MHVRA

INFORMED DISASTER MANAGEMENT PLAN

2023-2032

DISTRICT KHAIRPUR

HTTPS://WWW.CLIMATESIGNALS.ORG/EVENTS/PAKISTAN-FLOODS-2010

DEVELOPED BY
PDMA SINDH

THROUGH
SUPARCO

WITH THE SUPPORT OF

THE WORLD BANK
IBRD • IDA

CONTENTS

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 Khairpur 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 Khairpur 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 Khairpur 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.

DEVELOPED BY PDMA SINDH

THROUGH SUPARCO

WITH THE SUPPORT OF THE WORLD BANK IBRD • IDA

- - 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.

INTRODUCTION TO DISASTER MANAGEMENT PLAN OF DISTRICT KHAIRPUR

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

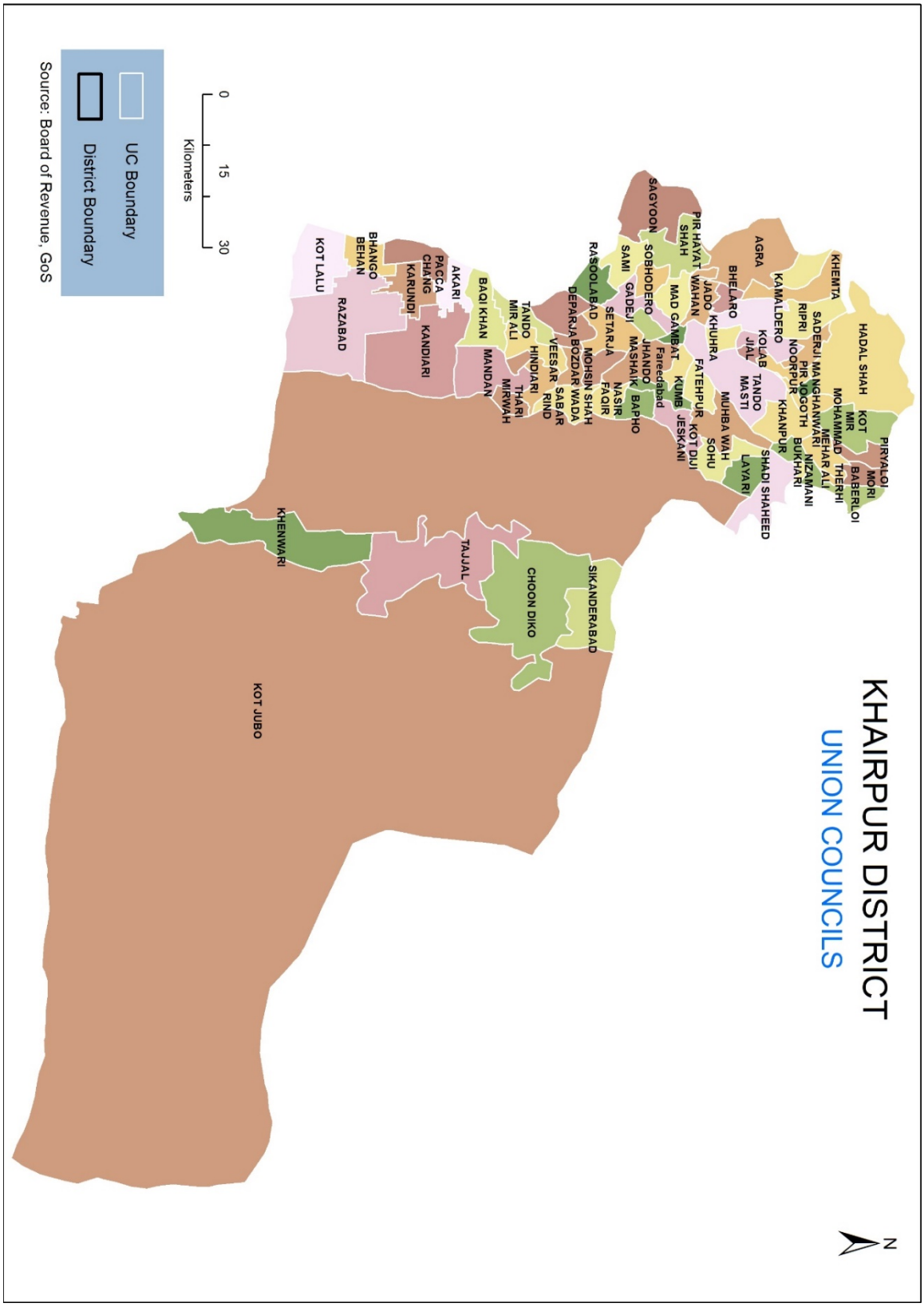
MODES OF REVIEW

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 KHAIRPUR

DISTRICT KHAIRPUR AT A GLANCE



GEOGRAPHY

District area in Sq. Km	16,076	
Coordinates	Longitude 68° 10' 20" to 70° 10' 58" East Latitude 26° 7' 57" to 27° 44' 9"North	
Surrounding Districts	Sukkur and Shikarpur in North Sanghar and Shaheed Benazirabad in South Larkana and Naushahro Feroze in West India in East	
Climate Conditions	Hot and Semi-Arid	
Coldest Month Hottest Month	January June	
Seasonal Temperatures	Max Mean (°C)	Min Mean (°C)
Spring (March and April)	37.88	20.91
Dry Summer (May and June)	44.66	28.84
Wet Summer (July to September)	41.39	28.41
Autumn (October to November)	35.20	19.50
Winter (December to February)	26.63	11.01
Average Rainfall	127.65 mm/year	
Physiographic Features	Khuth Lake, Bakri Waro Lake, Kot Diji Fort	

DEMOGRAPHY

	Year-1998	**Year-2017**
Population	1,547,751	2,405,190
Urban	365,216	777,006
Rural	1,182,535	1,628,184
No. of Household	-	413,044
Average Annual Growth Rate 1998-2017	2.34 %	

ECONOMY

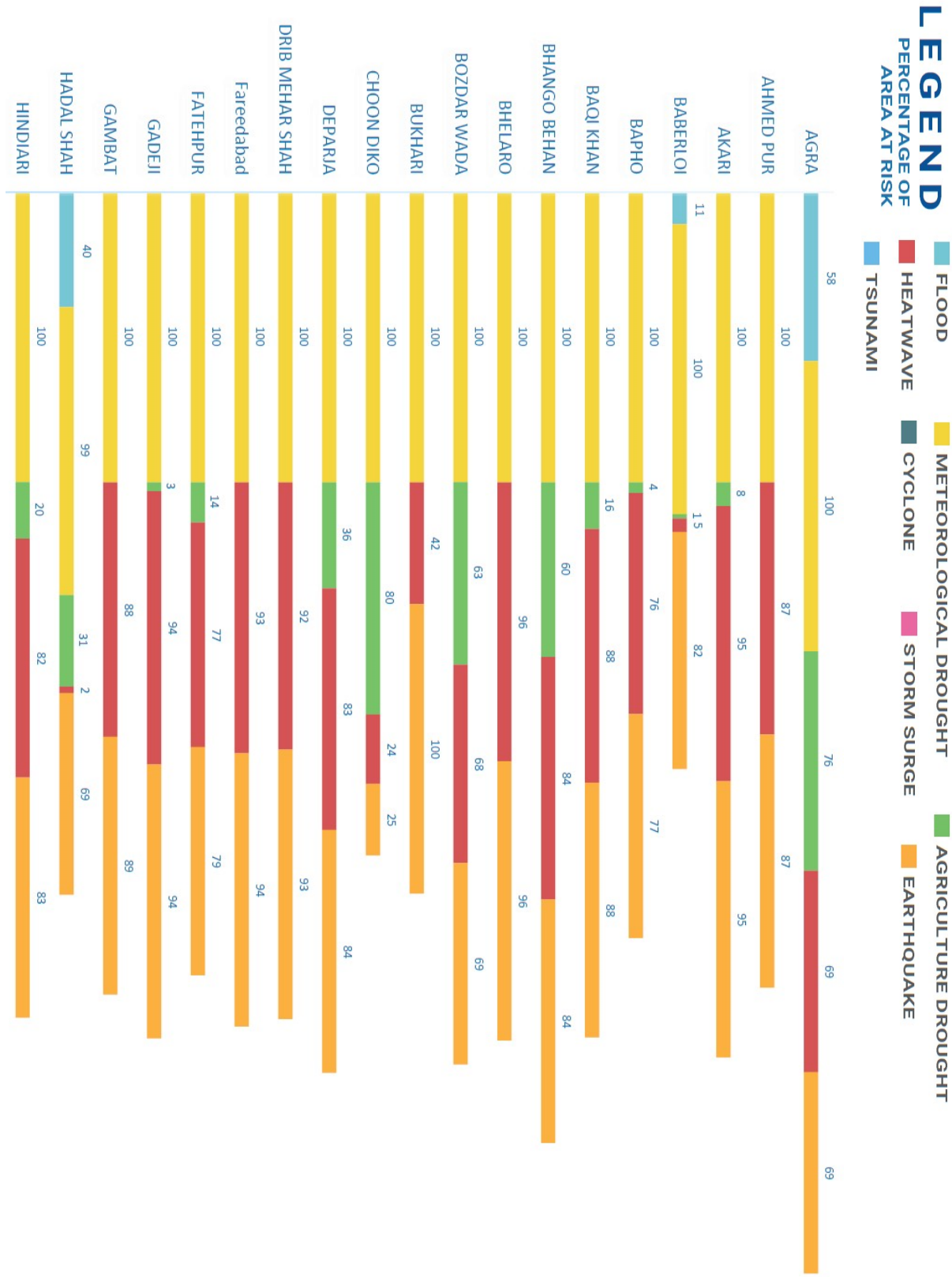
Industries	Food Products and Beverages and Textile
Agriculture	Production in M.tons as per (2016-17)
Major Crops	
Sugarcane	1,446,172
Cotton	73,617
Wheat	413,943
Minor Crops	
Barley	301
Bajra	162
Jowar	3,442
Rapeseed And Mustard	1,567

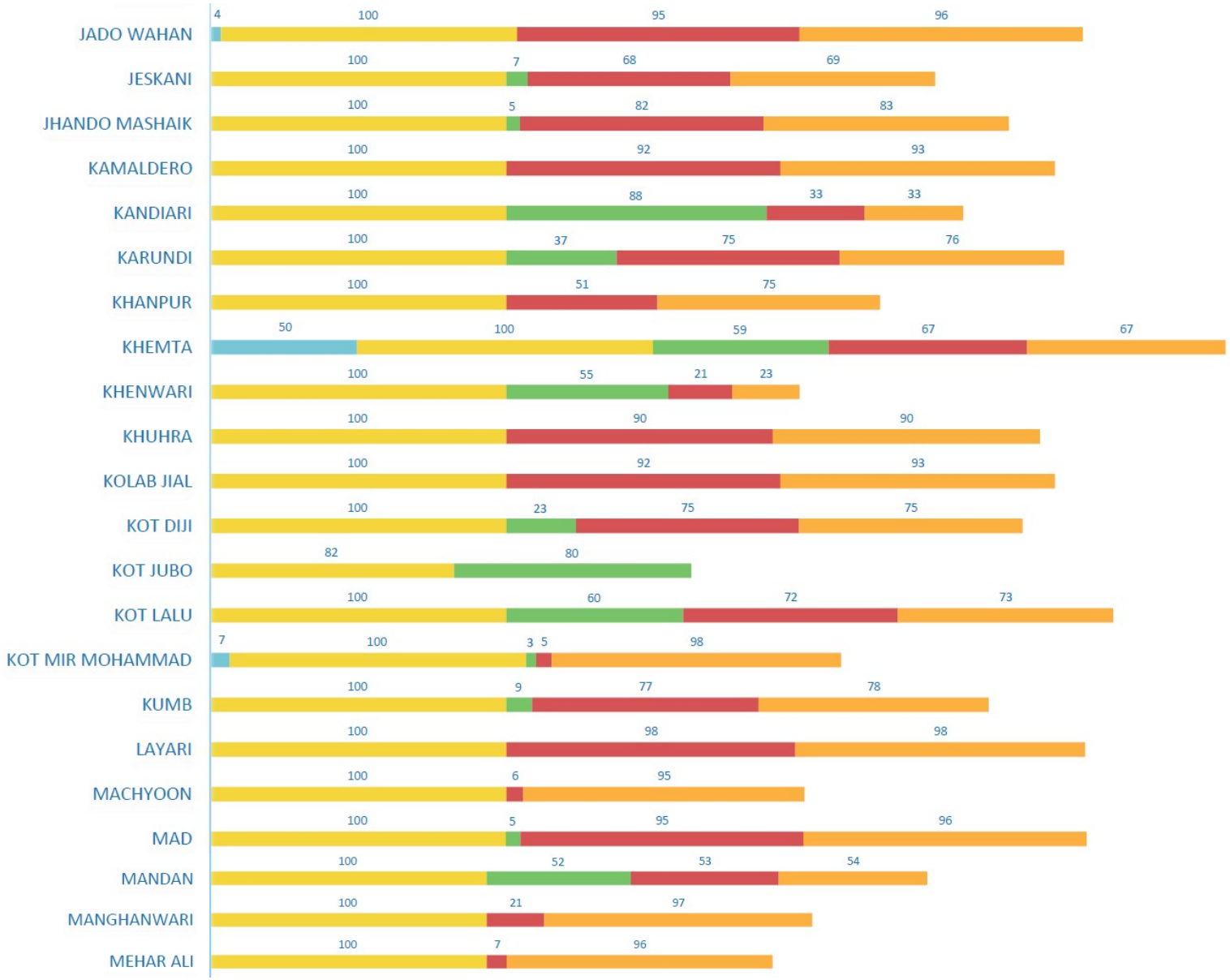
Maize	169
Sesame	45
Gram	451
Tobacco	140

ADMINISTRATIVE SYSTEM

TALUKA NAMES	UC NAMES
1. Faiz Ganj Taluka 2. Gambat Taluka 3. Khairpur Taluka 4. Kingri Taluka 5. Kot Diji Taluka 6. Mirwah Taluka 7. Nara Taluka 8. Sobho Dero Taluka	1. Agra 2. Ahmed Pur 3. Akari 4. Baberloi 5. Bapho 6. Baqi Khan 7. Bhango Behan 8. Bhelaro 9. Bozdar Wada 10. Bukhari 11. Choon Diko 12. Deparja 13. Drib Mehar Shah 14. Fareedabad 15. Fatehpur 16. Gadeji 17. Gambat 18. Hadal Shah 19. Hindiari 20. Jado Wahan 21. Jeskani 22. Jhando Mashaik 23. Kamaldero 24. Kandiari 25. Karundi 26. Khanpur 27. Khemta 28. Khenwari 29. Khuhra 30. Kolab Jial 31. Kot Diji 32. Kot Jubo 33. Kot Lalu 34. Kot Mir Mohammad 35. Kumb 36. Layari 37. Machyoon 38. Mad 39. Mandan 40. Manghanwari 41. Mehar Ali 42. Mohsin Shah 43. Mori 44. Muhba Wah 45. Nasir Faqir 46. Nizamani 47. Noorpur 48. Pacca Chang 49. Pir Hayat Shah 50. Pir Jogoth

	51. Piryaloi 52. Rani Pur Un 53. Rasoolabad 54. Razabad 55. Ripri 56. Sabar Rind 57. Saderji 58. Sagyoon 59. Sami 60. Setarja 61. Shadi Shaheed 62. Sikanderabad 63. Sobhodero 64. Sohu 65. Tajjal 66. Tando Masti 67. Tando Mir Ali 68. Thari Mirwah 69. Therhi 70. Veesar


LEGEND
PERCENTAGE OF AREA AT RISK
FLOOD
METEOROLOGICAL DROUGHT
AGRICULTURE DROUGHT
HEATWAVE
CYCLONE
STORM SURGE
EARTHQUAKE
TSUNAMI
AGRA 58 100 76 69 69
AHMED PUR 100 87 87
AKARI 100 8 95 95
BABERLOI 11 100 1 5 82
BAPHO 100 4 76 77
BAQI KHAN 100 16 88 88
BHANGO BEHAN 100 60 84 84
BHELARO 100 96 96
BOZDAR WADA 100 63 68 69
BUKHARI 100 42 100
CHOON DIKO 100 80 24 25
DEPARJA 100 36 83 84
DRIB MEHAR SHAH 100 92 93
Fareedabad 100 93 94
FATEHPUR 100 14 77 79
GADEJI 100 3 94 94
GAMBAT 100 88 89
HADAL SHAH 40 99 31 2 69
HINDIARI 100 20 82 83


JADO WAHAN 4 100 95 96
JESKANI 100 7 68 69
JHANDO MASHAIK 100 5 82 83
KAMALDERO 100 92 93
KANDIARI 100 88 33 33
KARUNDI 100 37 75 76
KHANPUR 100 51 75
KHEMTA 50 100 59 67 67
KHENWARI 100 55 21 23
KHUHRA 100 90 90
KOLAB JIAL 100 92 93
KOT DIJI 100 23 75 75
KOT JUBO 82 80
KOT LALU 100 60 72 73
KOT MIR MOHAMMAD 7 100 3 5 98
KUMB 100 9 77 78
LAYARI 100 98 98
MACHYOON 100 6 95
MAD 100 5 95 96
MANDAN 100 52 53 54
MANGHANWARI 100 21 97
MEHAR ALI 100 7 96


MOHSIN SHAH 100 11 86 87
MORI 29 100 3 4 71
MUHBA WAH 98 14 78 79
NASIR FAQIR 100 15 76 77
NIZAMANI 100 46 93
NOORPUR 100 70 95
PACCA CHANG 100 16 98 98
PIR HAYAT SHAH 37 100 52 70 70
PIR JOGOTH 100 6 98
PIRYALOI 24 99 4 74
RANI PUR UN 100 1 89 90
RASOOLABAD 100 4 94 94
RAZABAD 100 94 26 26
RIPRI 61 100 71 66 79
SABAR RIND 98 15 67 67
SADERJI 5 100 6 39 97
SAGYOON 65 100 83 82 82
SAMI 100 3 95 95
SETARJA 100 79 81
SHADI SHAHEED 85 18 66 67
SIKANDERABAD 100 73 35 36
SOBHODERO 100 98 98


