MHVRA INFORMED DISASTER MANAGEMENT PLAN 2023-2032

DISTRICT KARACHI CENTRAL



DEVELOPED BY PDMA SINDH







WITH THE SUPPORT OF



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PREFACE

Multi-Hazard Vulnerability Risk Assessment (MHVRA) and resultant database are the foundation for evidence-based disaster management plan. Such databases are also an integral part of the implementation of disaster risk reduction and disaster risk management strategies. The MHVRA study of the Karachi Central 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 Karachi Central is prepared and being presented to disaster management practitioners, executors, and prominent stakeholders. Before the MHVRA study, the district-level disaster and contingency plans were prepared using conventional methods and human knowledge. In contrast, the MHVRA based disaster management plans are realistic, based on modern techniques and multiple data sources, therefore, are more authentic and reliable for planning and management of disasters in the district.

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

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

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

ACKNOWLEDGEMENTS

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

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

- - Disclaimer - -

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



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INTRODUCTION TO DISASTER MANAGEMENT PLAN OF DISTRICT KARACHI CENTRAL

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;

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		
Representatives from Business Committee	Member		
Representatives from Chamber of Agriculture	Member		
Any other member as deemed appropriate (need basis)	Member		

Table 1: Recommended Committee for Reviewing Disaster Management Plan

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 KARACHI CENTRAL

DISTRICT KARACHI CENTRAL AT A GLANCE



GEOGRAPHY							
District area in Sq. Km	64	64					
Coordinates	Longitude 67° 1' 1"	to 67° 5' 37" East					
	Latitude 24º 53' 21'	' to 25º 0' 38" North					
Surrounding Districts	Karachi East in East						
	Karachi West in We	est					
Climate Conditions	Warm and Semi-Ari	d					
Coldest Month	January	January					
Hottest Month	Мау						
Seasonal Temperatures	Max Mean (°C)	Min Mean (°C)					
Spring (March and April)	33.51	21.13					
Dry Summer (May and June)	36.50	26.80					
Wet Summer (July to September)	33.75	26.17					
Autumn (October to November)	32.74	21.20					
Winter (December to February)	26.29	14.83					
Average Rainfall	194.77 mm/year	I					
Physiographic Features		-					

DEMOGRAPHY

	Year-1998	Year-2017
Population	2,289,071	2,971,382
Urban	2,289,071	2,971,382
Rural	-	-
No. of Household	-	539,127
Average Annual Growth Rate 1998-2017	1.38 %	

ECONOMY					
Industries	Food products and Beverages, Chemical and Chemical Products and Textile				
Agriculture	Negligible				

ADMINISTRATIVE SYSTEM						
TALUKA NAMES	UC NAMES					
 Gulberg Liaquatabad Nazimabad New Karachi North Nazimabad 	 Abbasi Shaheed Abu Zar Ghaffari Aisha Manzil Ancholi Azizabad Bandhani Colony Buffar Zone 1 Buffar Zone 2 Commercial Area Dak Khana Faisal Farooq-E-Azam Fatima Jinnah Colony Godhra Gulshan Said Tatiwa Jinnah Colony Kalyan Kalyan Kalyan Kalyan Kalyan Kalyan Kalyan Kalyan Khawaja Ajmer Mazimabad No 1 Nusrat Bhutto Colony Sakhi Hassan Rizvia Society Sakhi Hassan Shafia Mill Colony Sakhi Hassan Si Syed Surgi Syed Super Market 					
	42. Yaseenabad					



KARACHI CENTRAL DISTRICT MULTI-HAZARD RISK PROFILES

Vaseenahad	Water Pump	Super Market	u ayeu	Sir Sved	Sharif Abad	Shah Nawaz Bhutto	Shafiq Mill Colony	Shadman	Sakhi Hassan	Rizvia Society	Qasimabad	Paposh Nagar	Pahar Gang	INUST AL DULLO COLOTIY		Nazimabad No 1	Naseerabad	Mustafa Colony	Mujahid Colony	Madina Colony	Khawaja Ajmer	Khandu Goth
100	100		100	100	100	100	100	100	100	100	100	DDT		100	100	100	100	100	100	100	100	100
91	8		58	83	77	9	88	75	87	86	8	g	2	88	8	82	85	2 83	64	8	86	85
ω	5	44	=	6	18	10	ω	7	ω	13	10	11	ų	ø	7	24	00	6	26	6	10	7
96	94		93	90	91	90	94	82	93	90	94	83	3	94	88	92	91	90	92	93	94	92

