | 1 |
| | | Settlements | 7 |
| | | Irrigation and Drainage Network | 2.65 km |
| | | Road Network | 17.391 km |
| | | Population | 3831 |
| | | Household | 647 |
| | | | |
| Meteorological Drought | Medium -Extreme | Settlements | 7 |
| | | Agriculture Area | 8.06 sq km |

| | | | |
|---------------------|------------|---|-------------|
| | | Forest Area | 0.085 sq km |
| | | Water Body | 0.048 sq km |
| | | Wet Area | 0.06 sq km |
| | | Population | 3068 |
| | | Household | 518 |
| | | | |
| Heatwave | Low - High | Settlements | 7 |
| | | Population | 3053 |
| | | Household | 516 |
| | | Agriculture Area | 8.046 sq km |
| | | Pakka Unplanned Area | 0.282 sq km |
| | | | |
| Storm surge | Nil | The UC falls out of vulnerable zone for Storm Surge | |
| | | | |
| Tsunami | Nil | The UC falls out of vulnerable zone for Tsunami | |
| | | | |
| Cyclone | Nil | The UC falls out of vulnerable zone for Cyclone | |
| | | | |
| Riverine Flood | Nil | The UC falls out of vulnerable zone for Riverine Flood | |
| | | | |
| Agriculture Drought | Nil | The UC falls out of vulnerable zone for Agriculture Drought | |

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.

Table 2: District Disaster Management Authority

| 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 |

| | | |
|-----|--|-----------|
| 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 |

Table 4: UCDMC Union Council Disaster Management Committee

| 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 |

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 pre-disaster 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.
9. 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 field 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 DDMA

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 Naushahro Feroze 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 | <ol style="list-style-type: none">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 Naushahro Feroze adjoining river Indus are likely to be affected due to breaches in embankments of river Indus.3. It is highly recommended to identify and reinforce sections of vulnerable embankments before flooding season to avoid breaches in embankments and consequential damages.4. As far as riverine floods are concerned, the Sindh province has sufficient time for preparation and reaction. Close monitoring of river discharge |
|-----------------------|---|

| | |
|-------------------|--|
| | <p>level in coordination with irrigation department, the government of Punjab, Federal Flood Commission and Pakistan Meteorological Department (PMD) be conducted.</p> <ol style="list-style-type: none"> Timely alerts be issued to people living in low lying areas within flood plain. In case of high anticipated flows evacuation of people and livestock be carried out. Soaking and compacting of embankments before arrival of flood water. Reinforcement and stone pitching of high-risk embankments. Use alternative eco-friendly options like use of bamboo wood etc. to minimize erosion impact on high-risk embankments. Where necessary and possible, erection of guide embankments and spur before arrival of high flood water. 24/7 vigilance of high-risk embankments by Sindh Irrigation Department. Readily availability of breach filling stock and machinery at high risk embankments. Restoration of natural eco-system within flood plain such as revival of braided/Yazoo channels and natural lakes within flood plain to disperse and distribute flood water across the plain. Removal of possible congestion factors within the flood plain. Public participation comprising local people be encouraged in pre and during flood periods. |
| Earthquake | <ol style="list-style-type: none"> 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 Naushahro Feroze falls away from any major fault line and is unlikely to be affected by a massive earthquake. Some of prominent faults situated in Sindh are (a) Karachi-Jati, (b) |

| | |
|-----------------|--|
| | <p>Surjan-Jhimpir, (c) Pab Fault (d) Hub Fault and (e) Allah Bund-Rann of Kutch faults.</p> <ol style="list-style-type: none"> 3. Though risk of geophysical hazards in Naushahro Feroze district is low but still some actions must be taken to avoid losses in case of minor jolts. It is highly recommended to identify old and weak buildings in the city and other urban settings of the district. Local concerned authorities may decide evacuation or retrofitting of such buildings / structures. 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 Naushahro Feroze district is situated. 5. Local government departments must be strengthened to manage situation arisen from earthquake jolts. Strengthening must include capacity building to act as first responder in any likely situation. |
| Heatwave | <ol style="list-style-type: none"> 1. The district has witnessed rapidly increased severity of heatwave in the past five years. The district is moderately populated, which significantly increases the chances of heatwave 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 alerts 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 government functionaries, NGOs, community and individual levels. 4. Additionally, introduction of reduced Urban Heat Islands (UHI) through policies and implementation in infrastructure development will significantly reduce impacts of heatwaves. |
| Drought | <ol style="list-style-type: none"> 1. Naushahro Feroze is a moderately populated district with closely |

| | |
|----------------|---|
| | <p>spaced homes in major cities. Climatic condition of the district can be categorized as Hot and Arid (Climate Classification of Pakistan (Khan et al., 2010). Average annual rainfall received during a year across the district is 95.24 mm. Agriculture is practiced in the district which is mainly dependent on canal irrigation.</p> <p>2. Drought is also forecastable hazard and can be predicted well in advance. Though drought may not bring any prominent or 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.</p> <p>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.</p> |
| Cyclone | According to MHVRA Study 2022, there is no Cyclone Hazard in Naushahro Feroze district. |
| Tsunami | According to MHVRA Study 2022, there is no Tsunami Hazard in Naushahro Feroze 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:

Table 5: Action Plan for Flood Hazard Management

| 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 |

| | | |
|--|-------------------------|---|
| 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 forecasting and monitoring of heatwave | Based on forecast | PDMA |
| Dissemination of forecast to | Based on forecast | PDMA |