SOHU
95
17
77
78
TAJJAL
100
67
33
34
TANDO MASTI
100
83
83
TANDO MIR ALI
100
60
87
87
THARI MIRWAH
100
66
43
43
THERHI
100
14
98
VEESAR
100
30
88
88

UC WISE RISK PROFILE

Agra			
Hazard Type	**Risk**	**Elements at Risk**	
Riverine Flood	Low-High	Agriculture Area	96.926 sq km
		Kachcha Area	1.456 sq km
		Natural vegetation in wet areas	3.765 sq km
		Pakka Planned Area	0.025 sq km
		Pakka Unplanned Area	0.21 sq km
		Range Land	0.004 sq km
		Education Facilities	24
		Settlements	22
		Irrigation and Drainage Network	0.936 km
		Road Network	45.101 km
		Population	17869
		Household	2906
Earthquake	Low	Agriculture Area	118.814 sq km
		Kachcha Area	1.642 sq km
		Natural vegetation in wet areas	0.216 sq km
		Pakka Planned Area	0.068 sq km
		Pakka Unplanned Area	1.392 sq km
		Range Land	0.004 sq km
		Education Facilities	60
		Health Facilities	1
		Mobile Towers	4
		Petrol Pumps	1
		Settlements	64
		Irrigation and Drainage Network	16.119 km
		Road Network	106.499 km
		Population	48615
		Household	8030
Heatwave	Low - High	Agriculture Area	118.728 sq km
		Kachcha Area	1.646 sq km
		Pakka Planned Area	0.068 sq km
		Pakka Unplanned Area	1.396 sq km
		Population	48726
		Household	8053
		Settlements	63
Meteorological Drought	Medium - Extreme	Settlements	64

		Agriculture Area	119.194 sq km
		Natural vegetation in wet areas	40.246 sq km
		Range Land	0.584 sq km
		Water Body	2.027 sq km
		Population	48977
		Household	8089
Agricultural Drought	Low - High	Agriculture Area	113.956 sq km
		Natural vegetation in wet areas	47.067 sq km
		Range Land	0.741 sq km
		Water Body	2.35 sq km
		Population	14496
		Household	2356
		Settlements	15
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Ahmed Pur			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	25.284 sq km
		Kachcha Area	0.174 sq km
		Pakka Unplanned Area	1.093 sq km
		Education Facilities	17
		Settlements	33
		Irrigation and Drainage Network	14.523 km
		Road Network	42.58 km
		Population	20482
		Household	3396
Heatwave	Low - High	Agriculture Area	25.247 sq km
		Kachcha Area	0.174 sq km
		Pakka Unplanned Area	1.095 sq km
		Population	20519
		Household	3401
		Settlements	33
Meteorological Drought	Medium - Extreme	Settlements	33
		Agriculture Area	25.403 sq km

		Water Body	1.37 sq km
		Wet area	2.551 sq km
		Population	20696
		Household	3432
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Storm Surge	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Cyclone	

Akari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	45.933 sq km
		Forest Area	0.001 sq km
		Kachcha Area	0.591 sq km
		Pakka Planned Area	0.211 sq km
		Pakka Unplanned Area	1.573 sq km
		Range Land	0.028 sq km
		Education Facilities	46
		Mobile Towers	1
		Settlements	103
		Irrigation and Drainage Network	36.796 km
		Road Network	88.665 km
		Population	22986
		Household	4501
Heatwave	Low - High	Agriculture Area	45.883 sq km
		Kachcha Area	0.591 sq km
		Pakka Planned Area	0.211 sq km
		Pakka Unplanned Area	1.577 sq km
		Population	23020
		Household	4507
		Settlements	100
Meteorological Drought	Medium - Extreme	Settlements	103
		Agriculture Area	46.013 sq km
		Bare Area with sparse Natural Vegetation	1.029 sq km
		Forest Area	0.016 sq km

		Range Land	0.344 sq km
		Water Body	0.221 sq km
		Wet area	0.229 sq km
		Population	23208
		Household	4537
Agricultural Drought	Low	Agriculture Area	4.487 sq km
		Bare Area with sparse Natural Vegetation	0.182 sq km
		Forest Area	0.02 sq km
		Range Land	0.425 sq km
		Population	160
		Household	29
		Settlements	1
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Baberloi			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	29.505 sq km
		Kachcha Area	0.104 sq km
		Natural vegetation in wet areas	0.03 sq km
		Pakka Planned Area	0.27 sq km
		Pakka Unplanned Area	1.198 sq km
		Bridges	1
		Education Facilities	33
		Health Facilities	2
		Mobile Towers	3
		Petrol Pumps	11
		Settlements	37
		Irrigation and Drainage Network	28.049 km
		Railway Line	0.114 km
		Road Network	53.468 km
		Population	27127
		Household	4812
Riverine Flood	Low - High	Agriculture Area	2.763 sq km

		Natural vegetation in wet areas	1.227 sq km
		Pakka Unplanned Area	0.259 sq km
		Education Facilities	5
		Settlements	7
		Irrigation and Drainage Network	0.014 km
		Road Network	0.535 km
		Population	2953
		Household	525
Heatwave	Low - Medium	Agriculture Area	0.507 sq km
		Kachcha Area	0.103 sq km
		Pakka Planned Area	0.266 sq km
		Pakka Unplanned Area	1.183 sq km
		Population	26834
		Household	4756
		Settlements	34
Meteorological Drought	Medium - Extreme	Settlements	37
		Agriculture Area	29.571 sq km
		Natural vegetation in wet areas	2.699 sq km
		Water Body	0.223 sq km
		Wet area	0.412 sq km
		Population	27275
		Household	4837
Agricultural Drought	Low	Agriculture Area	0.232 sq km
		Natural vegetation in wet areas	0.46 sq km
		Population	24
		Household	4
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Bapho			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	26.038 sq km
		Kachcha Area	1.141 sq km
		Natural vegetation in wet areas	0.186 sq km
		Pakka Planned Area	0.011 sq km

		Pakka Unplanned Area	1.274 sq km
		Range Land	0.078 sq km
		Education Facilities	43
		Health Facilities	1
		Settlements	43
		Irrigation and Drainage Network	15.338 km
		Road Network	76.573 km
		Population	27322
		Household	4671
Heatwave	Low - High	Agriculture Area	25.969 sq km
		Kachcha Area	1.141 sq km
		Pakka Planned Area	0.011 sq km
		Pakka Unplanned Area	1.274 sq km
		Population	27334
		Household	4668
		Settlements	43
Meteorological Drought	Medium - Extreme	Settlements	43
		Agriculture Area	26.18 sq km
		Bare Area with sparse Natural Vegetation	2.195 sq km
		Forest Area	0.011 sq km
		Natural vegetation in wet areas	1.575 sq km
		Range Land	0.283 sq km
		Water Body	1.936 sq km
		Wet area	2.938 sq km
		Population	27586
		Household	4712
Agricultural Drought	Low	Agriculture Area	0.502 sq km
		Bare Area with sparse Natural Vegetation	0.001 sq km
		Forest Area	0.013 sq km
		Natural vegetation in wet areas	0.081 sq km
		Range Land	0.251 sq km
		Water Body	0.856 sq km
		Wet area	0.012 sq km
		Population	573
		Household	97
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

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

Baqi Khan			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	76.096 sq km
		Forest Area	0.001 sq km
		Kachcha Area	1.705 sq km
		Pakka Planned Area	0.442 sq km
		Pakka Unplanned Area	1.724 sq km
		Range Land	0.074 sq km
		Education Facilities	84
		Mobile Towers	1
		Settlements	174
		Irrigation and Drainage Network	50.971 km
		Road Network	118.543 km
		Population	29346
		Household	5376
Heatwave	Low - High	Agriculture Area	76.012 sq km
		Kachcha Area	1.707 sq km
		Pakka Planned Area	0.442 sq km
		Pakka Unplanned Area	1.725 sq km
		Population	29365
		Household	5381
		Settlements	168
Meteorological Drought	Medium - Extreme	Settlements	174
		Agriculture Area	76.27 sq km
		Bare Area with sparse Natural Vegetation	7.876 sq km
		Forest Area	0.008 sq km
		Range Land	1.8 sq km
		Wet area	1.202 sq km
		Population	29675
		Household	5426
Agricultural Drought	Low - Medium	Agriculture Area	12.135 sq km
		Bare Area with sparse Natural Vegetation	3.493 sq km
		Forest Area	0.009 sq km
		Range Land	2.195 sq km

		Wet area	0.033 sq km
		Population	2630
		Household	488
		Settlements	21
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Bhango Behan			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	41.047 sq km
		Forest Area	0.006 sq km
		Kachcha Area	1.172 sq km
		Pakka Planned Area	0.013 sq km
		Pakka Unplanned Area	0.838 sq km
		Range Land	0.033 sq km
		Education Facilities	32
		Settlements	86
		Irrigation and Drainage Network	27.139 km
		Road Network	52.852 km
		Population	14746
		Household	2845
Heatwave	Low - High	Agriculture Area	40.972 sq km
		Kachcha Area	1.171 sq km
		Pakka Planned Area	0.013 sq km
		Pakka Unplanned Area	0.839 sq km
		Population	14743
		Household	2848
		Settlements	81
Meteorological Drought	Medium - Extreme	Settlements	86
		Agriculture Area	41.17 sq km
		Bare Area with sparse Natural Vegetation	7.755 sq km
		Forest Area	0.02 sq km
		Range Land	0.245 sq km
		Population	14871
		Household	2868

Agricultural Drought	Low - High	Agriculture Area	30.198 sq km
		Bare Area with sparse Natural Vegetation	7.495 sq km
		Forest Area	0.022 sq km
		Range Land	0.305 sq km
		Population	5707
		Household	1099
		Settlements	27
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Bhelaro			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	21.715 sq km
		Kachcha Area	0.129 sq km
		Natural vegetation in wet areas	0.004 sq km
		Pakka Unplanned Area	0.581 sq km
		Education Facilities	14
		Settlements	28
		Irrigation and Drainage Network	7.858 km
		Road Network	38.129 km
		Population	7513
		Household	1223
Heatwave	Low - High	Agriculture Area	21.697 sq km
		Kachcha Area	0.129 sq km
		Pakka Unplanned Area	0.582 sq km
		Population	7523
		Household	1224
		Settlements	28
Meteorological Drought	Medium - Extreme	Settlements	28
		Agriculture Area	21.757 sq km
		Natural vegetation in wet areas	0.202 sq km
		Water Body	0.225 sq km
		Wet area	0.242 sq km

		Population	7592
		Household	1233
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Bozdar Wada			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	18.918 sq km
		Forest Area	0.002 sq km
		Kachcha Area	0.63 sq km
		Natural vegetation in wet areas	0.009 sq km
		Pakka Unplanned Area	1.105 sq km
		Range Land	0.335 sq km
		Education Facilities	65
		Settlements	48
		Irrigation and Drainage Network	4.783 km
		Road Network	41.973 km
		Population	13942
		Household	2350
Heatwave	Low - High	Agriculture Area	18.851 sq km
		Kachcha Area	0.631 sq km
		Pakka Unplanned Area	1.104 sq km
		Population	13947
		Household	2351
		Settlements	43
Meteorological Drought	Medium - Extreme	Settlements	48
		Agriculture Area	19.027 sq km
		Bare Area with sparse Natural Vegetation	0.916 sq km
		Forest Area	0.055 sq km
		Natural vegetation in wet areas	0.554 sq km
		Range Land	3.756 sq km
		Water Body	1.165 sq km

		Wet area	2.939 sq km
		Population	14052
		Household	2366
Agricultural Drought	Low - High	Agriculture Area	13.226 sq km
		Bare Area with sparse Natural Vegetation	0.487 sq km
		Forest Area	0.069 sq km
		Natural vegetation in wet areas	0.692 sq km
		Range Land	4.715 sq km
		Water Body	1.464 sq km
		Wet area	1.978 sq km
		Population	9783
		Household	1648
		Settlements	30
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Bukhari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	5.11 sq km
		Kachcha Area	0.03 sq km
		Pakka Planned Area	0.777 sq km
		Pakka Unplanned Area	1.208 sq km
		Bridges	4
		Bus Stops	1
		Education Facilities	34
		Grain Mandi	2
		Health Facilities	7
		Mobile Towers	8
		Petrol Pumps	3
		Police Stations	7
		Post Offices	6
		Settlements	8
		Tourist Places	2
		Irrigation and Drainage Network	3.561 km
		Railway Line	1.22 km

		Road Network	17.702 km
		Population	39536
		Household	6912
Heatwave	Low - High	Agriculture Area	0.533 sq km
		Kachcha Area	0.029 sq km
		Pakka Planned Area	0.775 sq km
		Pakka Unplanned Area	1.207 sq km
		Population	39409
		Household	6889
		Settlements	8
Meteorological Drought	Medium	Settlements	8
		Agriculture Area	5.114 sq km
		Population	39551
		Household	6914
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Choon Diko			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	86.98 sq km
		Forest Area	0.008 sq km
		Kachcha Area	1.069 sq km
		Natural vegetation in wet areas	0.955 sq km
		Pakka Planned Area	0.885 sq km
		Pakka Unplanned Area	1.083 sq km
		Range Land	0.024 sq km
		Bridges	3
		Education Facilities	112
		Health Facilities	6
		Industries	1
		Mobile Towers	4
		Petrol Pumps	8
		Power Plant	1

		Settlements	64
		Irrigation and Drainage Network	74.345 km
		Road Network	162.288 km
		Population	43285
		Household	7717
Heatwave	Low - High	Agriculture Area	86.339 sq km
		Kachcha Area	1.07 sq km
		Pakka Planned Area	0.888 sq km
		Pakka Unplanned Area	1.082 sq km
		Population	43336
		Household	7727
		Settlements	49
Meteorological Drought	Medium - Extreme	Settlements	64
		Agriculture Area	88.569 sq km
		Bare Area with sparse Natural Vegetation	268.868 sq km
		Forest Area	0.391 sq km
		Natural vegetation in wet areas	13.018 sq km
		Range Land	0.587 sq km
		Water Body	5.766 sq km
		Wet area	1.089 sq km
		Population	43667
		Household	7787
Agricultural Drought	Low - Extreme	Agriculture Area	56.959 sq km
		Bare Area with sparse Natural Vegetation	304.885 sq km
		Natural vegetation in wet areas	12.116 sq km
		Range Land	0.307 sq km
		Water Body	6.793 sq km
		Wet area	0.018 sq km
		Population	47163
		Household	8420
		Settlements	40
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Deparja			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	48.673 sq km
		Natural vegetation in wet areas	0.061 sq km
		Pakka Planned Area	0.913 sq km
		Pakka Unplanned Area	1.315 sq km
		Range Land	0.022 sq km
		Bridges	3
		Education Facilities	30
		Health Facilities	1
		Mobile Towers	1
		Settlements	42
		Irrigation and Drainage Network	26.967 km
		Railway Line	7.323 km
		Road Network	99.297 km
		Population	17913
		Household	3011
Heatwave	Low - High	Agriculture Area	48.618 sq km
		Pakka Planned Area	0.913 sq km
		Pakka Unplanned Area	1.317 sq km
		Population	17923
		Household	3016
		Settlements	42
Meteorological Drought	Medium - Extreme	Settlements	42
		Agriculture Area	48.797 sq km
		Bare Area with sparse Natural Vegetation	5.272 sq km
		Natural vegetation in wet areas	0.855 sq km
		Range Land	0.272 sq km
		Water Body	1.675 sq km
		Wet area	1.174 sq km
		Population	18049
		Household	3033
Agricultural Drought	Low - High	Agriculture Area	20.03 sq km
		Bare Area with sparse Natural Vegetation	6.396 sq km
		Natural vegetation in wet areas	0.011 sq km
		Range Land	0.268 sq km
		Water Body	0.427 sq km

		Wet area	0.304 sq km
		Population	3924
		Household	659
		Settlements	10
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Drib Meher Shah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	11.315 sq km
		Kachcha Area	0.001 sq km
		Pakka Unplanned Area	0.241 sq km
		Education Facilities	5
		Settlements	12
		Irrigation and Drainage Network	8.778 km
		Road Network	32.05 km
		Population	3904
		Household	647
Heatwave	Low - High	Agriculture Area	11.3 sq km
		Kachcha Area	0.001 sq km
		Pakka Unplanned Area	0.241 sq km
		Population	3910
		Household	648
		Settlements	11
Meteorological Drought	Medium - Extreme	Settlements	12
		Agriculture Area	11.35 sq km
		Water Body	0.293 sq km
		Wet area	0.5 sq km
		Population	3953
		Household	655
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Fareedabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	23.294 sq km
		Kachcha Area	0.077 sq km
		Pakka Planned Area	0.265 sq km
		Pakka Unplanned Area	0.821 sq km
		Education Facilities	30
		Mobile Towers	2
		Petrol Pumps	4
		Settlements	37
		Irrigation and Drainage Network	16.479 km
		Railway Line	3.646 km
		Road Network	57.111 km
		Population	21323
		Household	3611
Heatwave	Low - High	Agriculture Area	23.268 sq km
		Kachcha Area	0.077 sq km
		Pakka Planned Area	0.265 sq km
		Pakka Unplanned Area	0.821 sq km
		Population	21321
		Household	3612
		Settlements	36
Meteorological Drought	Medium - Extreme	Settlements	37
		Agriculture Area	23.344 sq km
		Water Body	0.432 sq km
		Wet area	0.656 sq km
		Population	21471
		Household	3636
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Fateh Pur			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	30.211 sq km
		Kachcha Area	0.97 sq km
		Natural vegetation in wet areas	0.02 sq km
		Pakka Unplanned Area	0.79 sq km
		Range Land	0.046 sq km
		Education Facilities	25
		Settlements	33
		Irrigation and Drainage Network	23.13 km
		Railway Line	0.003 km
		Road Network	82.155 km
		Population	19825
		Household	3388
Heatwave	Low - High	Agriculture Area	30.159 sq km
		Kachcha Area	0.969 sq km
		Pakka Unplanned Area	0.791 sq km
		Population	19825
		Household	3394
		Settlements	31
Meteorological Drought	Medium - Extreme	Settlements	33
		Agriculture Area	30.329 sq km
		Natural vegetation in wet areas	0.424 sq km
		Range Land	0.706 sq km
		Water Body	3.195 sq km
		Wet area	3.856 sq km
		Population	19977
		Household	3415
Agricultural Drought	Low	Agriculture Area	6.276 sq km
		Natural vegetation in wet areas	0.531 sq km
		Range Land	0.217 sq km
		Water Body	0.152 sq km
		Wet area	0.014 sq km
		Population	839
		Household	143