UC WISE RISK PROFILE

	Α	bbasi Shaheed			
Hazard Type	Risk	Elements of	at Risk		
		Pakka Planned Area	0.731 sq km		
		Pakka Unplanned Area	0.063 sq km		
		Bridges	1		
		Bus Stops	4		
		Education Facilities	15		
		Health Facilities	3		
		Mobile Towers	2		
Еатпалаке	LOW	Petrol Pumps	3		
		Police Stations	1		
		Post Offices	2		
		Welfare Trust	3		
		Road Network	7.328 km		
		Population	60015		
		Household	11035		
	·				
	Low	Pakka Planned Area	0.186 sq km		
		Pakka Unplanned Area	0.014 sq km		
		Road Network	0.71 km		
		Bridges	1		
Cyclone		Education Facilities	1		
		Health Facilities	1		
		Petrol Pumps	1		
		Population	15515		
		Household	2855		
	·		·		
		Pakka Planned Area	0.722 sq km		
Homburguro	Madium Eutroma	Pakka Unplanned Area	0.063 sq km		
neatwave	Medium - Extreme	Population	59356		
		Household	10913		
Meteorological	AA a alium	Population	60427		
Drought	Medium	Household	11110		
	·				
Riverine Flood	Nil	The UC is not prone to flood h However, Orangi Nala passe potential to produce flooding rains. In case of excessive overtopping / breaching and flooding cannot be ruled out fo	nazard due to Indus River. s through the UC and has during monsoon / heavy water in Orangi Nala, consequent residual risk of or UC.		
		-			
Tsunami	Nil	The UC falls out of vulnerable	zone for Tsunami		

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

Abu Zar Ghaffari							
Hazard Type	Risk	Elements at Ri	sk				
		Pakka Planned Area	0.692 sq km				
		Pakka Unplanned Area	0.04 sq km				
		Bus Stops	1				
		Education Facilities	10				
		Fire Stations	1				
		Health Facilities	2				
		Mobile Towers	7				
Earthquake	Low	Petrol Pumps	1				
		Police Stations	1				
		Post Offices	1				
		Welfare Trust	1				
		Irrigation and Drainage Network	1.686 km				
		Road Network	4.339 km				
		Population	47586				
		Household	8149				
		<u>.</u>					
		Pakka Planned Area	0.077 sq km				
		Pakka Unplanned Area	0.013 sq km				
		Irrigation and Drainage Network	0.062 km				
		Road Network	0.266 km				
Cyclone	Low	Education Facilities	2				
		Health Facilities	1				
		Mobile Towers	2				
		Population	6275				
		Household	1076				
		·					
		Pakka Planned Area	0.687 sq km				
Hanturaya		Pakka Unplanned Area	0.04 sq km				
neatwave	Mealum - Extreme	Population	47217				
		Household	8086				
Meteorological		Population	47866				
Drought	Mealum	Household	8197				
		· ·					
		The UC is not prone to flood haze	ard due to Indus River.				
Riverine Flood	Nil	However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy					

		rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
	·	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
	·	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Aisha Manzil				
Hazard Type Risk Elements at		Elements at Ri	sk	
		Pakka Planned Area	1.891 sq km	
		Pakka Unplanned Area	0.364 sq km	
		Bridges	1	
		Bus Stops	1	
		Education Facilities	28	
		Health Facilities	1	
		Mobile Towers	10	
Earthquake	Low	Petrol Pumps	8	
		Post Offices	1	
		Welfare Trust	1	
		Irrigation and Drainage Network	0.063 km	
		Railway Line	0.047 km	
		Road Network	22.327 km	
		Population	136813	
		Household	26289	
			·	
		Pakka Planned Area	0.097 sq km	
		Pakka Unplanned Area	0.042 sq km	
		Irrigation and Drainage Network	0.007 km	
Cyclone	Low	Road Network	0.501 km	
		Education Facilities	8	
		Population	9388	
		Household	1797	
		Pakka Planned Area	1.882 sq km	
Hantumua		Pakka Unplanned Area	0.363 sq km	
Heatwave	mealum - Extreme	Population	136201	
		Household	26175	
Meteorological	AA a alturna	Population	137226	
Drought	Medium	Household	26369	

Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Ancholi					
Hazard Type	Risk	Elements at Risk			
		Pakka Planned Area	1.607 sq km		
		Pakka Unplanned Area	0.098 sq km		
		Bridges	1		
		Bus Stops	1		
		Education Facilities	18		
		Health Facilities	1		
E authouse les	Law	Mobile Towers	1		
Еанициаке	LOW	Petrol Pumps	4		
		Post Offices	1		
		Welfare Trust	1		
		Irrigation and Drainage Network	1.888 km		
		Road Network	15.136 km		
		Population	91348		
		Household	17642		
	Low	Pakka Planned Area	0.079 sq km		
		Pakka Unplanned Area	0.016 sq km		
		Irrigation and Drainage Network	0.205 km		
Cyclone		Road Network	0.595 km		
		Education Facilities	4		
		Population	4770		
		Household	921		
		Pakka Planned Area	1.601 sq km		
Hoghuaya	Medium	Pakka Unplanned Area	0.097 sq km		
neatwave		Population	90978		
		Household	17570		