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

Table 7: Action Plan for Drought Hazard Management

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

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 resources for rescue and recovery | Post disaster | PDMA and DDMA |

| | | |
|---|---------------|---------------|
| 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 Naushahro Feroze 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 (14) | Abad, Abran, Bharti, Depareja, Fatooh Balal, Gachero, Ghulam Shah, Kamaldero, Khanwahan, Lalia, Mithiani, Mohabat Dero Jagir, Naushahro Feroze, Palano |
| UCs not at Risk (32) | Behlani, Bhambhri, Bharia City, Bharia Road, Chaheen, Dalipota, Dangeja, Daris, Darya Khan Mari, Ganghra, Ghan Gaju, Halani, Jam Noorullah, Jatoi, Jiando Rajper, Kahkat, Khahi Kassim, Khairwah, Kotbahadur, Kotri Mohammad Kabir, Kur Hassan, Lakha Road, Manahin, Masurjiwai, Mehrabpur 01, Mehrabpur 02, Molhan, Noorpur, Padidan, Phull, Saeedpur, Tharushah |
| General Description | <ol style="list-style-type: none"> 1. District Naushahro Feroze is vulnerable to riverine floods and heavy rainfalls. 2. River Indus flows in the west of the district and makes the district vulnerable against flood hazard. 3. In 2010 flood, 10,000 households of the 10 union councils were affected in the district. 4. This district was also affected by rain/floods of 2011 and 2012. 5. In 2011 floods, 431 villages/settlements in all the 5 talukas were affected. Geographically 92% of the district was inundated and 44% of the sown area was affected due to 2011 flood. 6. Floods and heavy rainfalls also damaged and weakened, the protection Bund (linear levees along rivers and ring levees around cities), in the west of the district Naushahro Feroze. 7. The district has a well-established canal irrigation system. Rohri canal passes through the center of this district and irrigates the central and eastern parts of the district. Indus River passes alongside the western border of the district. 8. According to MHVRA study 2022, Flood hazard in the district is of intensity “Low to Very High”. 9. According to MHVRA study 2022, Flood risk in the district is “Low to Extreme”. |
| Disaster Management Measures | |
| Preparedness | |
| <ol style="list-style-type: none"> 1. Recording of daily river discharge at barrages in Sindh, and regular dissemination among stakeholders. 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. Inspection and readiness of flood fighting equipment available with district government departments prior to flooding season. 5. Classify and map bunds based on their origin (Mud, Brick, Stone, Concrete, Boulder, etc.) 6. Readiness of flood camps in high riverine flood and breaching risk areas. 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 | <ol style="list-style-type: none"> 1. An earthquake is a sudden shaking of the ground caused by two chunks of earth's crust sliding past one another. 2. District Naushahro Feroze falls away from any major fault line and is less likely to be affected by a massive earthquake. 3. Although earthquakes are short-lived, usually not lasting more than a minute, they can leave behind incredible damage. 4. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake. 5. 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. 6. According to MHVRA study 2022, Earthquake hazard in the district is of intensity "Low". 7. According to MHVRA study 2022, Earthquake risk in the district is "Low". |
| Disaster Management Measures | |
| Preparedness | |
| <ol style="list-style-type: none"> 1. Identifying and inventorying weak buildings and structures especially in urban settings of the district and situation demanding action by concerned departments. 2. Preparation of landuse plans, town plans and implementation of building codes in new residential schemes, schools, public and private offices. 3. Implementation of DRR measures in public infrastructure development schemes. 4. Establishment of search and rescue infrastructure and services which can be mobilized as first responder in post-earthquake situation. 5. Mobilize NGOs, INGOs, community development organizations and volunteers, and conduct earthquake safety awareness campaigns and drills especially in main urban settings. 6. Availability of necessary material and equipment required for establishing temporary shelters with life support facilities i.e. mobile medical camps, schools, power supply, water and sanitation etc. 7. Availability of alternative communication system in case if usual communication means are disturbed by earthquake. 8. Preparation of medical emergency plan to manage mass casualties in case of any major earthquake event. | |
| Response | |
| <ol style="list-style-type: none"> 1. Obtain firsthand information on intensity of earthquake and damages; prioritize areas for search and rescue operation. 2. Mobilize community-based volunteers, scouts and other trained personnel to hard hit areas to assess situation and help victims. 3. Establish emergency camps / shelters with necessary life support facilities. 4. Establish medical camps for provision of first aid and possible medical assistance to injured. 5. Evacuate people from damaged houses to safe places and shelters. 6. Provide security in affected areas and maintain law and order situation to prevent incidents of thefts and stampede. 7. Arrangement and conduct of aerial / drone survey of the affected areas. | |