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

Gadeji			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	49.198 sq km
		Forest Area	0.01 sq km
		Kachcha Area	0.119 sq km
		Pakka Planned Area	0.239 sq km
		Pakka Unplanned Area	2.359 sq km
		Range Land	0.08 sq km
		Bridges	2
		Bus Stops	1
		Education Facilities	44
		Mobile Towers	2
		Petrol Pumps	3
		Settlements	70
		Irrigation and Drainage Network	24.926 km
		Road Network	86.706 km
		Population	34309
		Household	5690
Heatwave	Low - High	Agriculture Area	49.154 sq km
		Kachcha Area	0.119 sq km
		Pakka Planned Area	0.239 sq km
		Pakka Unplanned Area	2.362 sq km
		Population	34352
		Household	5695
		Settlements	69
Meteorological Drought	Medium - Extreme	Settlements	70
		Agriculture Area	49.31 sq km
		Forest Area	0.236 sq km
		Natural vegetation in wet areas	0.01 sq km
		Range Land	0.543 sq km
		Water Body	0.186 sq km

		Wet area	1.581 sq km
		Population	34590
		Household	5735
Agricultural Drought	Low	Agriculture Area	1.365 sq km
		Range Land	0.491 sq km
		Water Body	0.224 sq km
		Wet area	0.004 sq km
		Population	658
		Household	109
		Settlements	1
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Gambat			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	9.608 sq km
		Kachcha Area	0.087 sq km
		Natural vegetation in wet areas	0.051 sq km
		Pakka Planned Area	1.299 sq km
		Pakka Unplanned Area	0.389 sq km
		Range Land	0.012 sq km
		Bridges	2
		Education Facilities	22
		Petrol Pumps	4
		Settlements	18
		Irrigation and Drainage Network	10.674 km
		Road Network	37.891 km
		Population	19406
		Household	3162
Heatwave	Low - High	Agriculture Area	9.594 sq km
		Kachcha Area	0.088 sq km
		Pakka Planned Area	1.299 sq km
		Pakka Unplanned Area	0.389 sq km
		Population	19414
		Household	3164

		Settlements	18
Meteorological Drought	Medium - Extreme	Settlements	18
		Agriculture Area	9.646 sq km
		Natural vegetation in wet areas	0.318 sq km
		Range Land	0.133 sq km
		Water Body	0.466 sq km
		Wet area	0.04 sq km
		Population	19555
		Household	3188
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Hadal Shah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	216.523 sq km
		Kachcha Area	2.226 sq km
		Natural vegetation in wet areas	0.299 sq km
		Pakka Planned Area	0.337 sq km
		Pakka Unplanned Area	3.681 sq km
		Bus Stops	2
		Education Facilities	123
		Grid Stations	1
		Health Facilities	3
		Mobile Towers	8
		Petrol Pumps	6
		Settlements	124
		Irrigation and Drainage Network	54.212 km
		Road Network	209 km
		Population	120105
		Household	20105
Riverine Flood	Low - High	Agriculture Area	118.777 sq km
		Kachcha Area	1.412 sq km
		Natural vegetation in wet areas	6.743 sq km

		Education Facilities	16
		Settlements	21
		Irrigation and Drainage Network	0.741 km
		Road Network	29.366 km
		Population	23121
		Household	3837
Heatwave	Low - Medium	Agriculture Area	0.961 sq km
		Kachcha Area	2.207 sq km
		Pakka Planned Area	0.337 sq km
		Pakka Unplanned Area	3.656 sq km
		Population	119280
		Household	19968
		Settlements	106
Meteorological Drought	Medium - Extreme	Settlements	124
		Agriculture Area	217.119 sq km
		Natural vegetation in wet areas	66.712 sq km
		Water Body	2.438 sq km
		Wet area	0.421 sq km
		Population	121044
		Household	20260
Agricultural Drought	Low - Medium	Agriculture Area	80.151 sq km
		Natural vegetation in wet areas	45.234 sq km
		Water Body	0.25 sq km
		Wet area	0.001 sq km
		Population	377
		Household	61
		Settlements	3
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Hindiari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	29.859 sq km
		Forest Area	0.156 sq km
		Kachcha Area	2.408 sq km

		Pakka Planned Area	1.117 sq km
		Pakka Unplanned Area	1.096 sq km
		Range Land	0.116 sq km
		Education Facilities	88
		Health Facilities	8
		Police Stations	2
		Post Offices	1
		Settlements	105
		Irrigation and Drainage Network	16.255 km
		Road Network	53.713 km
		Population	53560
		Household	9164
Heatwave	Low - High	Agriculture Area	29.795 sq km
		Kachcha Area	2.407 sq km
		Pakka Planned Area	1.118 sq km
		Pakka Unplanned Area	1.097 sq km
		Population	53576
		Household	9168
		Settlements	100
Meteorological Drought	Medium - Extreme	Settlements	105
		Agriculture Area	29.978 sq km
		Bare Area with sparse Natural Vegetation	4.492 sq km
		Forest Area	0.373 sq km
		Range Land	1.271 sq km
		Water Body	0.146 sq km
		Wet area	0.182 sq km
		Population	53974
		Household	9231
Agricultural Drought	Low - Medium	Agriculture Area	5.227 sq km
		Bare Area with sparse Natural Vegetation	1.891 sq km
		Forest Area	0.451 sq km
		Range Land	1.535 sq km
		Water Body	0.18 sq km
		Wet area	0.001 sq km
		Population	12175
		Household	2123
		Settlements	16
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

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

Jado Wahan			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	45.993 sq km
		Kachcha Area	0.12 sq km
		Pakka Planned Area	0.132 sq km
		Pakka Unplanned Area	1.73 sq km
		Range Land	0.004 sq km
		Bridges	1
		Education Facilities	36
		Mobile Towers	1
		Settlements	76
		Irrigation and Drainage Network	23.985 km
		Road Network	115.941 km
		Population	21587
		Household	3533
Riverine Flood	Low - Medium	Agriculture Area	1.798 sq km
		Education Facilities	1
		Irrigation and Drainage Network	1.667 km
		Road Network	3.363 km
Heatwave	Low - High	Agriculture Area	45.953 sq km
		Kachcha Area	0.119 sq km
		Pakka Planned Area	0.131 sq km
		Pakka Unplanned Area	1.73 sq km
		Population	21588
		Household	3538
		Settlements	76
Meteorological Drought	Medium - Extreme	Settlements	76
		Agriculture Area	46.083 sq km
		Range Land	0.06 sq km
		Water Body	0.916 sq km
		Wet area	0.863 sq km
		Population	21784
		Household	3562

Agricultural Drought	Low	Agriculture Area	0.529 sq km
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jeskani			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	25.859 sq km
		Forest Area	0.02 sq km
		Kachcha Area	1.905 sq km
		Natural vegetation in wet areas	0.001 sq km
		Pakka Planned Area	0.085 sq km
		Pakka Unplanned Area	1.711 sq km
		Range Land	0.007 sq km
		Bridges	1
		Education Facilities	42
		Mobile Towers	4
		Petrol Pumps	2
		Police Stations	1
		Settlements	47
		Tourist Places	2
		Irrigation and Drainage Network	15.512 km
		Road Network	94.411 km
		Population	59446
		Household	9907
Heatwave	Low - High	Agriculture Area	25.807 sq km
		Kachcha Area	1.902 sq km
		Pakka Planned Area	0.085 sq km
		Pakka Unplanned Area	1.712 sq km
		Population	59441
		Household	9905
		Settlements	45
Meteorological Drought	Medium - Extreme	Settlements	47
		Agriculture Area	25.969 sq km
		Bare Area with sparse Natural Vegetation	9.43 sq km
		Forest Area	0.135 sq km
		Natural vegetation in wet areas	0.039 sq km

		Range Land	0.096 sq km
		Water Body	2.714 sq km
		Wet area	0.649 sq km
		Population	59920
		Household	9982
Agricultural Drought	Low – Medium	Agriculture Area	0.074 sq km
		Bare Area with sparse Natural Vegetation	3.761 sq km
		Natural vegetation in wet areas	0.028 sq km
		Range Land	0.06 sq km
		Population	719
		Household	120
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Jhando Mashaik			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	65.662 sq km
		Kachcha Area	0.722 sq km
		Natural vegetation in wet areas	0.001 sq km
		Pakka Planned Area	0.563 sq km
		Pakka Unplanned Area	2.136 sq km
		Range Land	0.097 sq km
		Bridges	7
		Education Facilities	89
		Health Facilities	1
		Industries	1
		Mobile Towers	1
		Petrol Pumps	9
		Police Stations	1
		Settlements	106
		Irrigation and Drainage Network	39.743 km
		Railway Line	4.968 km
		Road Network	160.052 km
		Population	39305
		Household	6683

Heatwave	Low - High	Agriculture Area	65.581 sq km
		Kachcha Area	0.721 sq km
		Pakka Planned Area	0.562 sq km
		Pakka Unplanned Area	2.137 sq km
		Population	39296
		Household	6678
		Settlements	102
Meteorological Drought	Medium - Extreme	Settlements	106
		Agriculture Area	65.884 sq km
		Natural vegetation in wet areas	0.059 sq km
		Range Land	2.727 sq km
		Water Body	2.05 sq km
		Wet area	9.224 sq km
		Population	39591
		Household	6728
Agricultural Drought	Low - Medium	Agriculture Area	0.803 sq km
		Range Land	3.014 sq km
		Water Body	0.198 sq km
		Wet area	0.742 sq km
		Population	53
		Household	9
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kamaldero			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	67.15 sq km
		Kachcha Area	0.364 sq km
		Natural vegetation in wet areas	0.022 sq km
		Pakka Unplanned Area	1.937 sq km
		Range Land	0.009 sq km
		Education Facilities	56
		Settlements	65
		Irrigation and Drainage	48.321 km

		Network	
		Road Network	133.884 km
		Population	24428
		Household	3976
Riverine Flood	Low - Extreme	Agriculture Area	0.22 sq km
		Road Network	0.161 km
Heatwave	Low - High	Agriculture Area	67.074 sq km
		Kachcha Area	0.365 sq km
		Pakka Unplanned Area	1.94 sq km
		Population	24477
		Household	3980
		Settlements	63
Meteorological Drought	Medium - Extreme	Settlements	65
		Agriculture Area	67.367 sq km
		Natural vegetation in wet areas	0.594 sq km
		Range Land	0.134 sq km
		Water Body	3.962 sq km
		Wet area	0.492 sq km
		Population	24671
		Household	4013
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Low-High	The UC falls out of vulnerable zone for Agricultural Drought	

Kandiari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	81.956 sq km
		Kachcha Area	4.759 sq km
		Pakka Unplanned Area	1.3 sq km
		Range Land	0.007 sq km
		Education Facilities	68
		Settlements	181
		Irrigation and Drainage Network	36.222 km
		Road Network	62.523 km
		Population	44139

		Household	8526
Heatwave	Low - High	Agriculture Area	81.689 sq km
		Kachcha Area	4.761 sq km
		Pakka Unplanned Area	1.302 sq km
		Population	44157
		Household	8525
		Settlements	162
Meteorological Drought	Medium - Extreme	Settlements	181
		Agriculture Area	82.57 sq km
		Bare Area with sparse Natural Vegetation	167.866 sq km
		Natural vegetation in wet areas	1.283 sq km
		Range Land	1.62 sq km
		Water Body	4.21 sq km
		Wet area	1.186 sq km
		Population	44813
		Household	8651
Agricultural Drought	Low - Extreme	Agriculture Area	76.178 sq km
		Bare Area with sparse Natural Vegetation	201.027 sq km
		Natural vegetation in wet areas	1.611 sq km
		Range Land	2.03 sq km
		Water Body	5.289 sq km
		Wet area	1.49 sq km
		Population	37086
		Household	7155
		Settlements	123
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Karundi			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	49.382 sq km
		Kachcha Area	2.011 sq km
		Pakka Planned Area	0.189 sq km

		Pakka Unplanned Area	1.642 sq km
		Range Land	0.008 sq km
		Bridges	1
		Education Facilities	79
		Mobile Towers	3
		Settlements	145
		Irrigation and Drainage Network	23.34 km
		Road Network	86.108 km
		Population	35699
		Household	6952
Heatwave	Low - High	Agriculture Area	49.254 sq km
		Kachcha Area	2.011 sq km
		Pakka Planned Area	0.189 sq km
		Pakka Unplanned Area	1.642 sq km
		Population	35692
		Household	6950
		Settlements	139
Meteorological Drought	Medium - Extreme	Settlements	145
		Agriculture Area	49.615 sq km
		Bare Area with sparse Natural Vegetation	15.548 sq km
		Range Land	0.128 sq km
		Water Body	0.358 sq km
		Population	36038
		Household	7007
Agricultural Drought	Low - High	Agriculture Area	19.013 sq km
		Bare Area with sparse Natural Vegetation	12.195 sq km
		Range Land	0.122 sq km
		Population	12158
		Household	2349
		Settlements	29
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khanpur			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	51.246 sq km
		Forest Area	0.003 sq km
		Kachcha Area	0.57 sq km
		Pakka Planned Area	0.607 sq km
		Pakka Unplanned Area	1.264 sq km
		Bridges	3
		Education Facilities	30
		Mobile Towers	1
		Petrol Pumps	7
		Settlements	65
		Irrigation and Drainage Network	44.828 km
		Railway Line	5.568 km
		Road Network	89.879 km
		Population	29132
		Household	5155
Heatwave	Low - Extreme	Agriculture Area	34.748 sq km
		Kachcha Area	0.569 sq km
		Pakka Planned Area	0.608 sq km
		Pakka Unplanned Area	1.264 sq km
		Population	29123
		Household	5153
		Settlements	54
Meteorological Drought	Medium - Extreme	Settlements	65
		Agriculture Area	51.561 sq km
		Bare Area with sparse Natural Vegetation	0.012 sq km
		Forest Area	0.033 sq km
		Water Body	2.932 sq km
		Wet area	14.893 sq km
		Population	29374
		Household	5195
Agricultural Drought	Low-High	Agriculture Area	0.104 sq km
		Wet area	0.003 sq km
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone

Khemta			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	49.901 sq km
		Forest Area	0.016 sq km
		Kachcha Area	0.512 sq km
		Natural vegetation in wet areas	0.067 sq km
		Pakka Planned Area	0.075 sq km
		Pakka Unplanned Area	0.995 sq km
		Education Facilities	24
		Settlements	27
		Irrigation and Drainage Network	14.258 km
		Road Network	63.562 km
		Population	16708
		Household	2720
Riverine Flood	Low - High	Agriculture Area	36.438 sq km
		Forest Area	0.016 sq km
		Kachcha Area	0.501 sq km
		Natural vegetation in wet areas	1.144 sq km
		Pakka Unplanned Area	0.008 sq km
		Education Facilities	6
		Settlements	6
		Road Network	25.389 km
		Population	5387
		Household	873
Heatwave	Low - High	Agriculture Area	49.872 sq km
		Kachcha Area	0.512 sq km
		Pakka Planned Area	0.075 sq km
		Pakka Unplanned Area	0.996 sq km
		Population	16722
		Household	2721
		Settlements	27
Meteorological Drought	Medium - Extreme	Settlements	27
		Agriculture Area	50.001 sq km
		Forest Area	0.09 sq km
		Natural vegetation in wet areas	19.738 sq km
		Water Body	0.449 sq km
		Population	16839

		Household	2739
Agricultural Drought	Low - High	Agriculture Area	40.19 sq km
		Forest Area	0.113 sq km
		Natural vegetation in wet areas	15.007 sq km
		Water Body	0.423 sq km
		Population	5160
		Household	840
		Settlements	4
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khenwari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	50.263 sq km
		Forest Area	0.006 sq km
		Kachcha Area	0.568 sq km
		Natural vegetation in wet areas	2.31 sq km
		Pakka Planned Area	0.134 sq km
		Range Land	1.021 sq km
		Bridges	1
		Education Facilities	38
		Mobile Towers	2
		Petrol Pumps	2
		Settlements	21
		Irrigation and Drainage Network	58.706 km
		Road Network	122.971 km
		Population	7478
		Household	1323
Heatwave	Low - Medium	Agriculture Area	50.013 sq km
		Kachcha Area	0.569 sq km
		Pakka Planned Area	0.134 sq km
		Population	7489
		Household	1326
		Settlements	12
Meteorological Drought	Medium - Extreme	Settlements	21

		Agriculture Area	51.11 sq km
		Bare Area with sparse Natural Vegetation	36.252 sq km
		Forest Area	0.105 sq km
		Natural vegetation in wet areas	102.044 sq km
		Range Land	48.891 sq km
		Water Body	1.688 sq km
		Wet area	0.438 sq km
		Population	7564
		Household	1339
Agricultural Drought	Low - Extreme	Agriculture Area	21.67 sq km
		Bare Area with sparse Natural Vegetation	35.701 sq km
		Forest Area	0.126 sq km
		Natural vegetation in wet areas	58.751 sq km
		Range Land	46.713 sq km
		Water Body	1.854 sq km
		Population	2353
		Household	415
		Settlements	11
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Khuhra			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	23.453 sq km
		Kachcha Area	0.066 sq km
		Natural vegetation in wet areas	0.001 sq km
		Pakka Planned Area	0.129 sq km
		Pakka Unplanned Area	1.032 sq km
		Bridges	3
		Education Facilities	27
		Health Facilities	3
		Mobile Towers	2
		Petrol Pumps	1
		Settlements	26
		Irrigation and Drainage	13.174 km

		Network	
		Road Network	58.435 km
		Population	29399
		Household	4972
Heatwave	Low - High	Agriculture Area	23.424 sq km
		Kachcha Area	0.067 sq km
		Pakka Planned Area	0.128 sq km
		Pakka Unplanned Area	1.034 sq km
		Population	29417
		Household	4975
		Settlements	26
Meteorological Drought	Medium - Extreme	Settlements	26
		Agriculture Area	23.537 sq km
		Natural vegetation in wet areas	0.087 sq km
		Water Body	1.868 sq km
		Wet area	0.588 sq km
		Population	29552
		Household	4996
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Kolab Jial			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	11.799 sq km
		Kachcha Area	0.007 sq km
		Pakka Unplanned Area	0.259 sq km
		Education Facilities	7
		Settlements	10
		Irrigation and Drainage Network	2.597 km
		Road Network	18.487 km
		Population	4388
		Household	729