Meteorological		Population	91616	
Drought	Medium	Household	17693	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.		
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami		
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge		
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought		

Azizabad				
Hazard Type Risk Elements at Risk				
		Pakka Planned Area	1.141 sq km	
		Pakka Unplanned Area	0.38 sq km	
		Bridges	2	
		Bus Stops	1	
		Education Facilities	29	
		Grid Stations	1	
Earthquake	Low	Health Facilities	1	
		Mobile Towers	3	
		Petrol Pumps	1	
		Irrigation and Drainage Network	0.166 km	
		Road Network	13.933 km	
		Population	68625	
		Household	13252	
	·			
		Pakka Planned Area	0.084 sq km	
		Pakka Unplanned Area	0.011 sq km	
Cyclone	Low	Road Network	0.854 km	
		Population	4883	
		Household	944	
		Pakka Planned Area	1.137 sq km	
		Pakka Unplanned Area	0.379 sq km	
Heatwave	Medium - Extreme	Population	68423	
		Household	13212	

Meteorological		Population	68829	
Drought	Medium	Household	13291	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Liyari river, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.		
	1			
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami		
Storm Surge	Nil	The UC falls out of vulnerable zone	e for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought		

Bandhani Colony				
Hazard Type	Hazard Type Risk Elements at Risk			
	-			
		Pakka Planned Area	0.431 sq km	
		Pakka Unplanned Area	0.144 sq km	
		Bridges	2	
		Education Facilities	15	
Farthewalto	Low	Mobile Towers	4	
саппроаке	LOW	Petrol Pumps	2	
		Railway Line	0.13 km	
		Road Network	4.116 km	
		Population	59111	
		Household	11186	
	Low	Pakka Planned Area	0.081 sq km	
		Pakka Unplanned Area	0.017 sq km	
		Road Network	0.344 km	
Cyclone		Education Facilities	2	
		Petrol Pumps	1	
		Population	10166	
		Household	1925	
		Pakka Planned Area	0.428 sq km	
He arts areas		Pakka Unplanned Area	0.144 sq km	
neatwave	wealum - Extreme	Population	58760	
		Household	11120	

Meteorological		Population	59311
Drought	Medium	Household	11225
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	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural	
		Drought	

Buffar Zone 1				
Hazard Type	Hazard Type Risk Elements at Risk			
		Kachcha Area	0.003 sq km	
		Pakka Planned Area	0.763 sq km	
		Pakka Unplanned Area	0.109 sq km	
		Bridges	5	
		Bus Stops	1	
		Education Facilities	9	
Easthaualto	law	Mobile Towers	12	
Earnquake	LOW	Petrol Pumps	2	
		Post Offices	1	
		Welfare Trust	1	
		Irrigation and Drainage Network	2.851 km	
		Road Network	5.042 km	
		Population	42120	
		Household	7541	
		Kachcha Area	0.003 sq km	
		Pakka Planned Area	0.058 sq km	
		Pakka Unplanned Area	0.023 sq km	
		Irrigation and Drainage Network	0.214 km	
Cyclone	Low	Road Network	0.073 km	
		Education Facilities	1	
		Mobile Towers	2	
		Population	4146	
		Household	741	
		Kachcha Area	0.003 sq km	
Heatwave	Medium - Extreme	Pakka Planned Area	0.761 sq km	
		Pakka Unplanned Area	0.108 sq km	

		Population	41934
		Household	7507
Meteorological		Population	42429
Drought	Medium	Household	7596
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
	-		
Storm Surge	Nil	The UC falls out of vulnera	ible zone for Storm Surge
Agricultural Drought	Nil	The UC falls out of vulnera Drought	ble zone for Agricultural

Buffar Zone 2				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	1.061 sq km	
		Pakka Unplanned Area	0.301 sq km	
		Bridges	1	
		Education Facilities	3	
		Mobile Towers	10	
Earthauake	Low	Petrol Pumps	3	
		Post Offices	1	
		Irrigation and Drainage Network	0.343 km	
		Road Network	6.723 km	
		Population	67392	
		Household	12064	
		Pakka Planned Area	0.09 sq km	
		Pakka Unplanned Area	0.009 sq km	
Cyclone	Low	Road Network	0.186 km	
		Population	4939	
		Household	883	
Heatwave	Medium - Extreme	Pakka Planned Area	1.059 sq km	