8. Establish 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.

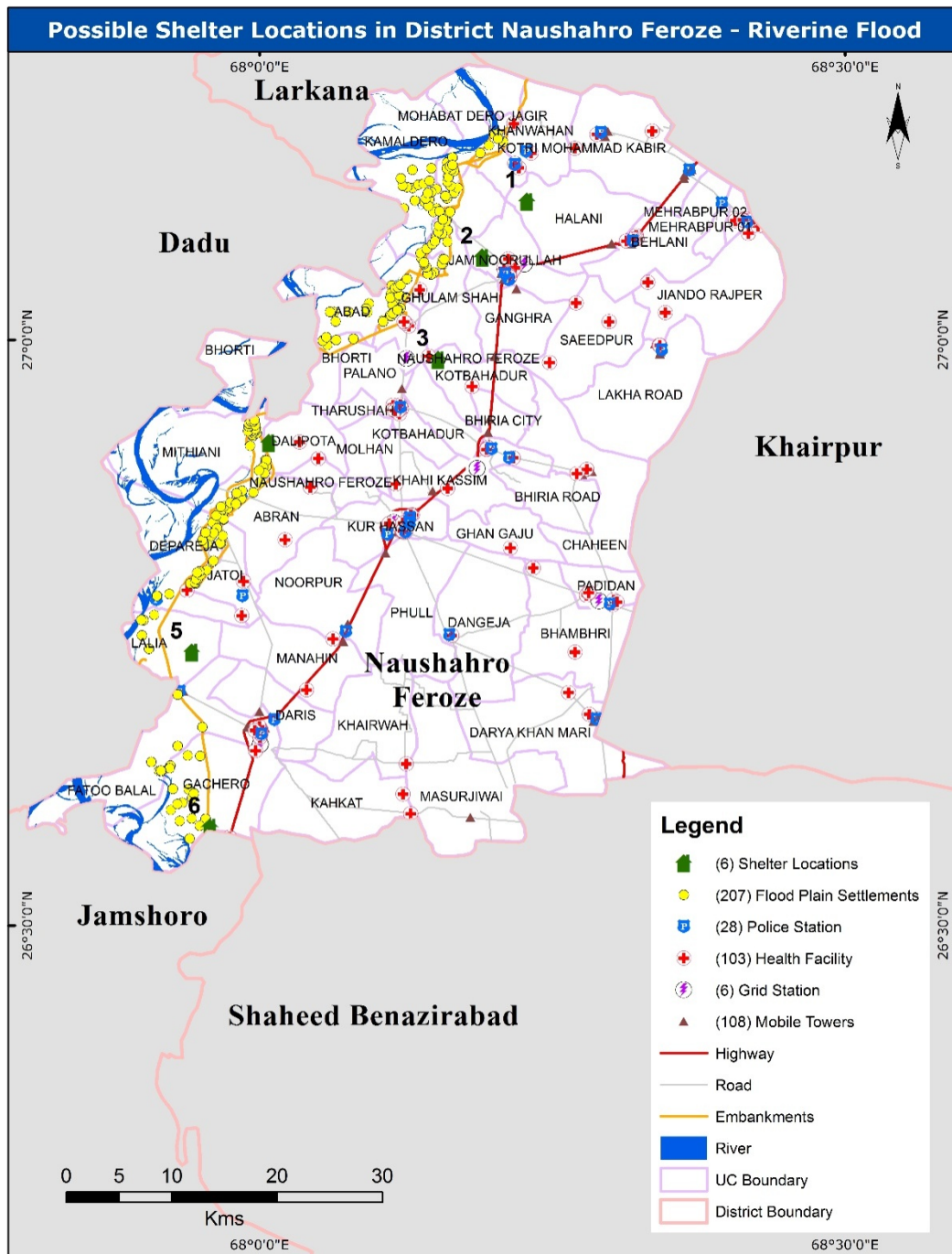
| Heatwave | |
|---|---|
| UCs at Risk | All UCs |
| General Description | <ol style="list-style-type: none"> 1. The climate of the district is extreme, both in winters and summers. 2. The months of May and June are very hot during the day with average maximum and minimum temperatures being 46 °C and 29 °C respectively. 3. December and January are the coldest months with average maximum and minimum temperature of 25.5 °C and 10 °C. 4. The extreme temperatures combined with high humidity and resultant atmospheric conditions adversely affect people living in district. 5. In 2015 heatwave, two people died in Naushahro Feroze 6. According to MHVRA study 2022, Heatwave hazard in the district is of intensity "Severe". 7. According to MHVRA study 2022, Heatwave risk in the district is "Low to High". |
| Disaster Management Measures | |
| Preparedness | |
| <ol style="list-style-type: none"> 1. Consistent future development strategy: Tree plantation, restoration of natural ecosystem, construction of environment friendly and well planned residential societies, offices, infrastructure and human dwellings. 2. Monitoring for hot weather alerts through local and international sources and issuance of timely Hot Day Advisories, and Hot Day Warnings. 3. Upgradation of major public health care facilities with necessary equipment and medicines to treat heatstroke patients. 4. Heatstroke awareness campaigns and wide public coverage through media, social media, SMS, NGOs and social welfare organizations. 5. Arrangements for uninterrupted supply of electricity and water in vulnerable areas. | |
| Response | |
| <ol style="list-style-type: none"> 1. Mobilization of NGOs, social welfare organization and volunteers for arranging heatstroke facilitation camps and distribution of fresh drinking water in affected areas. 2. Local radio FM broadcasts to disseminate heatstroke safety and precautions. 3. Mobilize mobile medical teams for first-aid and other medical emergency support in affected area. 4. Record keeping of heatwave patients and fatalities. | |
| Recovery and Rehabilitation | |
| <ol style="list-style-type: none"> 1. Post event review of heatwave plan and modifications if required. | |

| Cyclone/Tsunami | |
|---------------------|---|
| UCs at Risk | Nil |
| General Description | According to MHVRA study 2022, there is no risk of Cyclone/Tsunami in Naushahro Feroze district |