Heatwave	Low - High	Agriculture Area	11.79 sq km
		Kachcha Area	0.007 sq km
		Pakka Unplanned Area	0.259 sq km
		Population	4379
		Household	727
		Settlements	10
Meteorological Drought	Medium - Extreme	Settlements	10
		Agriculture Area	11.835 sq km
		Water Body	0.134 sq km
		Wet area	0.829 sq km
		Population	4415
		Household	732
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Kot Diji			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	6.181 sq km
		Kachcha Area	0.014 sq km
		Pakka Unplanned Area	0.95 sq km
		Education Facilities	13
		Settlements	9
		Tourist Places	1
		Irrigation and Drainage Network	1.817 km
		Road Network	15.416 km
		Population	13569
		Household	2277
Heatwave	Low - High	Agriculture Area	6.172 sq km
		Kachcha Area	0.014 sq km
		Pakka Unplanned Area	0.951 sq km
		Population	13596

		Household	2283
		Settlements	9
Meteorological Drought	Medium - Extreme	Settlements	9
		Agriculture Area	6.202 sq km
		Bare Area with sparse Natural Vegetation	2.256 sq km
		Population	13674
		Household	2294
Agricultural Drought	Low – Medium	Agriculture Area	0.485 sq km
		Bare Area with sparse Natural Vegetation	2.316 sq km
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kot Jubo			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	70.606 sq km
		Forest Area	0.003 sq km
		Kachcha Area	3.078 sq km
		Natural vegetation in wet areas	0.535 sq km
		Pakka Planned Area	1.118 sq km
		Pakka Unplanned Area	0.527 sq km
		Range Land	1.052 sq km
		Education Facilities	96
		Mobile Towers	2
		Petrol Pumps	2
		Settlements	87
		Irrigation and Drainage Network	42.475 km
		Road Network	1054.593 km
		Population	46844
		Household	8127
Heatwave	Low – Medium	Agriculture Area	70.064 sq km
		Kachcha Area	3.071 sq km

		Pakka Planned Area	1.117 sq km
		Pakka Unplanned Area	0.527 sq km
		Population	46760
		Household	8106
		Settlements	72
Meteorological Drought	Medium - Extreme	Settlements	87
		Agriculture Area	71.973 sq km
		Bare Area with sparse Natural Vegetation	8511.317 sq km
		Forest Area	0.179 sq km
		Natural vegetation in wet areas	36.32 sq km
		Range Land	82.91 sq km
		Water Body	39.391 sq km
		Wet area	2.232 sq km
		Population	47342
		Household	8210
Agricultural Drought	Low – Extreme	Agriculture Area	40.685 sq km
		Bare Area with sparse Natural Vegetation	10434.183 sq km
		Forest Area	0.16 sq km
		Natural vegetation in wet areas	32.211 sq km
		Range Land	99.766 sq km
		Water Body	45.796 sq km
		Wet area	0.87 sq km
		Population	29585
		Household	5188
		Settlements	34
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kot Lalu			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	88.251 sq km
		Forest Area	0.017 sq km

		Kachcha Area	0.876 sq km
		Pakka Planned Area	0.437 sq km
		Pakka Unplanned Area	1.189 sq km
		Range Land	0.206 sq km
		Education Facilities	57
		Settlements	139
		Irrigation and Drainage Network	50.496 km
		Railway Line	3.006 km
		Road Network	108.221 km
		Population	18218
		Household	3529
Heatwave	Low - High	Agriculture Area	88.069 sq km
		Kachcha Area	0.874 sq km
		Pakka Planned Area	0.438 sq km
		Pakka Unplanned Area	1.188 sq km
		Population	18199
		Household	3523
		Settlements	134
Meteorological Drought	Medium - Extreme	Settlements	139
		Agriculture Area	88.637 sq km
		Bare Area with sparse Natural Vegetation	26.952 sq km
		Forest Area	0.379 sq km
		Range Land	4.742 sq km
		Water Body	0.65 sq km
		Wet area	0.621 sq km
		Population	18366
		Household	3547
Agricultural Drought	Low - Extreme	Agriculture Area	53.7 sq km
		Bare Area with sparse Natural Vegetation	31.729 sq km
		Forest Area	0.463 sq km
		Range Land	5.92 sq km
		Water Body	0.814 sq km
		Wet area	0.11 sq km
		Population	4380
		Household	847
		Settlements	55
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

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

Kot Mir Muhammad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	93.374 sq km
		Kachcha Area	1.325 sq km
		Pakka Planned Area	0.015 sq km
		Pakka Unplanned Area	3.542 sq km
		Bridges	7
		Bus Stops	1
		Education Facilities	88
		Health Facilities	2
		Mobile Towers	5
		Petrol Pumps	4
		Settlements	139
		Irrigation and Drainage Network	51.204 km
		Road Network	118.989 km
		Population	87425
		Household	14888
Riverine Flood	Low - Medium	Agriculture Area	6.572 sq km
		Kachcha Area	0.026 sq km
		Education Facilities	3
		Settlements	1
		Road Network	3.589 km
		Population	420
		Household	69
Heatwave	Low - Medium	Agriculture Area	1.241 sq km
		Kachcha Area	1.304 sq km
		Pakka Planned Area	0.015 sq km
		Pakka Unplanned Area	3.509 sq km
		Population	86541
		Household	14733
		Settlements	121

Meteorological Drought	Medium - Extreme	Settlements	139
		Agriculture Area	93.552 sq km
		Water Body	0.136 sq km
		Wet area	0.987 sq km
		Population	88049
		Household	14996
Agricultural Drought	Low	Agriculture Area	4.43 sq km
		Population	861
		Household	142
		Settlements	3
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Kumb			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	25.763 sq km
		Forest Area	0.008 sq km
		Kachcha Area	0.519 sq km
		Pakka Planned Area	1.237 sq km
		Pakka Unplanned Area	1.199 sq km
		Range Land	0.044 sq km
		Bridges	2
		Education Facilities	50
		Grid Stations	1
		Health Facilities	2
		Mobile Towers	5
		Petrol Pumps	2
		Settlements	64
		Irrigation and Drainage Network	6.186 km
		Road Network	80.271 km
		Population	35992
		Household	6092
Heatwave	Low - High	Agriculture Area	25.712 sq km
		Kachcha Area	0.518 sq km
		Pakka Planned Area	1.237 sq km

		Pakka Unplanned Area	1.2 sq km
		Population	35989
		Household	6089
		Settlements	64
Meteorological Drought	Medium - Extreme	Agriculture Area	64
		Agriculture Area	25.877 sq km
		Forest Area	0.095 sq km
		Range Land	2.431 sq km
		Water Body	2.258 sq km
		Wet area	2.909 sq km
		Population	36284
		Household	6138
Agricultural Drought	Low - Medium	Agriculture Area	1.1 sq km
		Forest Area	0.118 sq km
		Range Land	2.705 sq km
		Water Body	0.14 sq km
		Wet area	0.008 sq km
		Population	76
		Household	13
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Layari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	47.896 sq km
		Kachcha Area	0.345 sq km
		Pakka Planned Area	0.465 sq km
		Pakka Unplanned Area	1.248 sq km
		Range Land	0.004 sq km
		Education Facilities	28
		Mobile Towers	1
		Settlements	65
		Irrigation and Drainage	36.917 km

		Road Network	133.809 km
		Population	23204
		Household	3989
Heatwave	Low - High	Agriculture Area	47.86 sq km
		Kachcha Area	0.347 sq km
		Pakka Planned Area	0.465 sq km
		Pakka Unplanned Area	1.249 sq km
		Population	23236
		Household	3996
		Settlements	61
Meteorological Drought	Medium - Extreme	Forest Area	65
		Agriculture Area	47.967 sq km
		Bare Area with sparse Natural Vegetation	0.037 sq km
		Range Land	0.08 sq km
		Water Body	0.221 sq km
		Wet area	0.004 sq km
		Population	23431
		Household	4024
Agricultural Drought	Low	Agriculture Area	0.479 sq km
		Range Land	0.034 sq km
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Machyoon			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	8.407 sq km
		Kachcha Area	0.09 sq km
		Pakka Unplanned Area	0.414 sq km
		Education Facilities	9
		Settlements	5
		Irrigation and Drainage Network	6.5 km
		Road Network	9.273 km

		Population	5741
		Household	1022
Heatwave	Medium	Agriculture Area	0.064 sq km
		Kachcha Area	0.089 sq km
		Pakka Unplanned Area	0.411 sq km
		Population	5696
		Household	1015
		Settlements	5
Meteorological Drought	Medium - Extreme	Water Body	5
		Agriculture Area	8.428 sq km
		Water Body	0.027 sq km
		Wet area	0.361 sq km
		Population	5787
		Household	1031
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Mad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	46.876 sq km
		Forest Area	0.007 sq km
		Kachcha Area	0.072 sq km
		Pakka Planned Area	1.168 sq km
		Pakka Unplanned Area	1.452 sq km
		Range Land	0.009 sq km
		Bridges	4
		Education Facilities	34
		Health Facilities	8
		Mobile Towers	7
		Petrol Pumps	3
		Police Stations	1

		Post Offices	1
		Settlements	46
		Irrigation and Drainage Network	24.412 km
		Road Network	101.142 km
		Population	52881
		Household	8215
Heatwave	Low - High	Agriculture Area	46.849 sq km
		Kachcha Area	0.072 sq km
		Pakka Planned Area	1.168 sq km
		Pakka Unplanned Area	1.456 sq km
		Population	52948
		Household	8226
		Settlements	46
Meteorological Drought	Medium - Extreme	Wet area	46
		Agriculture Area	46.962 sq km
		Forest Area	0.04 sq km
		Range Land	0.125 sq km
		Water Body	0.429 sq km
		Wet area	1.09 sq km
		Population	53190
		Household	8264
Agricultural Drought	Low	Agriculture Area	2.951 sq km
		Range Land	0.156 sq km
		Water Body	0.087 sq km
		Wet area	0.002 sq km
		Population	479
		Household	77
		Settlements	1
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Mandan

Hazard Type	Risk	Elements at Risk	
Earthquake	Low	Agriculture Area	52.462 sq km
		Kachcha Area	6.449 sq km
		Pakka Planned Area	0.026 sq km
		Pakka Unplanned Area	0.985 sq km
		Range Land	0.067 sq km
		Education Facilities	79
		Settlements	164
		Irrigation and Drainage Network	29.946 km
		Road Network	61.444 km
		Population	59184
		Household	10138
Heatwave	Low - High	Agriculture Area	52.322 sq km
		Kachcha Area	6.454 sq km
		Pakka Planned Area	0.026 sq km
		Pakka Unplanned Area	0.985 sq km
		Population	59216
		Household	10148
		Settlements	157
Meteorological Drought	Medium - Extreme	Agriculture Area	164
		Agriculture Area	52.739 sq km
		Bare Area with sparse Natural Vegetation	48.549 sq km
		Natural vegetation in wet areas	0.232 sq km
		Range Land	0.928 sq km
		Water Body	1.331 sq km
		Wet area	0.561 sq km
		Population	60072
		Household	10292
Agricultural Drought	Low - High	Agriculture Area	26.897 sq km
		Bare Area with sparse Natural Vegetation	40.368 sq km
		Natural vegetation in wet areas	0.291 sq km
		Range Land	1.088 sq km
		Water Body	1.67 sq km
		Wet area	0.34 sq km
		Population	24074
		Household	4124
		Settlements	48

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

Manghanwari			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	30.949 sq km
		Kachcha Area	0.243 sq km
		Pakka Planned Area	0.063 sq km
		Pakka Unplanned Area	1.475 sq km
		Bridges	1
		Education Facilities	25
		Health Facilities	1
		Petrol Pumps	3
		Settlements	48
		Irrigation and Drainage Network	10.332 km
		Road Network	39.413 km
		Population	33737
		Household	5664
Heatwave	Low - High	Agriculture Area	5.213 sq km
		Kachcha Area	0.24 sq km
		Pakka Planned Area	0.062 sq km
		Pakka Unplanned Area	1.466 sq km
		Population	33445
		Household	5616
		Settlements	41
Meteorological Drought	Medium - Extreme	Range Land	48
		Agriculture Area	31.018 sq km
		Wet area	0.604 sq km
		Population	34045
		Household	5717
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Mehar Ali			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	34.379 sq km
		Kachcha Area	0.089 sq km
		Pakka Planned Area	0.272 sq km
		Pakka Unplanned Area	1.414 sq km
		Bridges	6
		Education Facilities	25
		Grain Mandi	3
		Health Facilities	1
		Mobile Towers	5
		Petrol Pumps	11
		Police Stations	1
		Settlements	46
		Irrigation and Drainage Network	22.29 km
		Road Network	77.519 km
		Population	35367
		Household	6258
Heatwave	Low - Medium	Agriculture Area	0.786 sq km
		Kachcha Area	0.087 sq km
		Pakka Planned Area	0.269 sq km
		Pakka Unplanned Area	1.401 sq km
		Population	35037
		Household	6199
		Settlements	39
Meteorological Drought	Medium - Extreme	Water Body	46
		Agriculture Area	34.453 sq km
		Water Body	0.446 sq km
		Wet area	0.555 sq km
		Population	35652
		Household	6307

Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Mohsin Shah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	56.863 sq km
		Kachcha Area	0.309 sq km
		Natural vegetation in wet areas	0.003 sq km
		Pakka Planned Area	0.039 sq km
		Pakka Unplanned Area	1.257 sq km
		Range Land	0.103 sq km
		Bridges	1
		Education Facilities	68
		Settlements	77
		Irrigation and Drainage Network	34.3 km
		Road Network	99.591 km
		Population	12909
		Household	2171
Heatwave	Low - High	Agriculture Area	56.771 sq km
		Kachcha Area	0.309 sq km
		Pakka Planned Area	0.039 sq km
		Pakka Unplanned Area	1.259 sq km
		Population	12919
		Household	2172
		Settlements	76
Meteorological Drought	Medium - Extreme	Wet area	77
		Agriculture Area	57.026 sq km
		Bare Area with sparse Natural Vegetation	0.078 sq km
		Natural vegetation in wet areas	0.108 sq km
		Range Land	3.051 sq km
		Water Body	1.171 sq km
		Wet area	3.676 sq km

		Population	13040
		Household	2191
Agricultural Drought	Low - Medium	Agriculture Area	4.689 sq km
		Natural vegetation in wet areas	0.134 sq km
		Range Land	3.406 sq km
		Water Body	1.42 sq km
		Wet area	0.072 sq km
		Population	577
		Household	98
		Settlements	2
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Mori			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	24.229 sq km
		Kachcha Area	0.019 sq km
		Natural vegetation in wet areas	0.029 sq km
		Pakka Planned Area	0.303 sq km
		Pakka Unplanned Area	1.054 sq km
		Bridges	4
		Education Facilities	27
		Mobile Towers	3
		Petrol Pumps	5
		Settlements	22
		Irrigation and Drainage Network	12.742 km
		Road Network	32.079 km
		Population	16002
		Household	2844
Riverine Flood	Low - High	Agriculture Area	8.955 sq km
		Natural vegetation in wet areas	1.36 sq km
		Pakka Unplanned Area	0.025 sq km
		Education Facilities	1

		Population	287
		Household	51
Heatwave	Low - Medium	Agriculture Area	0.168 sq km
		Kachcha Area	0.019 sq km
		Pakka Planned Area	0.3 sq km
		Pakka Unplanned Area	1.042 sq km
		Population	15814
		Household	2809
		Settlements	21
Meteorological Drought	Medium - Extreme	Agriculture Area	22
		Agriculture Area	24.302 sq km
		Natural vegetation in wet areas	4.199 sq km
		Range Land	0.035 sq km
		Water Body	0.036 sq km
		Population	16126
		Household	2866
Agricultural Drought	Low	Agriculture Area	0.341 sq km
		Natural vegetation in wet areas	1.126 sq km
		Range Land	0.044 sq km
		Water Body	0.046 sq km
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Muhba Wah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	65.559 sq km
		Kachcha Area	2.138 sq km
		Natural vegetation in wet areas	0.075 sq km
		Pakka Planned Area	0.911 sq km
		Pakka Unplanned Area	1.746 sq km
		Range Land	0.115 sq km
		Education Facilities	63
		Settlements	107
		Tourist Places	3
		Irrigation and Drainage Network	34.688 km

		Road Network	152.914 km
		Population	54016
		Household	9228
Heatwave	Low - High	Agriculture Area	65.48 sq km
		Kachcha Area	2.141 sq km
		Pakka Planned Area	0.911 sq km
		Pakka Unplanned Area	1.747 sq km
		Population	54051
		Household	9232
		Settlements	104
Meteorological Drought	Medium - Extreme	Bare Area with sparse Natural Vegetation	107
		Agriculture Area	65.788 sq km
		Bare Area with sparse Natural Vegetation	5.141 sq km
		Natural vegetation in wet areas	1.019 sq km
		Range Land	1.648 sq km
		Water Body	1.108 sq km
		Wet area	7.75 sq km
		Population	53774
		Household	9184
Agricultural Drought	Low - Medium	Agriculture Area	8.465 sq km
		Bare Area with sparse Natural Vegetation	2.423 sq km
		Natural vegetation in wet areas	1.244 sq km
		Range Land	1.641 sq km
		Water Body	0.198 sq km
		Wet area	1.727 sq km
		Population	1853
		Household	316
		Settlements	1
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Nasir Faqir			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	24.78 sq km
		Kachcha Area	0.216 sq km
		Natural vegetation in wet areas	0.148 sq km
		Pakka Planned Area	0.014 sq km
		Pakka Unplanned Area	1.553 sq km
		Range Land	0.071 sq km
		Education Facilities	43
		Health Facilities	3
		Police Stations	1
		Post Offices	1
		Settlements	52
		Tourist Places	1
		Irrigation and Drainage Network	16.692 km
		Road Network	60.546 km
		Population	30842
		Household	5413
Heatwave	Low - High	Agriculture Area	24.734 sq km
		Kachcha Area	0.215 sq km
		Pakka Planned Area	0.014 sq km
		Pakka Unplanned Area	1.553 sq km
		Population	30826
		Household	5410
		Settlements	48
Meteorological Drought	Medium - Extreme	Forest Area	52
		Agriculture Area	24.901 sq km
		Bare Area with sparse Natural Vegetation	0.354 sq km
		Natural vegetation in wet areas	1.701 sq km
		Range Land	2.031 sq km
		Water Body	1.634 sq km
		Wet area	1.863 sq km
		Population	31019
		Household	5441
Agricultural Drought	Low - Medium	Agriculture Area	2.598 sq km
		Bare Area with sparse Natural Vegetation	0.002 sq km
		Natural vegetation in wet areas	0.12 sq km
		Range Land	2.54 sq km