		Pakka Unplanned Area	0.301 sq km
		Population	67228
		Household	12034
	·	·	
Meteorological	AA a alium	Population	67638
Drought	Medium	Household	12108
	·	·	
Riverine Flood	Nil	The UC is not prone to flo However, Gujjar Nala po potential to produce floo rains. In case of exces overtopping / breaching of flooding cannot be ruled of	bod hazard due to Indus River. asses through the UC and has ding during monsoon / heavy sive water in Gujjar Nala, and consequent residual risk of but for UC.
Tsunami	Nil	The UC falls out of vulnero	able zone for Tsunami
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerc Drought	able zone for Agricultural

		Commercial Area	
Hazard Type	Risk	Elements at Risk	
		Pakka Planned Area	0.681 sq km
		Pakka Unplanned Area	0.049 sq km
		Bridges	1
		Bus Stops	1
		Education Facilities	12
		Grid Stations	1
		Mobile Towers	6
Earthquake	Low	Petrol Pumps	1
		Police Stations	1
		Post Offices	2
		Welfare Trust	1
		Railway Line	0.07 km
		Road Network	4.033 km
		Population	75328
		Household	14255
	·		· ·
		Pakka Planned Area	0.093 sq km
		Pakka Unplanned Area	0.009 sq km
Cyclone	Low	Road Network	0.498 km
		Bus Stops	1
		Police Stations	1

		Post Offices	1
		Population	10617
		Household	2009
		·	
		Pakka Planned Area	0.676 sq km
Homburgurg	Madium Eutroma	Pakka Unplanned Area	0.048 sq km
neatwave	Medium - Extreme	Population	74811
		Household	14158
	-		
Meteorological		Population	75674
Drought	Medium	Household	14320
		·	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Dak Khana					
Hazard Type	Risk	Elements at Risk			
		Pakka Planned Area	0.406 sq km		
		Pakka Unplanned Area	0.147 sq km		
		Bridges	2		
		Bus Stops	2		
Earthquake	Low	Education Facilities	22		
		Mobile Towers	1		
		Road Network	4.572 km		
		Population	58169		
		Household	11006		
			•		
		Pakka Planned Area	0.06 sq km		
Cyclone	Low	Pakka Unplanned Area	0.055 sq km		
		Road Network	0.455 km		
		Education Facilities	7		
		Population	12173		
		Household	2305		

		Pakka Planned Area	0.401 sq km
U		Pakka Unplanned Area	0.147 sq km
Heatwave	Medium - Exfreme	Population	57674
		Household	10915
			-
Meteorological		Population	58562
Drought	Medium	Household	11082
			-
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Liyari river, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulner Drought	able zone for Agricultural

		Faisal	
Hazard Type	Risk	Elements at Risk	
		·	
		Pakka Planned Area	1.113 sq km
		Pakka Unplanned Area	0.018 sq km
		Bus Stops	2
		Education Facilities	16
		Health Facilities	2
Earthquake		Mobile Towers	10
	Low	Petrol Pumps	1
		Post Offices	2
		Welfare Trust	2
		Irrigation and Drainage Network	2.404 km
		Road Network	8.096 km
		Population	77165
		Household	13211
		Pakka Planned Area	0.107 sq km
		Pakka Unplanned Area	0.005 sq km
Cyclone	Low	Irrigation and Drainage Network	0.362 km
		Road Network	0.597 km

		Health Facilities	1
		Mobile Towers	2
		Population	7735
		Household	1324
		Pakka Planned Area	1.105 sq km
Hortumuo	Medium Eutromo	Pakka Unplanned Area	0.018 sq km
neatwave	Medium - Extreme	Population	76544
		Household	13106
Meteorological	AA a dium	Population	77900
Drought	Medium	Household	13338
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	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Farooq-e-Azam				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	1.805 sq km	
		Bridges	1	
		Bus Stops	2	
		Education Facilities	19	
		Health Facilities	3	
Earthquake	Low	Mobile Towers	6	
		Petrol Pumps	2	
		Post Offices	1	
		Road Network	15.663 km	
		Population	89256	
		Household	15973	
		Pakka Planned Area	0.273 sq km	
		Road Network	2.019 km	
Cyclone	Low	Education Facilities	6	
		Population	13511	
		Household	2416	
Heatwave	Medium	Pakka Planned Area	1.78 <mark>8</mark> sq km	

		Population	88406	
		Household	15825	
Meteorological		Population	89617	
Drought	Medium	Household	16040	
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		
		·		
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought		