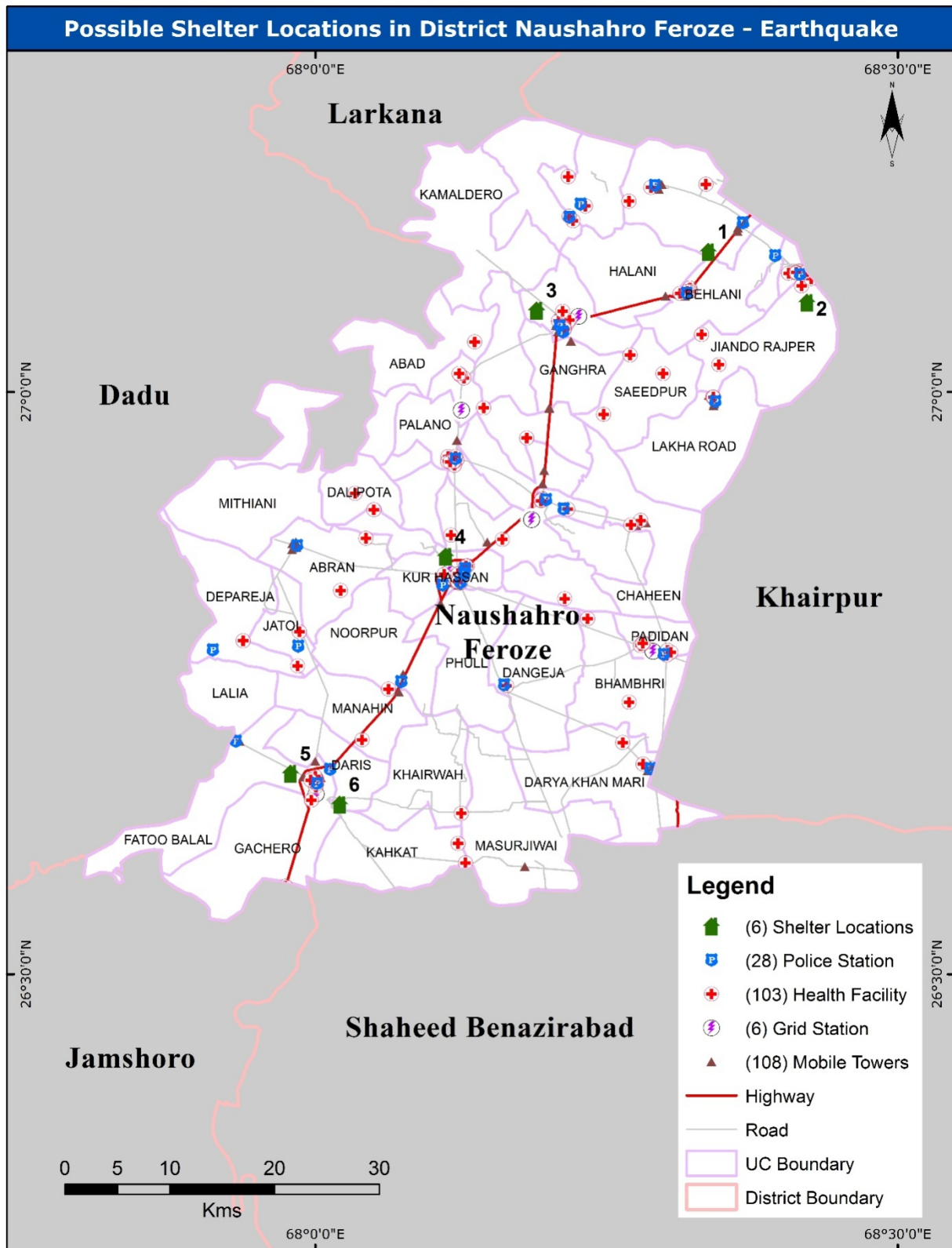
| Drought | |
|---|---|
| UCs at Risk | All UCs |
| General Description | <ol style="list-style-type: none"> 1. Climatic condition of the district can be categorized as Hot and Arid (Climate Classification of Pakistan (Khan et al., 2010)) 2. Average annual rainfall received during a year across the district is 95.24 mm. 3. River Indus is flowing along the western boundary of the district. 4. The district has a well-established canal irrigation system, Rohri canal passes through the center which irrigates most of the central and eastern areas, western areas are irrigated through River Indus. 5. Orchards are abundantly found across the district, mostly in the northern part. 6. According to MHVRA study 2022; <ol style="list-style-type: none"> a. Meteorological drought hazard for district Naushahro Feroze is “Extreme” b. Meteorological drought risk for district Naushahro Feroze is “Medium to Extreme” c. Agricultural drought hazard for district Naushahro Feroze is “Mild to Severe” d. Agricultural drought risk for district Naushahro Feroze is “Low to High” |
| Disaster Management Measures | |
| Preparedness | |
| <ol style="list-style-type: none"> 1. 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. Implementation of water supply and demand management and encouragement of efficient irrigation systems in agriculture. 3. Research and promote drought resistant agriculture crops. 4. Resilience and improvement of adaptive capacity of farmers. 5. Monitoring of temperature, precipitation, potential evapotranspiration, soil moisture, stream flow, groundwater levels, lakes, and reservoirs for drought forecasting. 6. Control ground water extraction from upper and lower aquifers to be within the sustainable yield limits. 7. Desalination of sea water and reuse of treated waste water. | |
| Response | |
| <ol style="list-style-type: none"> 1. Assess data about the nature of drought conditions and their impact. 2. Provision and installation of solar water pumps for availability of clean drinking water. 3. Public information campaign for water management and saving. | |
| Recovery and Rehabilitation | |
| <ol style="list-style-type: none"> 1. Cash and in-kind support to farmers for next cropping. 2. Awareness and encouragement of farmers on best irrigation practices and water saving. | |

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 Naushahro Feroze. PDMA may identify suitable partnering agencies / line departments to carry out and prioritize each proposed project.

| 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. |
| Earthquake | |
| 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. | <p>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.</p> <p>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.)</p> |

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.
2. 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 – NAUSHAHRO FEROZE DISTRICT

The existing nature of disasters in Naushahro Feroze 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 ranges from low to high. There is no risk of storm surge, and tsunami in the district. The risk of earthquake is determined to be low. As far as Heatwave is concerned Naushahro Feroze 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:

Table 10: Cost Benefit Analysis of Disaster Risk Measures in District Naushahro Feroze

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

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

ANNEX – A – VULNERABLE SETTLEMENTS PRONE TO RIVERINE FLOOD

List of Vulnerable Settlements (207) within flood Plains Prone to Riverine Flood

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|--------------------------|-----------|----------|--------------|
| 1 | Babar Khan Baghio | 67.932 | 26.589 | 2.96 |
| 2 | Bachal Pano Bachal | 68.161 | 27.094 | - |
| 3 | Beedan Seri | 67.964 | 26.846 | 10.83 |
| 4 | Bungar Khan Bhagio | 67.954 | 26.591 | 36.46 |
| 5 | Chaneja | 67.900 | 26.748 | 4.17 |
| 6 | Deparja | 67.941 | 26.792 | 37.30 |
| 7 | Fazil khan Baghio | 67.934 | 26.605 | 33.46 |
| 8 | Gachero | 67.942 | 26.609 | 53.10 |
| 9 | Goth Abra | 68.112 | 27.021 | 6.95 |
| 10 | Goth Alim | 68.166 | 27.126 | 12.08 |
| 11 | Goth Bakri | 68.160 | 27.152 | 20.15 |
| 12 | Goth Barkat Shah | 68.080 | 27.001 | - |
| 13 | Goth Dhani Bux Kaleri | 68.160 | 27.084 | 12.56 |
| 14 | Goth Dur Mohammad Bhatti | 68.145 | 27.120 | 20.43 |
| 15 | Goth Gopang | 68.092 | 27.024 | 9.62 |
| 16 | Goth Gopang | 68.112 | 27.040 | 3.74 |
| 17 | Goth Gul Hasan Dakhan | 68.151 | 27.129 | 5.20 |
| 18 | Goth Haji Kalhoro | 68.159 | 27.101 | 2.11 |
| 19 | Goth Hashim Kalhoro | 68.158 | 27.069 | 5.14 |
| 20 | Goth Imam Ali Maleesar | 68.151 | 27.112 | 27.38 |
| 21 | Goth Jatoi | 68.196 | 27.166 | 36.76 |
| 22 | Goth Kamal Dero | 68.159 | 27.107 | 24.45 |
| 23 | Goth Kaman Kalhoro | 68.143 | 27.078 | 4.65 |
| 24 | Goth Karim Bux Kalhorro | 68.143 | 27.057 | - |
| 25 | Goth Malkan | 67.912 | 26.781 | 50.21 |
| 26 | Goth Miran Khan | 68.138 | 27.074 | 22.36 |
| 27 | Goth Mohammad Ali Burdi | 68.122 | 27.037 | 4.73 |
| 28 | Goth Muhammad Qasim | 68.141 | 27.118 | 6.79 |
| 29 | Goth Murad Suhag | 68.115 | 27.032 | 11.37 |
| 30 | Goth Nizamuddin Tunio | 68.151 | 27.087 | 4.11 |
| 31 | Goth Old Salehpur | 68.156 | 27.065 | 10.41 |
| 32 | Goth Peliba | 67.960 | 26.844 | 6.82 |
| 33 | Goth Pipri | 68.138 | 27.070 | 10.14 |
| 34 | Goth Pir Mehdi Shah | 68.165 | 27.156 | 19.04 |