		Water Body	1.164 sq km
		Wet area	0.056 sq km
		Population	464
		Household	79
		Settlements	1
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Nizamani			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	25.796 sq km
		Kachcha Area	0.168 sq km
		Pakka Planned Area	1.457 sq km
		Pakka Unplanned Area	4.407 sq km
		Ambulance Services	1
		Bridges	13
		Bus Stops	1
		Education Facilities	61
		Grid Stations	1
		Health Facilities	12
		Mobile Towers	11
		Petrol Pumps	11
		Police Stations	1
		Settlements	47
		Irrigation and Drainage Network	25.871 km
		Railway Line	12.084 km
		Road Network	71.465 km
		Population	146602
		Household	25647
Heatwave	Low - High	Agriculture Area	7.543 sq km
		Kachcha Area	0.167 sq km
		Pakka Planned Area	1.455 sq km
		Pakka Unplanned Area	4.396 sq km
		Population	146096

		Household	25559
		Settlements	46
Meteorological Drought	Medium - Extreme	Natural vegetation in wet areas	47
		Agriculture Area	25.901 sq km
		Water Body	0.549 sq km
		Wet area	1.439 sq km
		Population	146996
		Household	25716
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Noorpur			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	24.852 sq km
		Forest Area	0.013 sq km
		Kachcha Area	0.193 sq km
		Pakka Unplanned Area	0.729 sq km
		Education Facilities	34
		Settlements	34
		Irrigation and Drainage Network	17.422 km
		Road Network	35.106 km
		Population	15182
		Household	2519
Heatwave	Low - High	Agriculture Area	18.161 sq km
		Kachcha Area	0.191 sq km
		Pakka Unplanned Area	0.726 sq km
		Population	15105
		Household	2508
		Settlements	34
Meteorological Drought	Medium - Extreme	Range Land	34

		Agriculture Area	24.902 sq km
		Forest Area	0.183 sq km
		Water Body	0.131 sq km
		Wet area	0.759 sq km
		Population	15293
		Household	2538
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Pacca Chang			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	62.832 sq km
		Forest Area	0.002 sq km
		Kachcha Area	0.281 sq km
		Pakka Planned Area	0.841 sq km
		Pakka Unplanned Area	1.555 sq km
		Range Land	0.017 sq km
		Bridges	1
		Education Facilities	63
		Mobile Towers	1
		Petrol Pumps	5
		Post Offices	1
		Settlements	147
		Irrigation and Drainage Network	30.883 km
		Road Network	131.533 km
		Population	39882
		Household	7846
Heatwave	Low - High	Agriculture Area	62.789 sq km
		Kachcha Area	0.281 sq km
		Pakka Planned Area	0.841 sq km
		Pakka Unplanned Area	1.555 sq km
		Population	39886

		Household	7850
		Settlements	147
Meteorological Drought	Medium - Extreme	Water Body	147
		Agriculture Area	62.901 sq km
		Bare Area with sparse Natural Vegetation	0.007 sq km
		Forest Area	0.013 sq km
		Range Land	0.598 sq km
		Water Body	0.014 sq km
		Population	40075
		Household	7870
Agricultural Drought	Low - Medium	Agriculture Area	12.73 sq km
		Bare Area with sparse Natural Vegetation	0.009 sq km
		Forest Area	0.016 sq km
		Range Land	0.739 sq km
		Water Body	0.017 sq km
		Population	1076
		Household	209
		Settlements	5
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Pir Hayat Shah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	62.051 sq km
		Kachcha Area	0.488 sq km
		Natural vegetation in wet areas	0.112 sq km
		Pakka Planned Area	0.272 sq km
		Pakka Unplanned Area	1.987 sq km
		Education Facilities	55
		Mobile Towers	2
		Petrol Pumps	1
		Settlements	76

		Irrigation and Drainage Network	31.248 km
		Road Network	120.984 km
		Population	32322
		Household	5339
Riverine Flood	Low - High	Agriculture Area	30.718 sq km
		Kachcha Area	0.451 sq km
		Natural vegetation in wet areas	3.07 sq km
		Pakka Unplanned Area	0.029 sq km
		Education Facilities	17
		Settlements	7
		Irrigation and Drainage Network	4.827 km
		Road Network	26.741 km
		Population	5447
		Household	894
Heatwave	Low - High	Agriculture Area	62.005 sq km
		Kachcha Area	0.488 sq km
		Pakka Planned Area	0.272 sq km
		Pakka Unplanned Area	1.988 sq km
		Population	32336
		Household	5342
		Settlements	73
Meteorological Drought	Medium - Extreme	Wet area	76
		Agriculture Area	62.237 sq km
		Natural vegetation in wet areas	21.675 sq km
		Water Body	0.336 sq km
		Population	32599
		Household	5384
Agricultural Drought	Low - High	Agriculture Area	32.554 sq km
		Natural vegetation in wet areas	24.279 sq km
		Water Body	0.4 sq km
		Population	3483
		Household	575
		Settlements	9
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone

Pir Jo Goth			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	10.076 sq km
		Kachcha Area	0.045 sq km
		Pakka Planned Area	0.238 sq km
		Pakka Unplanned Area	0.377 sq km
		Education Facilities	8
		Health Facilities	1
		Settlements	11
		Irrigation and Drainage Network	1.825 km
		Road Network	11.663 km
		Population	10861
		Household	1802
Heatwave	Low - Medium	Agriculture Area	0.131 sq km
		Kachcha Area	0.044 sq km
		Pakka Planned Area	0.236 sq km
		Pakka Unplanned Area	0.372 sq km
		Population	10748
		Household	1784
		Settlements	10
Meteorological Drought	Medium - Extreme	Agriculture Area	11
		Agriculture Area	10.094 sq km
		Water Body	0.097 sq km
		Wet area	0.003 sq km
		Population	10928
		Household	1812
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Pir Yaloi			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	22.093 sq km
		Kachcha Area	0.133 sq km
		Natural vegetation in wet areas	0.001 sq km
		Pakka Unplanned Area	0.865 sq km
		Bridges	1
		Education Facilities	18
		Mobile Towers	1
		Settlements	43
		Irrigation and Drainage Network	13.561 km
		Road Network	26.665 km
		Population	14083
		Household	2402
Riverine Flood	Low - Extreme	Agriculture Area	6.671 sq km
		Kachcha Area	0.016 sq km
		Natural vegetation in wet areas	0.664 sq km
		Education Facilities	1
		Settlements	1
		Road Network	0.127 km
		Population	178
		Household	32
Heatwave	Medium	Agriculture Area	0.186 sq km
		Kachcha Area	0.131 sq km
		Pakka Unplanned Area	0.851 sq km
		Population	13849
		Household	2359
		Settlements	41
Meteorological Drought	Medium - Extreme	Range Land	43
		Agriculture Area	22.147 sq km
		Natural vegetation in wet areas	1.36 sq km
		Water Body	0.045 sq km
		Wet area	0.379 sq km
		Population	14236
		Household	2427
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	

Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Rani Purun			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	18.558 sq km
		Forest Area	0.011 sq km
		Kachcha Area	0.07 sq km
		Natural vegetation in wet areas	0.028 sq km
		Pakka Planned Area	2.892 sq km
		Pakka Unplanned Area	0.357 sq km
		Range Land	0.02 sq km
		Bridges	1
		Bus Stops	1
		Education Facilities	30
		Health Facilities	1
		Mobile Towers	10
		Petrol Pumps	8
		Post Offices	1
		Settlements	22
		Irrigation and Drainage Network	21.13 km
		Railway Line	2.086 km
		Road Network	54.796 km
		Population	38757
		Household	6376
Heatwave	Low - High	Agriculture Area	18.531 sq km
		Kachcha Area	0.07 sq km
		Pakka Planned Area	2.892 sq km
		Pakka Unplanned Area	0.358 sq km
		Population	38752
		Household	6376
		Settlements	22
Meteorological Drought	Medium - Extreme	Water Body	22
		Agriculture Area	18.617 sq km
		Forest Area	0.122 sq km
		Natural vegetation in wet areas	0.474 sq km
		Range Land	0.239 sq km

		Water Body	0.818 sq km
		Wet area	0.587 sq km
		Population	38883
		Household	6397
Agricultural Drought	Low	Agriculture Area	0.398 sq km
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Rasoolabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	46.358 sq km
		Forest Area	0.009 sq km
		Kachcha Area	0.089 sq km
		Natural vegetation in wet areas	0.006 sq km
		Pakka Planned Area	1.277 sq km
		Pakka Unplanned Area	1.462 sq km
		Education Facilities	42
		Industries	1
		Mobile Towers	4
		Petrol Pumps	7
		Settlements	51
		Irrigation and Drainage Network	17.587 km
		Road Network	82.067 km
		Population	40963
		Household	6789
Heatwave	Low - High	Agriculture Area	46.305 sq km
		Kachcha Area	0.09 sq km
		Pakka Planned Area	1.278 sq km
		Pakka Unplanned Area	1.465 sq km
		Population	41014
		Household	6802
		Settlements	50

Meteorological Drought	Medium - Extreme	Wet area	51
		Agriculture Area	46.458 sq km
		Forest Area	0.234 sq km
		Natural vegetation in wet areas	0.239 sq km
		Water Body	1.32 sq km
		Wet area	0.506 sq km
		Population	41205
		Household	6832
Agricultural Drought	Low	Agriculture Area	2.417 sq km
		Forest Area	0.29 sq km
		Water Body	0.197 sq km
		Population	18
		Household	3
		Settlements	2
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Razabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	83.189 sq km
		Kachcha Area	2.391 sq km
		Pakka Unplanned Area	0.54 sq km
		Range Land	0.085 sq km
		Education Facilities	39
		Settlements	104
		Irrigation and Drainage Network	42.648 km
		Road Network	75.396 km
		Population	21341
		Household	4126
Heatwave	Low - High	Agriculture Area	82.895 sq km
		Kachcha Area	2.389 sq km
		Pakka Unplanned Area	0.539 sq km
		Population	21328

		Household	4125
		Settlements	91
Meteorological Drought	Medium - Extreme	Agriculture Area	104
		Agriculture Area	83.894 sq km
		Bare Area with sparse Natural Vegetation	243.962 sq km
		Forest Area	0.266 sq km
		Natural vegetation in wet areas	1.045 sq km
		Range Land	1.767 sq km
		Water Body	1.313 sq km
		Population	21670
		Household	4186
Agricultural Drought	Low - Extreme	Agriculture Area	104.615 sq km
		Bare Area with sparse Natural Vegetation	282.167 sq km
		Forest Area	0.333 sq km
		Natural vegetation in wet areas	1.31 sq km
		Range Land	2.213 sq km
		Water Body	1.643 sq km
		Population	27169
		Household	5255
		Settlements	103
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Ripri			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	94.311 sq km
		Kachcha Area	2.158 sq km
		Natural vegetation in wet areas	0.122 sq km
		Pakka Unplanned Area	0.763 sq km
		Education Facilities	28
		Settlements	61
		Irrigation and Drainage Network	15.875 km

		Road Network	92.99 km
		Population	31756
		Household	5174
Riverine Flood	Low – High	Agriculture Area	71.489 sq km
		Kachcha Area	1.986 sq km
		Natural vegetation in wet areas	1.649 sq km
		Pakka Unplanned Area	0.007 sq km
		Education Facilities	13
		Settlements	28
		Road Network	39.404 km
		Population	21061
		Household	3425
Heatwave	Low – High	Agriculture Area	78.659 sq km
		Kachcha Area	2.158 sq km
		Pakka Unplanned Area	0.764 sq km
		Population	31772
		Household	5173
		Settlements	60
Meteorological Drought	Medium - Extreme	Water Body	59
		Agriculture Area	94.543 sq km
		Natural vegetation in wet areas	19.858 sq km
		Water Body	1.767 sq km
		Population	31454
		Household	5124
Agricultural Drought	Low - High	Agriculture Area	85.496 sq km
		Natural vegetation in wet areas	24.485 sq km
		Water Body	1.036 sq km
		Population	12163
		Household	1978
		Settlements	20
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sabar Rind			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	32.241 sq km
		Forest Area	0.07 sq km
		Kachcha Area	3.671 sq km
		Natural vegetation in wet areas	0.02 sq km
		Pakka Planned Area	0.056 sq km
		Pakka Unplanned Area	2.026 sq km
		Range Land	0.148 sq km
		Education Facilities	137
		Settlements	94
		Irrigation and Drainage Network	21.68 km
		Road Network	63.175 km
		Population	46245
		Household	7775
Heatwave	Low - High	Agriculture Area	32.16 sq km
		Kachcha Area	3.674 sq km
		Pakka Planned Area	0.056 sq km
		Pakka Unplanned Area	2.026 sq km
		Population	46269
		Household	7778
		Settlements	86
Meteorological Drought	Medium - Extreme	Wet area	92
		Agriculture Area	32.379 sq km
		Bare Area with sparse Natural Vegetation	5.477 sq km
		Forest Area	0.163 sq km
		Natural vegetation in wet areas	0.302 sq km
		Range Land	1.218 sq km
		Water Body	4.301 sq km
		Wet area	5.456 sq km
		Population	44266
		Household	7440
Agricultural Drought	Low - Medium	Agriculture Area	2.462 sq km
		Bare Area with sparse Natural Vegetation	1.677 sq km
		Forest Area	0.141 sq km
		Natural vegetation in wet areas	0.373 sq km
		Range Land	1.507 sq km
		Water Body	3.981 sq km

		Wet area	0.246 sq km
		Population	4499
		Household	757
		Settlements	4
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Sader Ji			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	34.502 sq km
		Kachcha Area	0.428 sq km
		Natural vegetation in wet areas	0.001 sq km
		Pakka Unplanned Area	1.162 sq km
		Education Facilities	25
		Mobile Towers	2
		Settlements	39
		Irrigation and Drainage Network	13.456 km
		Road Network	65.66 km
		Population	39953
		Household	6812
Riverine Flood	Low - Medium	Agriculture Area	2.029 sq km
		Natural vegetation in wet areas	0.001 sq km
		Road Network	0.22 km
Heatwave	Low - High	Agriculture Area	12.807 sq km
		Kachcha Area	0.425 sq km
		Pakka Unplanned Area	1.158 sq km
		Population	39794
		Household	6783
		Settlements	38
Meteorological Drought	Medium - Extreme	Agriculture Area	39
		Agriculture Area	34.565 sq km
		Natural vegetation in wet areas	0.037 sq km

		Water Body	0.52 sq km
		Wet area	0.18 sq km
		Population	40249
		Household	6861
Agricultural Drought	Low – Medium	Agriculture Area	2.578 sq km
		Natural vegetation in wet areas	0.047 sq km
		Water Body	0.002 sq km
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sag Yoon			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	118.364 sq km
		Kachcha Area	0.56 sq km
		Natural vegetation in wet areas	0.1 sq km
		Pakka Planned Area	0.459 sq km
		Pakka Unplanned Area	0.911 sq km
		Bridges	1
		Education Facilities	39
		Settlements	57
		Irrigation and Drainage Network	8.779 km
		Road Network	94.603 km
		Population	22471
		Household	3725
Riverine Flood	Low - High	Agriculture Area	92.734 sq km
		Kachcha Area	0.393 sq km
		Natural vegetation in wet areas	2.014 sq km
		Pakka Unplanned Area	0.002 sq km
		Education Facilities	19
		Settlements	11
		Road Network	42.828 km
		Population	4682
		Household	777
Heatwave	Low - High	Agriculture Area	118.286 sq km

		Kachcha Area	0.559 sq km
		Pakka Planned Area	0.459 sq km
		Pakka Unplanned Area	0.912 sq km
		Population	22476
		Household	3728
		Settlements	56
Meteorological Drought	Medium - Extreme	Natural vegetation in wet areas	57
		Agriculture Area	118.621 sq km
		Natural vegetation in wet areas	18.771 sq km
		Water Body	0.843 sq km
		Population	22660
		Household	3755
Agricultural Drought	Low - High	Agriculture Area	123.649 sq km
		Natural vegetation in wet areas	23.055 sq km
		Water Body	1.067 sq km
		Population	11744
		Household	1945
		Settlements	20
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sami			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	53.048 sq km
		Forest Area	0.012 sq km
		Kachcha Area	0.058 sq km
		Pakka Planned Area	0.534 sq km
		Pakka Unplanned Area	1.484 sq km
		Range Land	0.004 sq km
		Education Facilities	40
		Health Facilities	1
		Mobile Towers	4
		Settlements	54
		Irrigation and Drainage Network	31.883 km
		Road Network	117.309 km

		Population	29280
		Household	4856
Heatwave	Low - High	Agriculture Area	53.007 sq km
		Kachcha Area	0.058 sq km
		Pakka Planned Area	0.535 sq km
		Pakka Unplanned Area	1.487 sq km
		Population	29355
		Household	4868
		Settlements	54
Meteorological Drought	Medium - Extreme	Range Land	54
		Agriculture Area	53.123 sq km
		Forest Area	0.39 sq km
		Range Land	0.166 sq km
		Wet area	2.158 sq km
		Population	29498
		Household	4890
Agricultural Drought	Low	Agriculture Area	1.604 sq km
		Forest Area	0.486 sq km
		Range Land	0.207 sq km
		Wet area	0.006 sq km
		Population	58
		Household	11
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	

Setarja			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	55.235 sq km
		Kachcha Area	0.026 sq km
		Natural vegetation in wet areas	0.643 sq km
		Pakka Planned Area	1.095 sq km
		Pakka Unplanned Area	2.228 sq km