Hazard Type Risk Elements at Risk Image: Pakka Planned Area 0.81 sq km Pakka Unplanned Area 0.06 sq km Bridges 2 Education Facilities 15 Mobile Towers 10 Petrol Pumps 4 Post Offices 1 Irrigation and Drainage Network 0.937 km Road Network 2.88 km Population 40641 Household 7268 Image: Pakka Unplanned Area 0.01 sq km Image: Pakka Unplanned Area 0.048 sq km Pakka Unplanned Area 0.01 sq km Irrigation and Drainage Network 0.063 km Image: Pakka Unplanned Area 0.01 sq km	Fatima Jinnah Colony					
Earthquake Low Pakka Planned Area 0.81 sq km Pakka Unplanned Area 0.06 sq km Bridges 2 Education Facilities 15 Mobile Towers 10 Petrol Pumps 4 Post Offices 1 Irrigation and Drainage Network 0.937 km Road Network 2.88 km Population 40641 Household 7268 Pakka Planned Area Versork 0.01 sq km Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2	Hazard Type Risk Elements at Risk					
Pakka Planned Area0.81 sq kmPakka Unplanned Area0.06 sq kmBridges2Education Facilities15Mobile Towers10Petrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmImage: Network0.063 kmImage: Network0.063 kmImage: Network0.148 kmMobile Towers2		·				
EarthquakePakka Unplanned Area0.06 sq kmBridges2Education Facilities15Mobile Towers10Petrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmImage: Network1Road Network2Image: Network0.01 sq kmImage: Network0.063 kmImage: Network0.148 kmMobile Towers2	q km	Pakka Planned Area				
Bridges2Education Facilities15Mobile Towers10Petrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmIrrigation and Drainage 0.01 sq kmDetwork2	q km	Pakka Unplanned Area				
EarthquakeLowEducation Facilities15Mobile Towers10Petrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmLowIrrigation and Drainage Network0.0148 kmAdd Network0.148 kmMobile Towers2		Bridges				
EarthquakeLowMobile Towers10Petrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmLowIrrigation and Drainage Network0.063 kmKoad Network0.148 kmMobile Towers2		Education Facilities				
EarthquakeLowPetrol Pumps4Post Offices1Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmIrrigation and Drainage Network0.063 kmLowRoad Network0.148 kmMobile Towers2		Mobile Towers				
Post Offices 1 Irrigation and Drainage 0.937 km Road Network 2.88 km Population 40641 Household 7268 Pakka Planned Area 0.048 sq km Pakka Unplanned Area 0.01 sq km Irrigation and Drainage 0.063 km Road Network 0.148 km Mobile Towers 2		Petrol Pumps	Low	Earthauake		
Irrigation and Drainage Network0.937 kmRoad Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmLowRoad Network0.148 kmMobile Towers2		Post Offices				
Road Network2.88 kmPopulation40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmRoad Network0.148 kmMobile Towers2	km	Irrigation and Drainage Network				
Population40641Household7268Pakka Planned Area0.048 sq kmPakka Unplanned Area0.01 sq kmIrrigation and Drainage Network0.063 kmRoad Network0.148 kmMobile Towers2	m	Road Network				
Household 7268 Pakka Planned Area 0.048 sq km Pakka Unplanned Area 0.01 sq km Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2		Population				
Cyclone Pakka Planned Area 0.048 sq km Pakka Unplanned Area 0.01 sq km Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2		Household				
Cyclone Low Pakka Planned Area 0.048 sq km Pakka Unplanned Area 0.01 sq km Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2						
Pakka Unplanned Area 0.01 sq km Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2	sq km	Pakka Planned Area	Low			
Cyclone Low Irrigation and Drainage Network 0.063 km Road Network 0.148 km Mobile Towers 2	q km	Pakka Unplanned Area				
Cyclone Low Road Network 0.148 km Mobile Towers 2	km	Irrigation and Drainage Network				
Mobile Towers 2	km	Road Network		Cyclone		
		Mobile Towers				
Population 2879		Population				
Household 515		Household				
Pakka Planned Area 0.806 sq km	sq km	Pakka Planned Area				
Pakka Unplanned Area 0.06 sq km	q km	Pakka Unplanned Area		Hoghwayo		
Population 40437		Population				
Household 7233		Household				

Meteorological		Population	40872	
Drought	Medium	Household	7310	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.		
	-			
Tsunami	Nil	The UC falls out of vulnero	ible zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulner	ible zone for Storm Surge	
		·		
Agricultural Drought	Nil	The UC falls out of vulnero Drought	ible zone for Agricultural	

Firdous Colony				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.286 sq km	
		Pakka Unplanned Area	0.476 sq km	
		Bridges	4	
		Education Facilities	13	
		Mobile Towers	4	
Earthauake	Low	Petrol Pumps	1	
		Post Offices	1	
		Irrigation and Drainage Network	1.14 km	
		Road Network	4.37 km	
		Population	60061	
		Household	11046	
		Pakka Planned Area	0.063 sq km	
		Pakka Unplanned Area	0.096 sq km	
		Irrigation and Drainage Network	0.145 km	
Cyclone	Low	Road Network	0.743 km	
		Mobile Towers	2	
		Population	12709	
		Household	2337	
		Pakka Planned Area	0.284 sq km	
Hogtwayo	Madium Extrama	Pakka Unplanned Area	0.472 sq km	
neurwave	Medium - Exfreme	Population	59550	
		Household	10952	