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|------------------------------|-----------|----------|--------------|
| 35 | Goth Purani Manjutha | 68.066 | 27.000 | 30.67 |
| 36 | Goth Qasim Chand | 68.149 | 27.058 | 11.29 |
| 37 | Goth Sanjer Khan Lashari | 68.208 | 27.169 | 3.23 |
| 38 | Goth Sirai Bhndhal Khan Sial | 68.113 | 27.047 | 33.01 |
| 39 | Goth Talib Kalhoro | 68.160 | 27.105 | 24.45 |
| 40 | Goth Yar Mohammad Kamdar | 68.093 | 27.031 | 15.04 |
| 41 | Hidayat Ullah Sehar | 67.940 | 26.574 | 39.10 |
| 42 | Izzat Kha Baghio | 67.939 | 26.616 | 15.85 |
| 43 | Izzat Khan Laghari | 67.924 | 26.599 | 25.75 |
| 44 | Jatoi | 67.955 | 26.826 | 50.91 |
| 45 | Jonalo | 67.906 | 26.736 | 10.18 |
| 46 | Khokhar | 67.951 | 26.670 | - |
| 47 | Miani | 68.006 | 26.897 | 15.31 |
| 48 | Mithiani | 67.981 | 26.869 | 197.46 |
| 49 | Sabab Abro | 68.106 | 27.016 | 25.91 |
| 50 | Sehra | 67.964 | 26.839 | 7.74 |
| 51 | That Goraho | 68.003 | 26.891 | 35.06 |
| 52 | Untitled Settlement | 67.963 | 26.839 | 10.49 |
| 53 | Untitled Settlement | 67.962 | 26.846 | 2.12 |
| 54 | Untitled Settlement | 68.006 | 26.892 | 1.12 |
| 55 | Untitled Settlement | 68.005 | 26.897 | 7.46 |
| 56 | Untitled Settlement | 68.106 | 27.017 | 11.35 |
| 57 | Untitled Settlement | 68.112 | 27.021 | 1.45 |
| 58 | Untitled Settlement | 68.156 | 27.065 | 3.60 |
| 59 | Untitled Settlement | 68.157 | 27.069 | 3.83 |
| 60 | Untitled Settlement | 68.143 | 27.078 | 3.29 |
| 61 | Untitled Settlement | 68.160 | 27.103 | 0.30 |
| 62 | Untitled Settlement | 67.985 | 26.865 | 18.66 |
| 63 | Untitled Settlement | 67.985 | 26.871 | 24.15 |
| 64 | Untitled Settlement | 68.123 | 27.112 | 4.73 |
| 65 | Untitled Settlement | 68.123 | 27.112 | 4.73 |
| 66 | Untitled Settlement | 67.949 | 26.585 | 5.91 |
| 67 | Untitled Settlement | 67.942 | 26.591 | 3.71 |
| 68 | Untitled Settlement | 67.930 | 26.604 | 2.46 |
| 69 | Untitled Settlement | 67.926 | 26.617 | 17.89 |
| 70 | Untitled Settlement | 67.914 | 26.632 | 8.07 |
| 71 | Untitled Settlement | 67.908 | 26.640 | 27.71 |

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|---------------------|-----------|----------|--------------|
| 72 | Untitled Settlement | 67.949 | 26.645 | 10.95 |
| 73 | Untitled Settlement | 67.939 | 26.645 | 18.34 |
| 74 | Untitled Settlement | 67.930 | 26.653 | 20.52 |
| 75 | Untitled Settlement | 67.930 | 26.697 | 6.67 |
| 76 | Untitled Settlement | 67.901 | 26.761 | 1.85 |
| 77 | Untitled Settlement | 67.899 | 26.761 | 5.30 |
| 78 | Untitled Settlement | 67.910 | 26.765 | 11.08 |
| 79 | Untitled Settlement | 67.923 | 26.783 | 9.29 |
| 80 | Untitled Settlement | 67.945 | 26.792 | 5.58 |
| 81 | Untitled Settlement | 67.945 | 26.793 | 0.47 |
| 82 | Untitled Settlement | 67.947 | 26.796 | 2.12 |
| 83 | Untitled Settlement | 67.946 | 26.796 | 2.44 |
| 84 | Untitled Settlement | 67.950 | 26.799 | 1.47 |
| 85 | Untitled Settlement | 67.955 | 26.804 | 1.55 |
| 86 | Untitled Settlement | 67.949 | 26.802 | 8.54 |
| 87 | Untitled Settlement | 67.960 | 26.811 | 0.10 |
| 88 | Untitled Settlement | 67.961 | 26.812 | 9.02 |
| 89 | Untitled Settlement | 67.967 | 26.826 | 2.05 |
| 90 | Untitled Settlement | 67.966 | 26.827 | 6.22 |
| 91 | Untitled Settlement | 67.951 | 26.829 | 30.84 |
| 92 | Untitled Settlement | 67.959 | 26.833 | 2.86 |
| 93 | Untitled Settlement | 67.969 | 26.833 | 12.75 |
| 94 | Untitled Settlement | 67.961 | 26.835 | 1.97 |
| 95 | Untitled Settlement | 67.954 | 26.836 | 5.83 |
| 96 | Untitled Settlement | 67.969 | 26.847 | 0.24 |
| 97 | Untitled Settlement | 67.969 | 26.847 | 0.86 |
| 98 | Untitled Settlement | 67.963 | 26.850 | 4.53 |
| 99 | Untitled Settlement | 67.971 | 26.855 | 1.38 |
| 100 | Untitled Settlement | 67.968 | 26.855 | 3.22 |
| 101 | Untitled Settlement | 67.973 | 26.856 | 9.14 |
| 102 | Untitled Settlement | 67.970 | 26.858 | 3.39 |
| 103 | Untitled Settlement | 67.967 | 26.858 | 11.69 |
| 104 | Untitled Settlement | 67.975 | 26.861 | 13.17 |
| 105 | Untitled Settlement | 67.995 | 26.870 | 14.95 |
| 106 | Untitled Settlement | 68.000 | 26.878 | 13.25 |
| 107 | Untitled Settlement | 68.004 | 26.886 | 6.46 |
| 108 | Untitled Settlement | 68.000 | 26.889 | 13.41 |