		Range Land	0.136 sq km
		Bridges	4
		Education Facilities	66
		Health Facilities	1
		Mobile Towers	4
		Petrol Pumps	1
		Settlements	58
		Irrigation and Drainage Network	45.763 km
		Railway Line	11.838 km
		Road Network	123.057 km
		Population	52173
		Household	8701
Heatwave	Low - High	Agriculture Area	55.159 sq km
		Kachcha Area	0.026 sq km
		Pakka Planned Area	1.096 sq km
		Pakka Unplanned Area	2.234 sq km
		Population	52228
		Household	8710
		Settlements	57
Meteorological Drought	Medium - Extreme	Water Body	58
		Agriculture Area	55.392 sq km
		Natural vegetation in wet areas	7.812 sq km
		Range Land	1.952 sq km
		Water Body	0.718 sq km
		Wet area	3.685 sq km
		Population	52511
		Household	8758
Agricultural Drought	Low	Agriculture Area	0.17 sq km
		Range Land	0.397 sq km
		Water Body	0.014 sq km
		Wet area	0.001 sq km
		Population	71
		Household	11
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood

Shadi Shaheed			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	53.079 sq km
		Kachcha Area	0.587 sq km
		Pakka Planned Area	0.991 sq km
		Pakka Unplanned Area	2.879 sq km
		Bridges	2
		Education Facilities	52
		Health Facilities	4
		Mobile Towers	5
		Petrol Pumps	1
		Settlements	82
		Tourist Places	1
		Irrigation and Drainage Network	37.567 km
		Road Network	146.601 km
		Population	55378
		Household	9723
Heatwave	Low - High	Agriculture Area	52.509 sq km
		Kachcha Area	0.585 sq km
		Pakka Planned Area	0.99 sq km
		Pakka Unplanned Area	2.88 sq km
		Population	55386
		Household	9720
		Settlements	79
Meteorological Drought	Medium - Extreme	Wet area	81
		Agriculture Area	53.185 sq km
		Bare Area with sparse Natural Vegetation	13.069 sq km
		Forest Area	0.002 sq km
		Range Land	1.147 sq km
		Water Body	0.127 sq km
		Wet area	0.582 sq km
		Population	55715
		Household	9781
Agricultural Drought	Low - High	Agriculture Area	2.352 sq km
		Bare Area with sparse Natural	16.579 sq km

		Vegetation	
		Forest Area	0.003 sq km
		Range Land	1.455 sq km
		Wet area	0.001 sq km
		Population	2328
		Household	414
		Settlements	4
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sikandarabad			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	47.589 sq km
		Kachcha Area	0.745 sq km
		Natural vegetation in wet areas	0.271 sq km
		Pakka Planned Area	0.178 sq km
		Pakka Unplanned Area	0.846 sq km
		Range Land	0.006 sq km
		Bridges	1
		Education Facilities	60
		Health Facilities	1
		Mobile Towers	1
		Petrol Pumps	2
		Police Stations	1
		Settlements	39
		Irrigation and Drainage Network	41.332 km
		Road Network	73.763 km
		Population	22652
		Household	4026
Heatwave	Low - High	Agriculture Area	47.368 sq km
		Kachcha Area	0.746 sq km
		Pakka Planned Area	0.179 sq km
		Pakka Unplanned Area	0.847 sq km
		Population	22689

		Household	4032
		Settlements	30
Meteorological Drought	Medium - Extreme	Agriculture Area	39
		Agriculture Area	48.206 sq km
		Bare Area with sparse Natural Vegetation	86.287 sq km
		Natural vegetation in wet areas	2.093 sq km
		Range Land	0.187 sq km
		Water Body	2.269 sq km
		Wet area	0.238 sq km
		Population	22927
		Household	4075
Agricultural Drought	Low - Extreme	Agriculture Area	28.508 sq km
		Bare Area with sparse Natural Vegetation	95.761 sq km
		Natural vegetation in wet areas	1.726 sq km
		Range Land	0.234 sq km
		Water Body	2.569 sq km
		Population	20247
		Household	3609
		Settlements	20
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sobho Dero			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	32.539 sq km
		Forest Area	0.004 sq km
		Kachcha Area	0.072 sq km
		Pakka Planned Area	0.009 sq km
		Pakka Unplanned Area	0.654 sq km
		Bridges	1
		Education Facilities	20
		Settlements	49

		Irrigation and Drainage Network	20.754 km
		Road Network	77.055 km
		Population	8960
		Household	1481
Heatwave	Low - High	Agriculture Area	32.527 sq km
		Kachcha Area	0.072 sq km
		Pakka Planned Area	0.009 sq km
		Pakka Unplanned Area	0.655 sq km
		Population	8972
		Household	1485
		Settlements	48
Meteorological Drought	Medium - High	Bare Area with sparse Natural Vegetation	49
		Agriculture Area	32.575 sq km
		Forest Area	0.059 sq km
		Wet area	0.398 sq km
		Population	9038
		Household	1494
Agricultural Drought	Low	Agriculture Area	0.001 sq km
		Forest Area	0.031 sq km
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Sohu			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	45.148 sq km
		Kachcha Area	0.955 sq km
		Pakka Planned Area	0.295 sq km
		Pakka Unplanned Area	1.316 sq km
		Range Land	0.086 sq km
		Education Facilities	41
		Settlements	45
		Irrigation and Drainage Network	35.564 km

		Road Network	130.684 km
		Population	28393
		Household	4892
Heatwave	Low - High	Agriculture Area	45.109 sq km
		Kachcha Area	0.953 sq km
		Pakka Planned Area	0.294 sq km
		Pakka Unplanned Area	1.316 sq km
		Population	28360
		Household	4886
		Settlements	41
Meteorological Drought	Medium - Extreme	Forest Area	45
		Agriculture Area	45.247 sq km
		Bare Area with sparse Natural Vegetation	8.102 sq km
		Range Land	2.136 sq km
		Water Body	0.094 sq km
		Population	28414
		Household	4893
Agricultural Drought	Low - High	Agriculture Area	6.252 sq km
		Bare Area with sparse Natural Vegetation	4.96 sq km
		Range Land	1.857 sq km
		Population	1269
		Household	218
		Settlements	2
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Tajjal			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	100.365 sq km
		Forest Area	0.009 sq km
		Kachcha Area	1.429 sq km

		Natural vegetation in wet areas	1.842 sq km
		Pakka Planned Area	1.593 sq km
		Pakka Unplanned Area	0.246 sq km
		Range Land	0.048 sq km
		Bridges	1
		Education Facilities	85
		Mobile Towers	2
		Petrol Pumps	2
		Power Plant	1
		Settlements	67
		Irrigation and Drainage Network	71.428 km
		Road Network	173.893 km
		Population	34809
		Household	6156
Heatwave	Low - High	Agriculture Area	99.828 sq km
		Kachcha Area	1.43 sq km
		Pakka Planned Area	1.595 sq km
		Pakka Unplanned Area	0.247 sq km
		Population	34855
		Household	6164
		Settlements	56
Meteorological Drought	Medium - Extreme	Natural vegetation in wet areas	67
		Agriculture Area	101.678 sq km
		Bare Area with sparse Natural Vegetation	167.078 sq km
		Forest Area	0.19 sq km
		Natural vegetation in wet areas	42.187 sq km
		Range Land	3.016 sq km
		Water Body	2.937 sq km
		Wet area	0.362 sq km
		Population	35159
		Household	6219
Agricultural Drought	Low - Extreme	Agriculture Area	62.472 sq km
		Bare Area with sparse Natural Vegetation	182.491 sq km
		Forest Area	0.236 sq km
		Natural vegetation in wet areas	14.235 sq km
		Range Land	2.69 sq km
		Water Body	3.394 sq km
		Wet area	0.328 sq km

		Population	29090
		Household	5147
		Settlements	33
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Tando Masti			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	128.414 sq km
		Forest Area	0.006 sq km
		Kachcha Area	1.117 sq km
		Natural vegetation in wet areas	0.173 sq km
		Pakka Planned Area	2.044 sq km
		Pakka Unplanned Area	5.062 sq km
		Range Land	0.142 sq km
		Bridges	15
		Education Facilities	145
		Health Facilities	8
		Mobile Towers	15
		Petrol Pumps	25
		Post Offices	3
		Settlements	158
		Irrigation and Drainage Network	129.197 km
		Railway Line	17.696 km
		Road Network	323.578 km
		Population	134358
		Household	22277
Heatwave	Low - High	Agriculture Area	128.244 sq km
		Kachcha Area	1.118 sq km
		Pakka Planned Area	2.044 sq km
		Pakka Unplanned Area	5.066 sq km
		Population	134377
		Household	22283
		Settlements	153

Meteorological Drought	Medium - Extreme	Water Body	158
		Agriculture Area	128.853 sq km
		Forest Area	0.193 sq km
		Natural vegetation in wet areas	4.497 sq km
		Range Land	1.136 sq km
		Water Body	5.108 sq km
		Wet area	16.091 sq km
		Population	135192
		Household	22410
Agricultural Drought	Low	Agriculture Area	0.103 sq km
		Natural vegetation in wet areas	0.033 sq km
		Range Land	0.063 sq km
		Water Body	0.004 sq km
		Wet area	0.003 sq km
		Population	108
		Household	18
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Tando Mir Ali			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	41.844 sq km
		Kachcha Area	0.207 sq km
		Natural vegetation in wet areas	0.081 sq km
		Pakka Planned Area	0.152 sq km
		Pakka Unplanned Area	1.874 sq km
		Range Land	0.019 sq km
		Education Facilities	49
		Settlements	79
		Irrigation and Drainage Network	12.785 km
		Road Network	63.581 km
		Population	38889
		Household	6548

Heatwave	Low - High	Agriculture Area	41.795 sq km
		Kachcha Area	0.208 sq km
		Pakka Planned Area	0.152 sq km
		Pakka Unplanned Area	1.873 sq km
		Population	38910
		Household	6553
		Settlements	78
Meteorological Drought	Medium - Extreme	Wet area	79
		Agriculture Area	41.944 sq km
		Bare Area with sparse Natural Vegetation	4.515 sq km
		Forest Area	0.006 sq km
		Natural vegetation in wet areas	0.63 sq km
		Range Land	0.242 sq km
		Wet area	0.455 sq km
		Population	39133
		Household	6585
Agricultural Drought	Low - Medium	Agriculture Area	29.83 sq km
		Bare Area with sparse Natural Vegetation	5.375 sq km
		Natural vegetation in wet areas	0.792 sq km
		Range Land	0.137 sq km
		Wet area	0.573 sq km
		Population	17384
		Household	2926
		Settlements	32
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Thari Mirwah			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	15.302 sq km
		Kachcha Area	1.866 sq km
		Pakka Unplanned Area	0.312 sq km
		Range Land	0.01 sq km
		Education Facilities	27

		Settlements	39
		Irrigation and Drainage Network	10.394 km
		Road Network	34.005 km
		Population	18721
		Household	3190
Heatwave	Low - High	Agriculture Area	15.271 sq km
		Kachcha Area	1.867 sq km
		Pakka Unplanned Area	0.311 sq km
		Population	18715
		Household	3193
		Settlements	36
Meteorological Drought	Medium - Extreme	Agriculture Area	39
		Agriculture Area	15.362 sq km
		Bare Area with sparse Natural Vegetation	19.739 sq km
		Natural vegetation in wet areas	0.137 sq km
		Range Land	0.819 sq km
		Water Body	2.104 sq km
		Wet area	0.337 sq km
		Population	18941
		Household	3229
Agricultural Drought	Low – Extreme	Agriculture Area	7.129 sq km
		Bare Area with sparse Natural Vegetation	21.575 sq km
		Natural vegetation in wet areas	0.172 sq km
		Range Land	1.015 sq km
		Water Body	2.645 sq km
		Wet area	0.424 sq km
		Population	10691
		Household	1850
		Settlements	10
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	

Therhi			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	5.77 sq km
		Kachcha Area	0.017 sq km
		Pakka Planned Area	0.02 sq km
		Pakka Unplanned Area	0.621 sq km
		Bridges	2
		Education Facilities	5
		Mobile Towers	1
		Settlements	5
		Irrigation and Drainage Network	9.658 km
		Road Network	16.714 km
		Population	15484
		Household	2735
Heatwave	Low - Medium	Agriculture Area	0.108 sq km
		Kachcha Area	0.016 sq km
		Pakka Planned Area	0.02 sq km
		Pakka Unplanned Area	0.617 sq km
		Population	15348
		Household	2711
		Settlements	5
Meteorological Drought	Medium - Extreme	Water Body	5
		Agriculture Area	5.776 sq km
		Population	15503
		Household	2738
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Cyclone	Nil	The UC falls out of vulnerable zone for Cyclone	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Veesar			
Hazard Type	**Risk**	**Elements at Risk**	
Earthquake	Low	Agriculture Area	44.386 sq km

		Forest Area	0.059 sq km
		Kachcha Area	0.783 sq km
		Pakka Planned Area	0.046 sq km
		Pakka Unplanned Area	2.188 sq km
		Range Land	0.205 sq km
		Education Facilities	74
		Settlements	112
		Irrigation and Drainage Network	19.635 km
		Road Network	79.741 km
		Population	24254
		Household	4086
Heatwave	Low - High	Agriculture Area	44.319 sq km
		Kachcha Area	0.785 sq km
		Pakka Planned Area	0.046 sq km
		Pakka Unplanned Area	2.188 sq km
		Population	24267
		Household	4089
		Settlements	110
Meteorological Drought	Medium - Extreme	Wet area	112
		Agriculture Area	44.507 sq km
		Bare Area with sparse Natural Vegetation	3.33 sq km
		Forest Area	1.018 sq km
		Range Land	1.566 sq km
		Wet area	0.002 sq km
		Population	24483
		Household	4120
Agricultural Drought	Low - Medium	Agriculture Area	14.371 sq km
		Bare Area with sparse Natural Vegetation	1.726 sq km
		Forest Area	1.251 sq km
		Range Land	1.914 sq km
		Population	6566
		Household	1108
		Settlements	41
Riverine Flood	Nil	The UC falls out of vulnerable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	

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

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 filed arm of PEOC for execution and implementation of instructions passed on by PEOC. The center is equipped with modern tools and techniques for management and operation activities in pre, during and post disaster events. The center works under the management of DDMA with 24/7 operation during disasters.

FUNCTION OF DEOC

The functions of DEOC are appended below;

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

SECTOR WISE ROLES AND RESPONSIBILITIES OF GOVERNMENT FUNCTIONARIES

AGRICULTURE AND LIVESTOCK DEPARTMENT

Pre-Disaster

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

During-Disaster

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

Post-Disaster

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

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

PROVINCIAL DISASTER MANAGEMENT AUTHORITY (PDMA)

Pre-Disaster

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

During-Disaster

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

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

Post-Disaster

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

DISTRICT DISASTER MANAGEMENT AUTHORITY (DDMA)

Pre-Disaster

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

During-Disaster

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

Post-Disaster

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

CIVIL DEFENSE

Pre-Disaster

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

During-Disaster

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

Post-Disaster

- Assist in rehabilitation process if required

EDUCATION DEPARTMENT

Pre-Disaster

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

During-Disaster

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

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

Post-Disaster

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

FINANCE DEPARTMENT

Pre-Disaster

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

During-Disaster

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

Post-Disaster

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

HEALTH DEPARTMENT

Pre-Disaster

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

During-Disaster

- Provide emergency treatment for the seriously injured
- Ensure emergency supplies of medicines and first-aid
- Supervise food, water supplies, sanitation and disposal of waste

- Assess and co-ordinate provision of ambulances and hospitals where they could be sent (public and private);
- Provide special information required regarding precautions for epidemics
- Set-up an information Centre to organize sharing of information for public information purposes
- Conduct disaster impact assessment on health
- Intervene in case of disease outbreak
- Medical camps and vaccination
- Ongoing surveillance with regard to health issues and disease outbreaks

Post-Disaster

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

IRRIGATION DEPARTMENT

Pre-Disaster

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

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

During-Disaster

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

Post-Disaster

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

INFORMATION DEPARTMENT

Pre-Disaster

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

- Ensure media coverage and publication of PDMA and DDMA meetings for pre disaster preparations

During-Disaster

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

Post-Disaster

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

PAKISTAN METEOROLOGICAL DEPARTMENT (PMD)

Pre-Disaster

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

During-Disaster

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

Post-Disaster

- Technical assistance in rescue and rehabilitation process

POLICE DEPARTMENT

Pre-Disaster

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

During-Disaster

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

Post-Disaster

- Assist in relief and rehabilitation process

REVENUE DEPARTMENT

Pre-Disaster

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

During-Disaster

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

Post-Disaster

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

ARMED FORCES

Pre-Disaster

- Coordinate with the DDMA in the pre-disaster planning

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

During-Disaster

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

Post-Disaster

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

SOCIAL WELFARE AND COMMUNITY DEVELOPMENT

Pre-Disaster

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

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

During-Disaster

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

Post-Disaster

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

NGOs / INGOs

Pre-Disaster

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

- Resource mobilization at local and international level

During-Disaster

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

Post-Disaster

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

DISASTER MANAGEMENT GUIDELINES

INTRODUCTION

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

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

Riverine Flood	1. River Indus in Sindh can be segmented in three broad reaches Guddu to Sukkur, Sukkur 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 Khairpur 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 level in coordination with irrigation department, the government of

	Punjab, Federal Flood Commission and Pakistan Meteorological Department (PMD) be conducted. 5. Timely alerts be issued to people living in low lying areas within flood plain. 6. In case of high anticipated flows evacuation of people and livestock be carried out. 7. Soaking and compacting of embankments before arrival of flood water. 8. Reinforcement and stone pitching of high-risk embankments. 9. Use alternative eco-friendly options like use of bamboo wood etc. to minimize erosion impact on high-risk embankments. 10. Where necessary and possible, erection of guide embankments and spur before arrival of high flood water. 11. 24/7 vigilance of high-risk embankments by Sindh Irrigation Department. 12. Readily availability of breach filling stock and machinery at high risk embankments. 13. 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. 14. Removal of possible congestion factors within the flood plain. 15. Public participation comprising local people be encouraged in pre and during flood periods.
Earthquake	1. The geology of Sindh is divisible in three main regions, the mountain ranges of Kirthar, Pab containing a chain of minor hills in the west and in east it is covered by the Thar Desert and part of Indian Platform where the main exposure is of Karoonjhar Mountains, which is famous for Nagar Parkar Granite. District Khairpur falls away from any major fault line and is unlikely to be affected by a massive earthquake. 2. Some of prominent faults situated in Sindh are (a) Karachi-Jati, (b) Surjan-Jhimpir, (c) Pab Fault (d) Hub Fault and (e) Allah Bund-Rann of