Meteorological	AA a aliuma	Population	60294	
Drought	Medium	Household	11089	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.		
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulner	able zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulner Drought	able zone for Agricultural	

		Godhra	
Hazard Type	Risk	Elements at Risk	
			1.500
		Pakka Planned Area	1.588 sq km
		Pakka Unplanned Area	0.091 sq km
		Bus Stops	2
		Education Facilities	18
		Health Facilities	2
		Industries	11
		Mobile Towers	4
Earthquake	Low	Petrol Pumps	2
		Post Offices	2
		Welfare Trust	1
		Irrigation and Drainage Network	3.304 km
		Road Network	8.505 km
		Population	85887
		Household	14719
		Pakka Planned Area	0.064 sq km
		Pakka Unplanned Area	0.02 sq km
		Irrigation and Drainage Network	0.356 km
Cyclone	Low	Road Network	0.163 km
-,		Bus Stops	1
		Mobile Towers	1
		Post Offices	1
		Population	5474

		Household	939
		Pakka Planned Area	1.583 sq km
He who was a	Madium Entrance	Pakka Unplanned Area	0.087 sq km
Πεατώανε	Medium - Extreme	Population	85393
		Household	14633
Meteorological	AA a dium	Population	86239
Drought	Medium	Household	14779
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River and Gujjar Nala passes through the UC and have potential to produce flooding during monsoon / heavy rains. In case of excessive water in both the channels, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC	
	1	1	
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami
	T	Γ	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
	1		
Agricultural Drought	Nil	The UC falls out of vulner Drought	able zone for Agricultural

Gulshan Said				
Hazard Type	Risk	Elements at Risk		
	·			
		Pakka Planned Area	0.868 sq km	
		Pakka Unplanned Area	0.005 sq km	
		Bus Stops	2	
		Education Facilities	21	
Earthauake	Low	Mobile Towers	1	
		Irrigation and Drainage Network	2.793 km	
		Road Network	4.648 km	
		Population	60314	
		Household	10325	
		Pakka Planned Area	0.054 sq km	
		Pakka Unplanned Area	0 sq km	
		Irrigation and Drainage Network	0.09 km	
Cyclone	Low	Road Network	0.15 km	
		Education Facilities	1	
		Population	3849	
		Household	660	

		Pakka Planned Area	0.858 sq km	
Hanturava		Pakka Unplanned Area	0.005 sq km	
neatwave	Medium	Population	59643	
		Household	10212	
	-			
Meteorological	Medium	Population	60505	
Drought		Household	10359	
	-			
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		
Agricultural Drought	Nil	The UC falls out of vulner	The UC falls out of vulnerable zone for Agricultural	
righteneral Broogh		Drought		

Hakim Ahsun				
Hazard Type	Risk	Eleme	ents at Risk	
		Pakka Planned Area	0.64 sq km	
		Pakka Unplanned Area	0.024 sq km	
		Ambulance Services	1	
		Bus Stops	1	
		Education Facilities	7	
		Health Facilities	2	
Earthquake	Low	Mobile Towers	7	
		Petrol Pumps	1	
		Irrigation and Drainage Network	2.31 km	
		Road Network	4.581 km	
		Population	45048	
		Household	7713	
		Pakka Planned Area	0.059 sq km	
		Pakka Unplanned Area	0.009 sq km	
		Irrigation and Drainage Network	0.224 km	
Cyclone	Low	Road Network	0.328 km	
,		Education Facilities	1	
		Mobile Towers	1	
		Population	4623	
		Household	792	

		Pakka Planned Area	0.636 sq km
Homburguro		Pakka Unplanned Area	0.023 sq km
neatwave	Medium - Extreme	Population	44735
		Household	7660
			·
Meteorological		Population	45410
Drought	Medium	Household	7775
			·
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	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

	Hyderi				
Hazard Type	Risk	Elements at Risk			
	·	·			
		Pakka Planned Area	2.195 sq km		
		Pakka Unplanned Area	0.253 sq km		
		Bus Stops	3		
		Education Facilities	16		
		Health Facilities	2		
		Mobile Towers	5		
Earthauake	Low	Police Stations	1		
		Post Offices	4		
		Welfare Trust	1		
		Irrigation and Drainage Network	1.93 km		
		Road Network	20.618 km		
		Population	115446		
		Household	20671		
		Pakka Planned Area	0.237 sq km		
		Pakka Unplanned Area	0.021 sq km		
		Irrigation and Drainage Network	0.257 km		
		Road Network	1.329 km		
Cyclone	Low	Education Facilities	1		
		Mobile Towers	1		
		Post Offices	1		
		Population	12756		
		Household	2283		