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|---------------------|-----------|----------|--------------|
| 109 | Untitled Settlement | 67.992 | 26.910 | 4.24 |
| 110 | Untitled Settlement | 67.994 | 26.918 | 2.22 |
| 111 | Untitled Settlement | 67.994 | 26.919 | 1.87 |
| 112 | Untitled Settlement | 67.998 | 26.920 | 2.70 |
| 113 | Untitled Settlement | 67.995 | 26.921 | 3.22 |
| 114 | Untitled Settlement | 67.993 | 26.922 | 1.59 |
| 115 | Untitled Settlement | 67.996 | 26.922 | 5.48 |
| 116 | Untitled Settlement | 67.997 | 26.924 | 1.75 |
| 117 | Untitled Settlement | 67.990 | 26.922 | 9.34 |
| 118 | Untitled Settlement | 67.996 | 26.924 | 1.24 |
| 119 | Untitled Settlement | 67.992 | 26.926 | 0.98 |
| 120 | Untitled Settlement | 67.991 | 26.926 | 3.18 |
| 121 | Untitled Settlement | 67.991 | 26.928 | 2.62 |
| 122 | Untitled Settlement | 67.996 | 26.927 | 19.36 |
| 123 | Untitled Settlement | 67.993 | 26.930 | 2.76 |
| 124 | Untitled Settlement | 67.995 | 26.930 | 4.70 |
| 125 | Untitled Settlement | 67.996 | 26.932 | 10.28 |
| 126 | Untitled Settlement | 68.058 | 26.996 | 2.39 |
| 127 | Untitled Settlement | 68.054 | 27.000 | 0.88 |
| 128 | Untitled Settlement | 68.054 | 26.999 | 3.65 |
| 129 | Untitled Settlement | 68.057 | 27.002 | 20.68 |
| 130 | Untitled Settlement | 68.065 | 27.016 | 6.90 |
| 131 | Untitled Settlement | 68.064 | 27.024 | 14.31 |
| 132 | Untitled Settlement | 68.115 | 27.024 | 6.14 |
| 133 | Untitled Settlement | 68.076 | 27.024 | 16.05 |
| 134 | Untitled Settlement | 68.119 | 27.025 | 8.58 |
| 135 | Untitled Settlement | 68.060 | 27.024 | 27.76 |
| 136 | Untitled Settlement | 68.120 | 27.028 | 4.66 |
| 137 | Untitled Settlement | 68.120 | 27.027 | 2.12 |
| 138 | Untitled Settlement | 68.091 | 27.027 | 8.94 |
| 139 | Untitled Settlement | 68.113 | 27.030 | 8.31 |
| 140 | Untitled Settlement | 68.112 | 27.036 | 3.42 |
| 141 | Untitled Settlement | 68.119 | 27.038 | 2.25 |
| 142 | Untitled Settlement | 68.116 | 27.044 | 3.92 |
| 143 | Untitled Settlement | 68.118 | 27.045 | 6.78 |
| 144 | Untitled Settlement | 68.121 | 27.047 | 3.34 |
| 145 | Untitled Settlement | 68.126 | 27.052 | 2.75 |

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|---------------------|-----------|----------|--------------|
| 146 | Untitled Settlement | 68.146 | 27.056 | 2.94 |
| 147 | Untitled Settlement | 68.144 | 27.056 | 2.24 |
| 148 | Untitled Settlement | 68.142 | 27.062 | 4.01 |
| 149 | Untitled Settlement | 68.140 | 27.065 | 2.82 |
| 150 | Untitled Settlement | 68.140 | 27.066 | 4.56 |
| 151 | Untitled Settlement | 68.147 | 27.082 | 5.44 |
| 152 | Untitled Settlement | 68.150 | 27.084 | 1.82 |
| 153 | Untitled Settlement | 68.156 | 27.091 | 3.97 |
| 154 | Untitled Settlement | 68.153 | 27.092 | 2.27 |
| 155 | Untitled Settlement | 68.153 | 27.097 | 3.09 |
| 156 | Untitled Settlement | 68.156 | 27.103 | 1.06 |
| 157 | Untitled Settlement | 68.148 | 27.109 | 1.83 |
| 158 | Untitled Settlement | 68.163 | 27.109 | 2.98 |
| 159 | Untitled Settlement | 68.154 | 27.110 | 3.60 |
| 160 | Untitled Settlement | 68.144 | 27.114 | 1.22 |
| 161 | Untitled Settlement | 68.133 | 27.119 | 6.25 |
| 162 | Untitled Settlement | 68.142 | 27.121 | 5.63 |
| 163 | Untitled Settlement | 68.160 | 27.121 | 4.88 |
| 164 | Untitled Settlement | 68.158 | 27.123 | 2.30 |
| 165 | Untitled Settlement | 68.159 | 27.123 | 0.29 |
| 166 | Untitled Settlement | 68.147 | 27.126 | 2.64 |
| 167 | Untitled Settlement | 68.144 | 27.125 | 6.26 |
| 168 | Untitled Settlement | 68.131 | 27.130 | 3.70 |
| 169 | Untitled Settlement | 68.169 | 27.130 | 11.43 |
| 170 | Untitled Settlement | 68.126 | 27.131 | 9.03 |
| 171 | Untitled Settlement | 68.163 | 27.132 | 3.67 |
| 172 | Untitled Settlement | 68.122 | 27.132 | 5.48 |
| 173 | Untitled Settlement | 68.135 | 27.133 | 2.20 |
| 174 | Untitled Settlement | 68.140 | 27.133 | 3.00 |
| 175 | Untitled Settlement | 68.160 | 27.135 | 5.70 |
| 176 | Untitled Settlement | 68.145 | 27.136 | 5.60 |
| 177 | Untitled Settlement | 68.121 | 27.138 | 2.06 |
| 178 | Untitled Settlement | 68.161 | 27.140 | 0.02 |
| 179 | Untitled Settlement | 68.161 | 27.139 | 8.06 |
| 180 | Untitled Settlement | 68.166 | 27.144 | 4.24 |
| 181 | Untitled Settlement | 68.131 | 27.145 | 3.50 |
| 182 | Untitled Settlement | 68.164 | 27.146 | 6.50 |