	Kutch faults. 3. Though risk of geophysical hazards in Khairpur 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 Khairpur 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	1. The district has witnessed rapidly increased severity of heatwave in the past five years. 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	1. Khairpur is a moderately populated district with closely spaced homes in major cities. Climatic condition of the district can be categorized as Hot and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010). Average annual rainfall received during a year across the district is

	127.65 mm. 2. Drought is also forecastable hazard and can be predicted well in advance. Though drought does not bring any prominent or famine like conditions in the district, however, it causes reduction in agricultural production and some extent disturb food supply for the animals and livestock. The best practice to manage drought related impacts is storage of food supplies for both humans and animals. 3. The situation of drought may vary in future due to climate change effects, therefore, introduction of drought resilient crops is need of the time. Additionally, efficient use of available water resources and introduction of efficient irrigation systems in agriculture sector is also required.
Cyclone	According to MHVRA Study 2022, there is no Cyclone Hazard in Khairpur district.
Tsunami	According to MHVRA Study 2022, there is no Tsunami Hazard in Khairpur 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 with in 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 Khairpur 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 (13)	**Agra, Baberloi, Hadal Shah, Jado Wahan, Kamaldero, Khemta, Kot Mir Mohammad, Mori, Pir Hayat Shah, Piryaloi, Ripri, Saderji, Sagyoon**
UCs not at Risk (57)	**Ahmed Pur, Akari, Bapho, Baqi Khan ,Bhango Behan, Bhelaro, Bozdar Wada, Bukhari, Choon Diko, Deparja, Drib Mehar Shah, Fareedabad, Fatehpur, Gadeji, Gambat, Hindiari, Jeskani ,Jhando Mashaik ,Kandiari ,Karundi, Khanpur, Khenwari ,Khuhra, Kolab Jial, , Kot Diji, Kot Jubo, Kot Lalu, Kumb, Layari, Machyoon, Mad, Mandan ,Manghanwari, Mehar Ali, Mohsin Shah, Muhba Wah, Nasir Faqir, Nizamani ,Noorpur, Pacca Chang, Pir Jogoth, Rani Pur Un, Rasoolabad , Razabad ,Sabar Rind, Sami, Setarja, Shadi Shaheed, Sikanderabad, Sobhodero, Sohu, Tajjal, Tando Masti, Tando Mir Ali, Thari , Mirwah, Therhi, Veesar**
General Description	1. Khairpur district is located in north-eastern Sindh and is bounded on the north by Shikarpur and Sukkur, on the east by India, on the south by Sanghar and Shaheed Benazirabad and on the west by Larkana and Naushahro Feroze. 2. District Khairpur has a well-established irrigation system, having Sukkur Barrage as the main source. Agriculture, in Khairpur, mainly depends upon canal irrigation. However, other modes of land irrigation like river water and tube wells are also used. 3. The total population of district according to 2017 census was recorded to be 2,405,523. Majority of the people live in the rural area. 4. Khairpur is also an agro-based district where 42% of the mouzas have reported agriculture sector as the major source of employment. Casual labor is frequent in this district and is a source of employment for 25% of the mouza. Services and personal business are also major sources of employment for some of the population. 5. Khairpur is located on the left bank of River Indus and is prone to severe threat when River Indus is in high flood. 6. It was hit by heavy floods in 2011, 2012 and 2015. 7. The floods of 2011 had devastating effect on the district as 2,075 villages/settlements of 38 union councils in 8 talukas were affected. A population of 384,137 persons was affected and there were 65 casualties and 65 injuries. 29,023 houses were damaged, out of which 17,470 were partially damaged and 11,553 houses were destroyed. 8. In 2012 floods, all 8 Talukas were affected due to rains and floods. 1,448 villages/settlements were affected and a population of 499,000 was affected. 9. Khairpur was one of the worst affected districts of 2015 flood, where floods affected four talukas encompassing 13 union councils — 380 villages — with the population of 157,490. 10. According to MHVRA study 2022, flood hazard intensity for district Khairpur is **"Low to Very High"** 11. According to MHVRA study 2022, flood risk for district Khairpur is **"Low to High"**

Disaster Management Measures
Preparedness
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	1. An earthquake is a sudden shaking of the ground caused by two chunks of earth's crust sliding past one another. 2. Although earthquakes are short-lived, usually not lasting more than a minute, they can leave behind incredible damage. 3. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake. 4. The earthquake hazard intensity for district Khairpur is "**Low**" 5. The earthquake risk intensity for district Khairpur is "**Low**"

Disaster Management Measures

Preparedness

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

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.

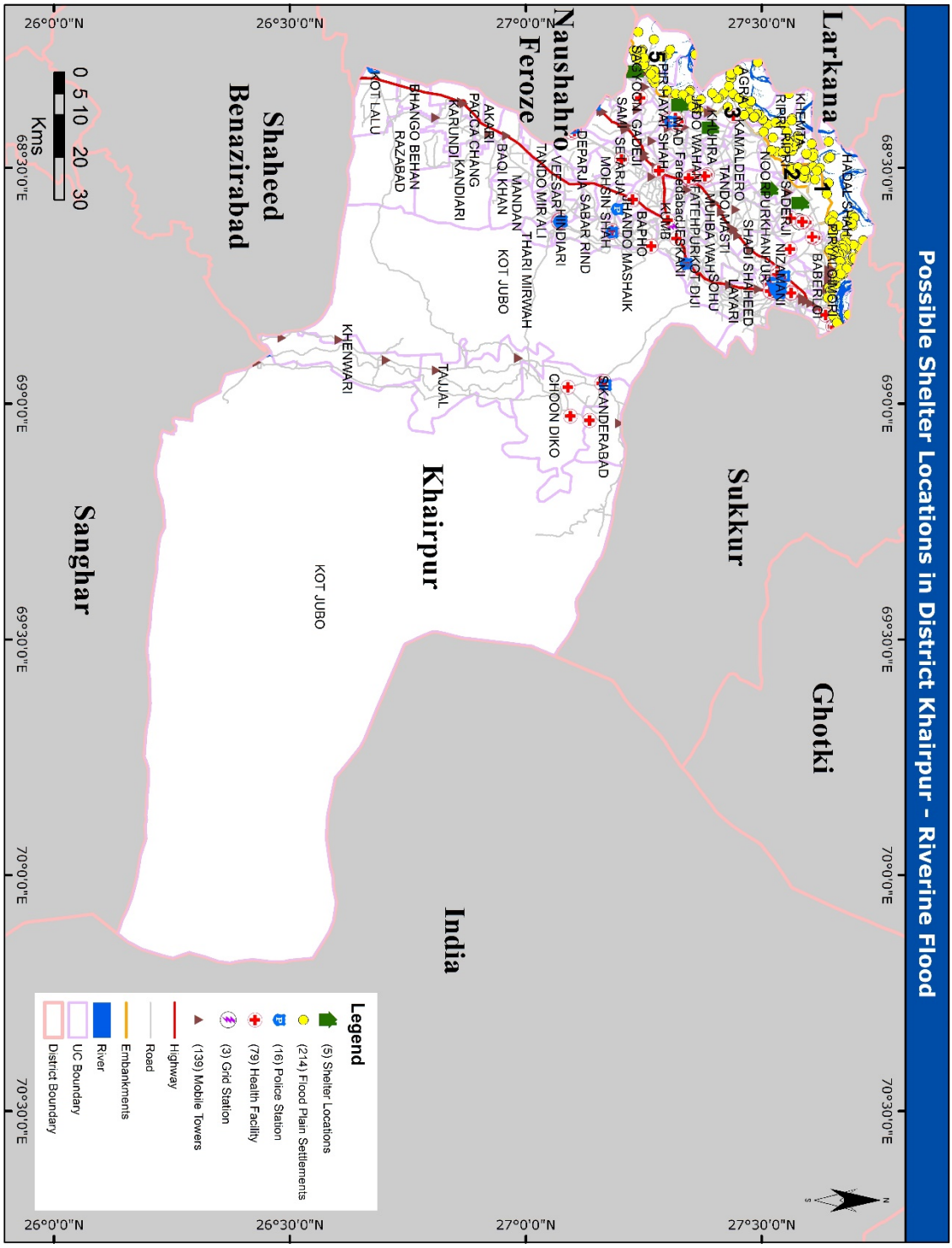
Heatwave	
UCs at Risk	**All UCs**
General Description	1. Heatwave is a condition of atmospheric temperature that leads to physiological stress, which sometimes can claim human life. 2. Khairpur is known for its extremely hot summers. Khairpur has a hot desert climate, characterized by very hot and hazy summers as the temperature can reach **50°C** which creates problem for the individuals like heat stroke, skin burn and sometimes death of a person. 3. Dry heat is experienced starting April to early June until the Monsoon season starts to arrive. Monsoons in Khairpur are not very wet, but bring high dew points, resulting in high heat indices. 4. In 2006, Heatwave claimed four lives in Khairpur while 10 people, including four children, had been hospitalized. 5. A severe heatwave in 2007 gripped Khairpur and its surrounding areas; temperatures soared to **51**°C. 6. According to MHVRA study 2022, heatwave hazard intensity for district Khairpur is "**High to Severe**" 7. According to MHVRA study 2022, heatwave risk for district Khairpur is "**Low to High**"
Disaster Management Measures	
Preparedness	
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	
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	
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 Khairpur district

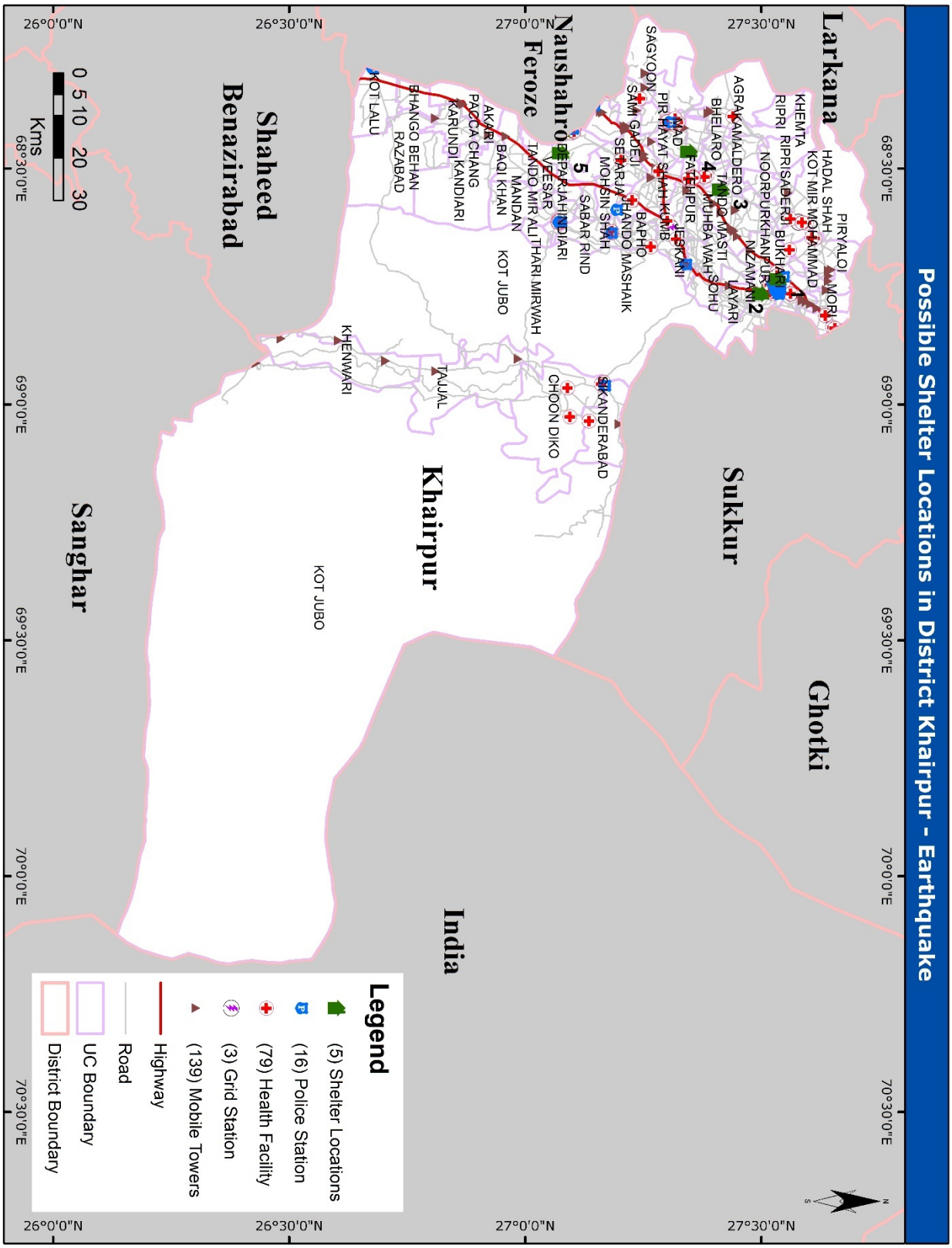
Drought	
UCs at Risk	**All UCs**
General Description	1. Climatic condition of the district can be categorized as Hot and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010) 2. Large area, about 60% of the total district area is covered with bare areas with sparse natural vegetation, Achhro (white desert) lies at eastern side of the district. 3. Range land with natural herbs are mostly situated in upper and central areas of the district. 4. Orchards are abundant in northern areas of the district. Natural vegetation is found along northern boundary on both sides of river bed. 5. Average annual rainfall received during a year across the district is 127.65 mm. 6. Agriculture mainly depends upon canal irrigation system, however, river water and tube-wells are also being used for land irrigation. 7. According to MHVRA study 2022, a. Meteorological drought hazard for district Khairpur is "**Extreme**" b. Meteorological drought risk for district Khairpur is "**Medium to Extreme**" c. Agricultural drought hazard for district Khairpur is "**Mild to Extreme**" d. Agricultural drought risk for district Khairpur is "**Low to Extreme**"
Disaster Management Measures	
Preparedness	
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	
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	
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 Khairpur. 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.	The rainwater harvesting sites should be identified by using geospatial technologies and ancillary data, which can be used as clean water aquifers by communities, which in turn can use it for drinking, and irrigation purposes. Potential rainwater harvesting sites may be identified by using Analytical Hierarchy Process (AHP) and spatial analyst tool, with multiple thematic layers (rain data, population, digital elevation model, soil type, etc.)

COST BENEFIT ANALYSIS

INTRODUCTION

1. Cost Benefit Analysis (CBA) is a key analytical tool that can provide quantitative information regarding the prioritization of risk reduction based on comparing benefits of an actual or planned intervention with its costs.

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 – KHAIRPUR DISTRICT

The existing nature of disasters in Khairpur district can be categorized as low to Extreme. The prominent hazards in the district are drought and flood. The drought risk in the district ranges from low to extreme. There is no risk of storm surge, cyclone and tsunami in the district. The risk of earthquake is determined to be low. As far as heatwave is concerned Khairpur district is at low to high-risk. As far as riverine flood is concerned the settled areas of few 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:

Table9: Cost Benefit Analysis of Disaster Risk Measures in District Khairpur

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 Khairpur, 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 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.	Opening the headworks in the district and downstream areas increases the capacity of flood water storage and reduces 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.
4.	Early warning system for drought	Dissemination of information by meteorological department regarding delays in rainfall season using radio announcements,	Equipping farmers with knowledge of impending low flow in irrigation channels will enable for better crop water management and reduce loss to the crops by as much as possible. This shall

		print and digital media. Warnings to be issued prior to commencing maintenance on headworks and for expected low flow in upstream river and tributaries.	lead to an overall reduction in cases of malnutrition, dehydration, save medical expenses and possible save lives.
5.	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.
6.	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. Awareness regarding efficient irrigation systems (drip and trickle) and its benefits during periods of low water supply. Awareness regarding cultivation of resilient crop that require less water.	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.
7.	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 (214) within flood Plains Prone to Riverine Flood

S.No	Name	Longitude	Latitude	Area (acres)
1	Syed Morial Shah Ji Lantahi	68.500	27.577	11.42
2	Shaikhan Jo Goth	68.294	27.450	9.56
3	Ramay Jo Goth	68.761	27.646	43.36
4	Phullo Goth	68.359	27.477	53.44
5	Mari Goth	68.770	27.645	19.26
6	Kot Mir Mohammad	68.675	27.652	64.71
7	Keti Mir Mohammad Ghumro	68.533	27.641	83.29
8	Karim Bux Unar	68.501	27.623	11.30
9	Goth Yaqub Ali Bhand	68.685	27.651	3.73
10	Goth Wahur	68.264	27.288	6.30
11	Goth Umar Panhawar	68.437	27.524	4.48
12	Goth Ulra Jagi	68.698	27.666	50.27
13	Goth Taj Mohammad Magnejo	68.437	27.578	33.34
14	Goth Syed	68.302	27.265	20.69
15	Goth Sulaiman Kalhoro	68.250	27.306	36.00
16	Goth Sohbat Khokhar	68.213	27.238	4.44
17	Goth Sobho Shar	68.679	27.671	2.03
18	Goth Shaikh	68.702	27.668	50.27
19	Goth Shafi Mohammad Shahani	68.468	27.545	24.36
20	Goth Saleh	68.470	27.594	23.69
21	Goth Sajan Maheser	68.611	27.644	5.00
22	Goth Sadiq	68.477	27.608	9.58
23	Goth Qazi Rahim Dino Khmbhro	68.674	27.644	6.57
24	Goth Qazi Bhutto	68.310	27.274	18.59
25	Goth Qadir Bux Sial	68.327	27.431	20.73
26	Goth Phullo Bandir	68.404	27.529	99.47
27	Goth Pathan	68.370	27.353	8.21
28	Goth Panjal Khan Kalhoro	68.688	27.658	15.26
29	Goth Nurpur	68.346	27.333	6.20
30	Goth Narejo	68.663	27.694	2.69
31	Goth Nangar Ujan	68.525	27.613	21.60
32	Goth Naim Ahmed Kharel	68.425	27.553	80.81
33	Goth Nabi Bux Sial	68.352	27.452	22.00
34	Goth Mumtaz Ali	68.445	27.642	9.54
35	Goth Morghaper	68.555	27.638	86.35
36	Goth Mohammad Sabal Udho	68.713	27.680	15.72
37	Goth Mohammad Lark	68.463	27.520	13.85
38	Goth Mohammad Bux Katper	68.658	27.678	6.00
39	Goth Mohammad Aqil	68.725	27.667	3.01