| S.No | Name | Longitude | Latitude | Area (acres) |
|------|---------------------|-----------|----------|--------------|
| 183 | Untitled Settlement | 68.160 | 27.147 | 1.71 |
| 184 | Untitled Settlement | 68.147 | 27.147 | 26.15 |
| 185 | Untitled Settlement | 68.163 | 27.148 | 5.24 |
| 186 | Untitled Settlement | 68.165 | 27.149 | 7.96 |
| 187 | Untitled Settlement | 68.188 | 27.160 | 16.47 |
| 188 | Untitled Settlement | 68.204 | 27.172 | 0.06 |
| 189 | Untitled Settlement | 68.203 | 27.176 | 8.76 |
| 190 | Untitled Settlement | 68.201 | 27.175 | 0.68 |
| 191 | Untitled Settlement | 67.944 | 26.613 | 7.58 |
| 192 | Untitled Settlement | 67.924 | 26.637 | 11.39 |
| 193 | Untitled Settlement | 67.922 | 26.634 | 0.00 |
| 194 | Untitled Settlement | 67.923 | 26.634 | 3.84 |
| 195 | Untitled Settlement | 67.916 | 26.632 | 2.56 |
| 196 | Untitled Settlement | 67.916 | 26.632 | 1.22 |
| 197 | Untitled Settlement | 67.980 | 26.860 | 9.73 |
| 198 | Untitled Settlement | 67.947 | 26.801 | 2.52 |
| 199 | Untitled Settlement | 68.115 | 27.023 | 0.11 |
| 200 | Untitled Settlement | 68.114 | 27.023 | 0.08 |
| 201 | Untitled Settlement | 68.114 | 27.023 | 0.14 |
| 202 | Untitled Settlement | 68.118 | 27.026 | 0.05 |
| 203 | Untitled Settlement | 68.118 | 27.026 | - |
| 204 | Untitled Settlement | 68.156 | 27.103 | 0.33 |
| 205 | Untitled Settlement | 68.157 | 27.103 | - |
| 206 | Untitled Settlement | 68.204 | 27.172 | 2.45 |
| 207 | Untitled Settlement | 68.204 | 27.172 | - |

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) |
|------------------|---------------------|-----------------------------|--------------|---------------------------|---------------------|
| 1 | Upper right corner: | 27°42'19.40"N 68°23'34.46"E | 82.6 | ~3,700 | 183 |
| | Upper left corner: | 27°42'7.03"N 68°23'14.94"E | | | |
| | Lower right corner: | 27°42'10.40"N 68°23'46.90"E | | | |
| | Lower left corner: | 27°41'53.57"N 68°23'21.54"E | | | |
| 2 | Upper right corner: | 27°38'47.54"N 68°19'29.86"E | 180 | ~8,000 | 180 |
| | Upper left corner: | 27°38'25.06"N 68°18'42.91"E | | | |
| | Lower right corner: | 27°38'28.72"N 68°19'32.25"E | | | |
| | Lower left corner: | 27°38'7.77"N 68°18'49.01"E | | | |
| 3 | Upper right corner: | 27°25'29.30"N 68°12'34.99"E | 370 | ~16,000 | 167 |
| | Upper left corner: | 27°25'24.02"N 68°12'15.63"E | | | |
| | Lower right corner: | 27°24'53.36"N 68°13'13.72"E | | | |
| | Lower left corner: | 27°24'35.39"N 68°12'23.33"E | | | |
| 4 | Upper right corner: | 27°17'39.47"N 68° 6'16.25"E | 158 | ~7,000 | 156 |
| | Upper left corner: | 27°17'35.37"N 68° 6'6.16"E | | | |
| | Lower right corner: | 27°17'0.75"N 68° 6'50.89"E | | | |
| | Lower left corner: | 27°16'55.59"N 68° 6'29.80"E | | | |
| 5 | Upper right corner: | 27°14'36.50"N 68° 3'57.05"E | 194 | ~8,700 | 153 |
| | Upper left corner: | 27°14'19.55"N 68° 3'16.09"E | | | |
| | Lower right corner: | 27°14'17.72"N 68° 4'2.69"E | | | |
| | Lower left corner: | 27°13'58.48"N 68° 3'20.96"E | | | |

A total of 5 shelter locations have been selected as Flood shelter places across district Naushahro Feroze. 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 43,400 tents (tent with size of 45 sq. m each) can be set up within the demarcated shelter places.

ANNEX – C – SHELTER LOCATIONS DESCRIPTION – EARTHQUAKE

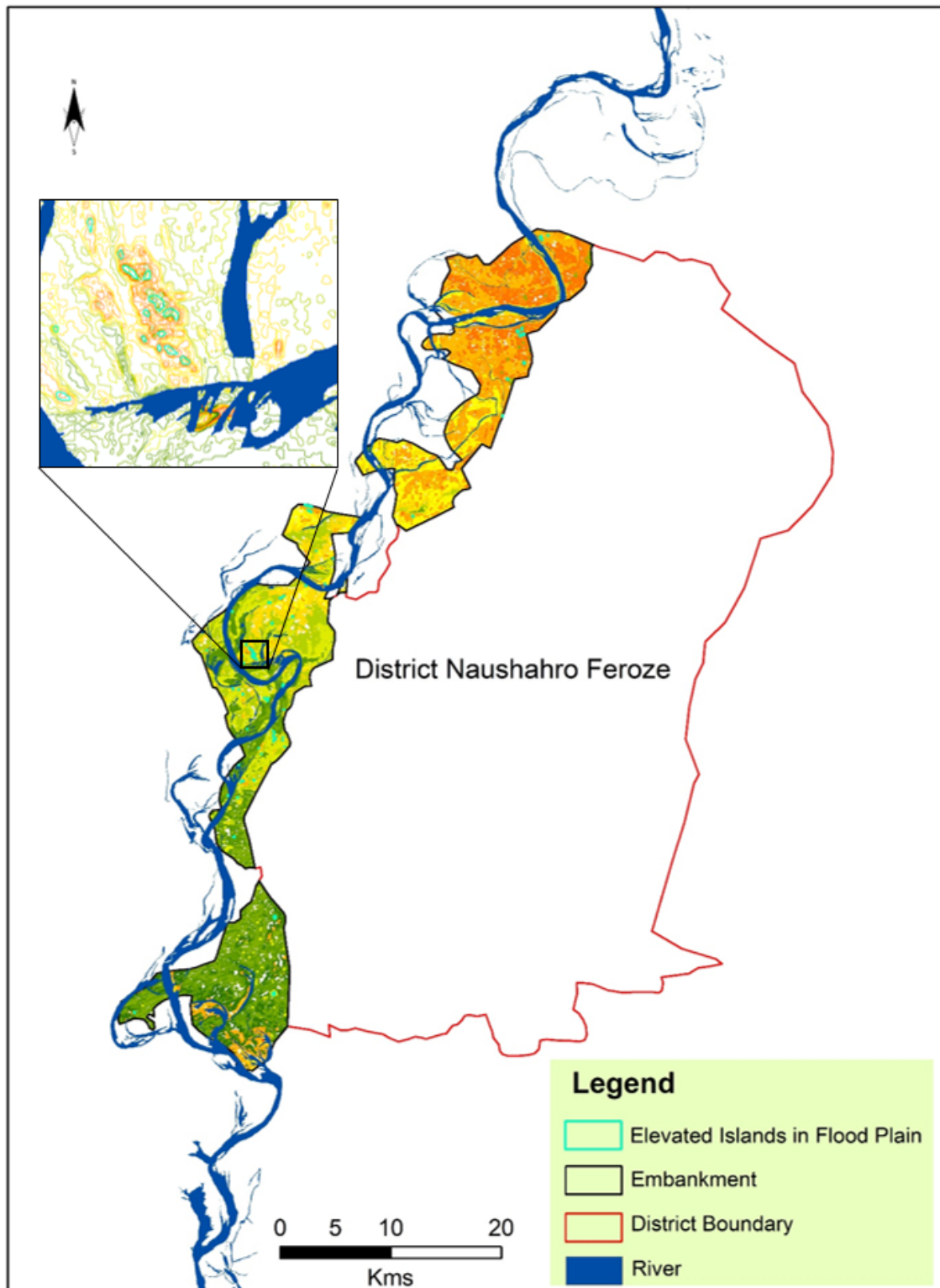
The given shelter locations for earthquake are proposed on the findings of the MHVRA 2022 study and information obtained through satellite technology and online verifiable sources. It is recommended to conduct on ground physical surveys to evaluate their suitability.

| S. No. | Co-ordinates | | Area (acres) | Estimated Tents (numbers) | Avg. elevation (ft) |
|--------|---------------------|-----------------------------|--------------|---------------------------|---------------------|
| 1 | Upper right corner: | 27°50'47.90"N 68°15'35.20"E | 199 | ~8,900 | 172 |
| | Upper left corner: | 27°50'47.28"N 68°14'59.76"E | | | |
| | Lower right corner: | 27°50'19.10"N 68°15'33.54"E | | | |
| | Lower left corner: | 27°50'22.48"N 68°14'58.34"E | | | |
| 2 | Upper right corner: | 27°46'59.53"N 68°17'18.39"E | 113 | ~5,000 | 174 |
| | Upper left corner: | 27°47'1.66"N 68°17'1.18"E | | | |
| | Lower right corner: | 27°46'34.50"N 68°17'8.53"E | | | |
| | Lower left corner: | 27°46'35.53"N 68°16'45.24"E | | | |
| 3 | Upper right corner: | 27°36'16.58"N 68°12'25.82"E | 129 | ~5,700 | 168 |
| | Upper left corner: | 27°36'22.54"N 68°11'57.27"E | | | |
| | Lower right corner: | 27°35'58.77"N 68°12'26.33"E | | | |
| | Lower left corner: | 27°35'59.51"N 68°12'0.00"E | | | |
| 4 | Upper right corner: | 27°34'15.52"N 68°11'1.21"E | 139 | ~6,200 | 170 |
| | Upper left corner: | 27°34'17.29"N 68°10'45.94"E | | | |
| | Lower right corner: | 27°33'30.42"N 68°10'29.77"E | | | |
| | Lower left corner: | 27°33'34.70"N 68°10'18.77"E | | | |
| 5 | Upper right corner: | 27°33'31.52"N 68° 7'59.87"E | 134 | ~6,000 | 169 |
| | Upper left corner: | 27°33'52.31"N 68° 7'31.93"E | | | |
| | Lower right corner: | 27°33'9.80"N 68° 7'57.33"E | | | |
| | Lower left corner: | 27°33'13.46"N 68° 7'48.80"E | | | |
| 6 | Upper right corner: | 27°19'11.66"N 68° 2'37.06"E | 385 | ~17,000 | 159 |
| | Upper left corner: | 27°19'10.29"N 68° 1'35.91"E | | | |
| | Lower right corner: | 27°18'43.94"N 68° 2'43.11"E | | | |
| | Lower left corner: | 27°18'41.79"N 68° 1'33.68"E | | | |

A total of 4 shelter locations have been selected as Earthquake shelter places across district Naushahro Feroze. 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 109,800 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 NAUSHAHRO FEROZE

Total 72 elevated islands have been identified within the embankments in district Naushahro Feroze, with a cumulative area of approximately 171.28 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 Naushahro Feroze 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 losses (life and material) due to breaching scenarios may be minimized or even reduced to zero.

ANNEX – F – LIST OF EQUIPMENT AVAILABLE IN DISTRICT NAUSHAHRO FEROZE

| Equipment | Quantity |
|--------------------------------|----------|
| De-watering Machine | 74 |
| Buildozers / Dozers | 5 |
| Fire Brigade / Engine / Tender | 10 |
| Tractor / Trolley / Blade | 28 |
| Water Tanker | 3 |
| Ambulances | 5 |
| Refuge Van | 5 |

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