S.No	Name	Longitude	Latitude	Area (acres)
40	Goth Mohal	68.507	27.617	18.61
41	Goth Miani	68.343	27.318	2.93
42	Goth Merawal Jagirani	68.638	27.650	1.99
43	Goth Mahmud	68.228	27.272	29.00
44	Goth Machi	68.623	27.663	13.64
45	Goth Kumbhar	68.466	27.532	13.42
46	Goth Khanan Narejo	68.393	27.484	-
47	Goth Kando	68.459	27.556	8.58
48	Goth Kalhoro	68.357	27.348	16.72
49	Goth Jawan Shar	68.645	27.677	3.22
50	Goth Jaro Khan Nareja	68.671	27.671	3.88
51	Goth Jadal Udha	68.714	27.667	6.69
52	Goth Imam Bux Shar	68.671	27.678	-
53	Goth Imam Bux Narejo	68.654	27.715	3.62
54	Goth Gulu Sial	68.455	27.567	12.35
55	Goth Gullan Narejo	68.446	27.556	-
56	Goth Ghulam Mohammad	68.424	27.504	17.89
57	Goth Ghulam Husain Khaskheli	68.268	27.234	11.00
58	Goth Garhi Rangole Shah	68.832	27.661	17.85
59	Goth Faqir Amin Kori	68.669	27.656	5.86
60	Goth Faiz Mohammad Phul Poto	68.663	27.670	1.76
61	Goth Dost Mohammad	68.450	27.606	47.10
62	Goth Dosdara	68.520	27.588	-
63	Goth Daria Khan Shaikh	68.616	27.651	3.23
64	Goth Dargah Miandad Faqir	68.678	27.660	12.97
65	Goth Chana	68.336	27.299	19.41
66	Goth Burra	68.260	27.360	7.49
67	Goth Burdi Brochi	68.372	27.428	7.65
68	Goth Bindi	68.295	27.272	-
69	Goth Bilawal Jamro	68.683	27.668	8.05
70	Goth Bhalman	68.356	27.371	46.45
71	Goth Badal Khan Bhangar	68.684	27.663	18.65
72	Goth Arbab Ahmed Shaikh	68.503	27.565	7.95
73	Goth Ansari	68.718	27.672	15.08
74	Goth Ali Mohammad Depar	68.674	27.646	8.27
75	Goth Akbar Khaskheli	68.267	27.250	20.64
76	Goth Abdul Rahman Uner	68.498	27.609	5.24
77	Daro	68.506	27.591	11.34
78	Bani	68.601	27.651	69.58
79	Ashraf Jatoi	68.829	27.659	17.85
80	Ali Dino Shaikh	68.776	27.640	1.90
81	Abdul Hakim Manghejo	68.663	27.655	14.79
82	Untitled Settlement	68.301	27.269	2.34

S.No	Name	Longitude	Latitude	Area (acres)
83	Untitled Settlement	68.303	27.270	3.42
84	Untitled Settlement	68.315	27.272	7.49
85	Untitled Settlement	68.346	27.418	11.44
86	Untitled Settlement	68.342	27.420	27.06
87	Untitled Settlement	68.310	27.435	15.67
88	Untitled Settlement	68.359	27.465	15.93
89	Untitled Settlement	68.367	27.471	14.59
90	Untitled Settlement	68.388	27.482	6.88
91	Untitled Settlement	68.386	27.483	1.79
92	Untitled Settlement	68.393	27.483	9.62
93	Untitled Settlement	68.400	27.504	23.31
94	Untitled Settlement	68.409	27.510	4.25
95	Untitled Settlement	68.408	27.513	26.57
96	Untitled Settlement	68.409	27.548	8.33
97	Untitled Settlement	68.396	27.564	13.40
98	Untitled Settlement	68.509	27.573	16.17
99	Untitled Settlement	68.447	27.575	26.45
100	Untitled Settlement	68.518	27.590	2.94
101	Untitled Settlement	68.522	27.591	4.78
102	Untitled Settlement	68.472	27.595	0.20
103	Untitled Settlement	68.521	27.596	4.31
104	Untitled Settlement	68.501	27.604	1.68
105	Untitled Settlement	68.469	27.609	5.66
106	Untitled Settlement	68.503	27.613	5.15
107	Untitled Settlement	68.747	27.656	3.90
108	Untitled Settlement	68.735	27.657	12.04
109	Untitled Settlement	68.607	27.689	22.21
110	Untitled Settlement	68.601	27.692	4.74
111	Untitled Settlement	68.606	27.696	3.13
112	Untitled Settlement	68.697	27.687	9.91
113	Untitled Settlement	68.694	27.693	4.10
114	Untitled Settlement	68.689	27.694	2.98
115	Untitled Settlement	68.694	27.697	2.96
116	Untitled Settlement	68.672	27.707	25.72
117	Untitled Settlement	68.668	27.707	3.91
118	Untitled Settlement	68.674	27.679	14.29
119	Untitled Settlement	68.669	27.677	8.29
120	Untitled Settlement	68.662	27.679	5.59
121	Untitled Settlement	68.686	27.665	3.91
122	Untitled Settlement	68.678	27.660	12.97
123	Untitled Settlement	68.682	27.656	2.57
124	Untitled Settlement	68.716	27.674	4.78
125	Untitled Settlement	68.720	27.673	8.55

S.No	Name	Longitude	Latitude	Area (acres)
126	Untitled Settlement	68.720	27.664	1.56
127	Untitled Settlement	68.722	27.668	2.50
128	Untitled Settlement	68.726	27.671	3.93
129	Untitled Settlement	68.729	27.666	3.52
130	Untitled Settlement	68.725	27.660	21.02
131	Untitled Settlement	68.731	27.661	17.65
132	Untitled Settlement	68.812	27.684	26.72
133	Untitled Settlement	68.817	27.654	8.52
134	Untitled Settlement	68.821	27.655	6.42
135	Untitled Settlement	68.823	27.657	3.12
136	Untitled Settlement	68.814	27.651	7.09
137	Untitled Settlement	68.754	27.642	1.53
138	Untitled Settlement	68.623	27.693	2.72
139	Untitled Settlement	68.619	27.691	17.98
140	Untitled Settlement	68.611	27.646	2.45
141	Untitled Settlement	68.250	27.247	4.63
142	Untitled Settlement	68.253	27.246	5.28
143	Untitled Settlement	68.255	27.244	4.16
144	Untitled Settlement	68.259	27.233	15.45
145	Untitled Settlement	68.252	27.229	10.99
146	Untitled Settlement	68.270	27.252	10.71
147	Untitled Settlement	68.507	27.594	1.71
148	Untitled Settlement	68.507	27.589	9.01
149	Untitled Settlement	68.506	27.589	0.80
150	Untitled Settlement	68.499	27.563	4.09
151	Untitled Settlement	68.517	27.566	10.76
152	Untitled Settlement	68.433	27.576	0.29
153	Untitled Settlement	68.434	27.577	10.17
154	Untitled Settlement	68.445	27.577	9.25
155	Untitled Settlement	68.444	27.576	2.43
156	Untitled Settlement	68.450	27.575	9.38
157	Untitled Settlement	68.443	27.567	6.51
158	Untitled Settlement	68.453	27.566	3.39
159	Untitled Settlement	68.452	27.571	3.28
160	Untitled Settlement	68.457	27.568	2.77
161	Untitled Settlement	68.458	27.565	10.04
162	Untitled Settlement	68.460	27.565	3.87
163	Untitled Settlement	68.464	27.564	4.27
164	Untitled Settlement	68.461	27.551	5.40
165	Untitled Settlement	68.445	27.557	10.86
166	Untitled Settlement	68.446	27.555	7.51
167	Untitled Settlement	68.467	27.548	2.04
168	Untitled Settlement	68.469	27.548	3.10

S.No	Name	Longitude	Latitude	Area (acres)
169	Untitled Settlement	68.400	27.564	2.82
170	Untitled Settlement	68.398	27.502	4.13
171	Untitled Settlement	68.388	27.495	34.80
172	Untitled Settlement	68.386	27.490	5.25
173	Untitled Settlement	68.384	27.474	74.25
174	Untitled Settlement	68.393	27.485	5.95
175	Untitled Settlement	68.389	27.463	4.15
176	Untitled Settlement	68.365	27.461	4.45
177	Untitled Settlement	68.350	27.445	3.90
178	Untitled Settlement	68.347	27.442	37.02
179	Untitled Settlement	68.343	27.439	14.22
180	Untitled Settlement	68.303	27.437	3.95
181	Untitled Settlement	68.350	27.403	24.74
182	Untitled Settlement	68.353	27.408	13.45
183	Untitled Settlement	68.353	27.405	9.60
184	Untitled Settlement	68.260	27.300	16.93
185	Untitled Settlement	68.377	27.365	3.89
186	Untitled Settlement	68.374	27.359	1.71
187	Untitled Settlement	68.375	27.360	0.47
188	Untitled Settlement	68.373	27.358	5.81
189	Untitled Settlement	68.369	27.354	10.49
190	Untitled Settlement	68.360	27.345	4.05
191	Untitled Settlement	68.336	27.348	15.60
192	Untitled Settlement	68.340	27.346	5.33
193	Untitled settlement	68.351	27.339	10.66
194	Untitled settlement	68.358	27.342	3.04
195	Untitled settlement	68.355	27.333	13.57
196	Untitled settlement	68.297	27.274	11.94
197	Untitled settlement	68.295	27.273	1.94
198	Untitled settlement	68.293	27.270	8.66
199	Untitled settlement	68.296	27.269	1.91
200	Untitled settlement	68.299	27.273	1.62
201	Untitled settlement	68.301	27.274	1.50
202	Untitled settlement	68.292	27.261	10.04
203	Untitled settlement	68.288	27.249	4.96
204	Untitled settlement	68.282	27.250	12.79
205	Untitled settlement	68.312	27.272	1.40
206	Untitled settlement	68.318	27.272	4.89
207	Untitled settlement	68.320	27.273	2.31
208	Untitled settlement	68.313	27.268	4.12
209	Untitled settlement	68.342	27.395	24.99
210	Untitled settlement	68.301	27.435	33.34
211	Untitled settlement	68.344	27.558	23.92

S.No	Name	Longitude	Latitude	Area (acres)
212	Untitled settlement	68.481	27.641	18.13
213	Untitled settlement	68.478	27.645	13.62
214	Untitled settlement	68.277	27.491	11.15

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°35'9.56"N 68°34'39.54"E	76	~3,400	187
	Upper left corner:	27°34'58.92"N 68°34'19.03"E			
	Lower right corner:	27°34'58.28"N 68°34'46.60"E			
	Lower left corner:	27°34'43.84"N 68°34'19.47"E			
2	Upper right corner:	27°31'12.85"N 68°32'46.32"E	33.4	~1,500	175
	Upper left corner:	27°31'2.08"N 68°32'35.17"E			
	Lower right corner:	27°31'4.69"N 68°32'53.65"E			
	Lower left corner:	27°30'55.24"N 68°32'42.96"E			
3	Upper right corner:	27°23'42.96"N 68°24'59.58"E	50	~2,200	172
	Upper left corner:	27°23'36.48"N 68°24'47.80"E			
	Lower right corner:	27°23'26.91"N 68°25'6.56"E			
	Lower left corner:	27°23'21.16"N 68°24'52.51"E			
4	Upper right corner:	27°19'42.15"N 68°21'59.67"E	15.9	~700	172
	Upper left corner:	27°19'39.84"N 68°21'52.69"E			
	Lower right corner:	27°19'32.04"N 68°22'12.45"E			
	Lower left corner:	27°19'30.70"N 68°22'10.39"E			
5	Upper right corner:	27°13'57.71"N 68°17'55.97"E	8.5	~380	165
	Upper left corner:	27°14'0.55"N 68°17'49.95"E			
	Lower right corner:	27°13'51.72"N 68°17'48.29"E			
	Lower left corner:	27°13'53.59"N 68°17'45.29"E			

A total of 5 shelter locations have been selected as Flood shelter places across district Khairpur. 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 8,180 tents (tent with size of 45 sq. m each) can be set up within the demarcated shelter places.

ANNEX – C – SHELTER LOCATIONS DESCRIPTION – EARTHQUAKE

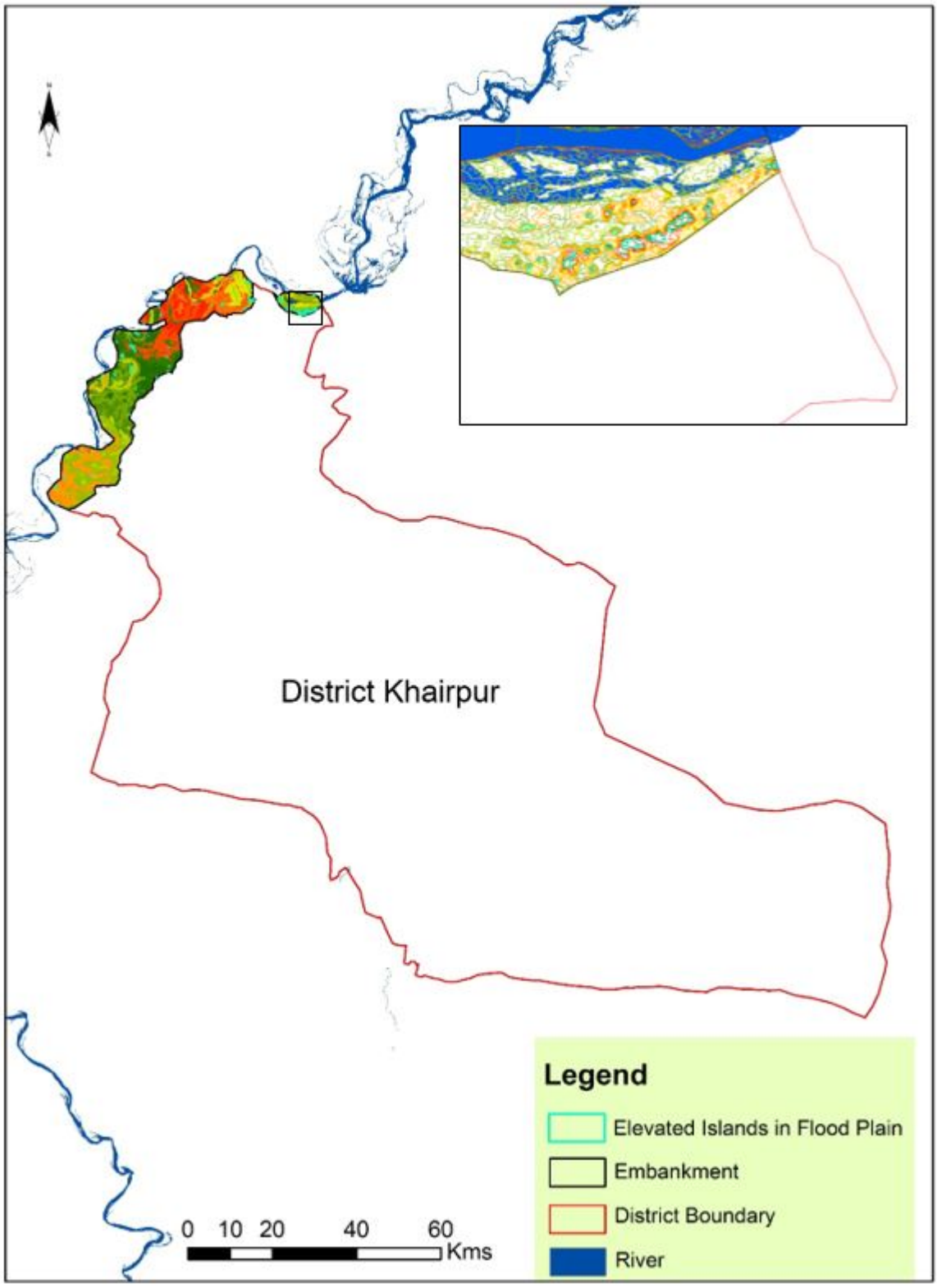
The given shelter locations for earthquake are proposed on the findings of the MHVRA 2022 study and information obtained through satellite technology and online verifiable sources. It is recommended to conduct on ground physical surveys to evaluate their suitability.

Shelter location	Co-ordinates		Area (acres)	Estimated Tents (numbers)	Avg. elevation (ft)
1	Upper right corner:	27°32'12.10"N 68°44'38.96"E	285	~12,000	182
	Upper left corner:	27°32'27.75"N 68°43'50.97"E			
	Lower right corner:	27°31'47.94"N 68°44'24.22"E			
	Lower left corner:	27°32'2.69"N 68°43'37.38"E			
2	Upper right corner:	27°29'55.61"N 68°46'16.54"E	72.5	~3,200	186
	Upper left corner:	27°30'6.12"N 68°45'49.18"E			
	Lower right corner:	27°29'43.96"N 68°46'9.95"E			
	Lower left corner:	27°29'57.99"N 68°45'43.13"E			
3	Upper right corner:	27°24'58.16"N 68°32'56.20"E	31.8	~1,400	171
	Upper left corner:	27°24'51.11"N 68°32'30.37"E			
	Lower right corner:	27°24'54.31"N 68°32'59.98"E			
	Lower left corner:	27°24'45.28"N 68°32'31.26"E			
4	Upper right corner:	27°21'7.00"N 68°27'45.25"E	79.2	~3,500	162
	Upper left corner:	27°21'1.44"N 68°27'36.67"E			
	Lower right corner:	27°20'35.72"N 68°28'14.41"E			
	Lower left corner:	27°20'32.10"N 68°28'7.41"E			
5	Upper right corner:	27° 5'7.67"N 68°28'44.91"E	1,121	~50,000	165
	Upper left corner:	27° 4'55.97"N 68°27'17.33"E			
	Lower right corner:	27° 4'2.78"N 68°28'53.89"E			
	Lower left corner:	27° 3'57.82"N 68°27'31.87"E			

A total of 5 shelter locations have been selected as Earthquake shelter places across district Khairpur. 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 70,100 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 KHAIRPUR

Total 78 elevated islands have been identified within the embankments in district Khairpur, with a cumulative area of approximately 409.11 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 Khairpur 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.