		Pakka Planned Area	2.184 sq km
U		Pakka Unplanned Area	0.251 sq km
Heatwave	Medium - Exfreme	Population	114863
		Household	20567
Meteorological	AA o oliumo	Population	115926
Drought	Medium	Household	20758
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus Rive However, Gujjar Nala passes through the UC and ha potential to produce flooding during monsoon / heav rains. In case of excessive water in Gujjar Nala overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
	1		
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Kalyana				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.973 sq km	
		Pakka Unplanned Area	0.329 sq km	
		Education Facilities	6	
		Health Facilities	1	
		Mobile Towers	4	
Earthquake	LOW	Petrol Pumps	1	
		Welfare Trust	2	
		Road Network	5.904 km	
		Population	67487	
		Household	11868	
	·	·		
	Low	Pakka Planned Area	0.081 sq km	
		Pakka Unplanned Area	0.024 sq km	
Cyclone		Road Network	0.501 km	
		Population	6001	
		Household	1051	
		·	•	
Hoghuana		Pakka Planned Area	0.966 sq km	
neatwave	meaium - Extreme	Pakka Unplanned Area	0.33 sq km	

		Population	67145
		Household	11808
	-		
Meteorological		Population	68015
Drought	Mealum	Household	11962
	-		
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	
		·	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Karimabad				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.63 sq km	
		Bus Stops	2	
		Education Facilities	3	
Farthauako	low	Mobile Towers	5	
Earniquake	LOW	Welfare Trust	2	
		Road Network	7.346 km	
		Population	32891	
		Household	6353	
	Low	Pakka Planned Area	0.054 sq km	
		Road Network	0.401 km	
Cyclone		Education Facilities	1	
		Population	2750	
		Household	532	
		Pakka Planned Area	0.627 sq km	
Heatwave	Medium - Extreme	Population	32728	
		Household	6321	
Meteorological	Medium	Population	33078	
Drought	Medium	Household	6388	
Riverine Flood	Nil	The UC falls out of vulne	erable zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulne	erable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge		
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Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought		

Khamiso Goth			
Hazard Type	Risk	Eleme	ents at Risk
		Pakka Planned Area	0.992 sq km
		Pakka Unplanned Area	0.808 sq km
		Bus Stops	1
		Education Facilities	18
		Health Facilities	1
Earthquake	Low	Mobile Towers	10
		Irrigation and Drainage Network	0.714 km
		Road Network	9.332 km
		Population	91922
		Household	1 <i>5</i> 737
	Pakka Planned Area	0.069 sq km	
		Pakka Unplanned Area	0.049 sq km
Cyclens	1	Road Network	0.13 km
Cyclone	LOW	Pakka Planned Area Pakka Unplanned Area Bus Stops Education Facilities Health Facilities Mobile Towers Irrigation and Drainage Network Road Network Population Household Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Road Network Education Facilities Population Household Household Population Household Population Household Population Household Population Household Population Household The UC is not prone to fle However, Liyari River por potential to produce floc rains. In case of exce overtopping / breaching	4
	Ρομ	Population	7543
		Household	1294
		Pakka Planned Area	0.987 sq km
Heatwaye	Madium Extrama	Pakka Unplanned Area	0.802 sq km
ileulwuve	Medioin - Extreme	Population	91319
		Household	15635
Meteorological	Medium	Population	92397
Drought	Medioin	Household	15818
		Settlements	2
Agricultural Drought	Low	Population	11502
		Household	1966
		The UC is not prone to fl	ood hazard due to Indus River.
Riverine Flood	Nil	However, Liyari River po	asses through the UC and has
RIVEIIIE F1000		rains. In case of exce	essive water in Liyari river,
		overtopping / breaching	and consequent residual risk of

		flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	

Hazard Type Risk Elements at Risk Image: Second	Khandu Goth			
Earthquake Pakka Planned Area 1.461 sq km Pakka Unplanned Area 0.221 sq km Bridges 2 Bus Stops 1 Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage Network 0.663 km Road Network 13.369 km Population 81898 Household 14674	Hazard Type	Risk	Eleme	ents at Risk
Earthquake Pakka Planned Area 1.461 sq km Pakka Unplanned Area 0.221 sq km Bridges 2 Bus Stops 1 Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Earthquake 0.028 sq km Pakka Planned Area 0.024 sq km				
Earthquake Low Pakka Unplanned Area 0.221 sq km Bridges 2 Bus Stops 1 Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage 0.663 km Network 13.369 km Population 81898 Household 14674			Pakka Planned Area	1.461 sq km
Bridges 2 Bus Stops 1 Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674			Pakka Unplanned Area	0.221 sq km
Earthquake Low Bus Stops 1 Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage 0.663 km Network 13.369 km Population 81898 Household 14674 Earthquake Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km		Khandu GotheRiskEleneRiskPakka Planned AreaPakka Unplanned AreaPakka Unplanned AreaBridgesBus StopsEducation FacilitiesHealth FacilitiesHealth FacilitiesMobile TowersPetrol PumpsPost OfficesVelfare TrustIrrigation and DrainageNetworkRailway LineRoad NetworkPopulationHouseholdHouseholdUPakka Planned AreaPakka Unplanned AreaPakka Unplanned AreaIrrigation and DrainageNetworkRailway LineRoad NetworkRailway LineRoad NetworkBridgesEducation FacilitiesLowBridgesEducation FacilitiesMobile TowersPetrol PumpsPopulationHouseholdHouseholdHouseholdHouseholdMedium - ExtremePakka Planned AreaPakka Unplanned AreaPakka Unplanned AreaPopulationHouseholdHouseholdHousehold	2	
Earthquake Low Education Facilities 15 Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674			1	
Earthquake Low Health Facilities 1 Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage 0.663 km Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674			Education Facilities	15
Earthquake Low Mobile Towers 6 Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Health Facilities	1
Earthquake Low Petrol Pumps 5 Post Offices 3 Welfare Trust 1 Irrigation and Drainage 0.663 km Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km Network 0.147 km			Mobile Towers	6
Post Offices 3 Welfare Trust 1 Irrigation and Drainage 0.663 km Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km Network 0.147 km	Farthauake	low	Petrol Pumps	5
Welfare Trust 1 Irrigation and Drainage 0.663 km Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km Network 0.275 hm		20	Post Offices	3
Irrigation and Drainage Network 0.663 km Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Post Offices Welfare Trust Irrigation and Drainage Network Railway Line Road Network Population Household Pakka Planned Area Irrigation and Drainage	1
Railway Line 1.206 km Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Irrigation and Drainage Network	0.663 km
Road Network 13.369 km Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Railway Line	1.206 km
Population 81898 Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Road Network	13.369 km
Household 14674 Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km			Population	81898
Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km Network 0.275 km			Household	14674
Pakka Planned Area 0.098 sq km Pakka Unplanned Area 0.024 sq km Irrigation and Drainage Network 0.147 km				
Pakka Unplanned Area 0.024 sq km Irrigation and Drainage 0.147 km Network 0.075 km			Pakka Planned Area	0.098 sq km
Irrigation and Drainage Network 0.147 km			Pakka Unplanned Area	0.024 sq km
			Irrigation and Drainage Network	0.147 km
kallway Line 0.075 km		Pakka Planned AreaPakka Unplanned AreaBridgesBus StopsEducation FacilitiesHealth FacilitiesMobile TowersPetrol PumpsPost OfficesWelfare TrustIrrigation and DrainageNetworkRailway LineRoad NetworkPopulationHouseholdVersentPakka Planned AreaPakka Unplanned AreaPakka Unplanned AreaPakka Unplanned AreaPakka Unplanned AreaPakka Unplanned AreaIrrigation and DrainageNetworkRailway LineRoad NetworkRailway LineRoad NetworkBridgesEducation FacilitiesMobile TowersPetrol PumpsPopulationHouseholdMedium - ExtremePakka Planned AreaPakka Unplanned AreaPakka Unplanned AreaPopulationHouseholdMedium - ExtremePakka Planned AreaPakka Unplanned AreaPopulationHousehold	Railway Line	0.075 km
Road Network 0.586 km			0.586 km	
Cyclone Low Bridges 1	Cyclone	Low	Bridges	1
Education Facilities 3			Education Facilities	3
Mobile Towers 1			Mobile Towers	1
Petrol Pumps 1			Petrol Pumps	1
Population 5869			Population	5869
Household 1052			Household	1052
Pakka Planned Area 1.456 sq km			Pakka Planned Area	1.456 sq km
Pakka Unplanned Area 0.221 sq km	Heatwaye	Madium Extrama	Pakka Unplanned Area	0.221 sq km
Population 81597			Population	81597
Household 14618			Household	14618
Meteorological Medium Population 82245	Meteorological	Medium	Population	82245

Drought		Household	14735	
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River However, Gujjar Nala passes through the UC and hav potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala overtopping / breaching and consequent residual risk or flooding cannot be ruled out for UC.		
Tsunami	Nil	The UC falls out of vulnero	ıble zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnero	ible zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerc Drought	ble zone for Agricultural	

Khawaja Ajmer			
Hazard Type	Risk	Eleme	ents at Risk
		Pakka Planned Area	0.841 sq km
		Pakka Unplanned Area	0.337 sq km
		Bus Stops	1
		Education Facilities	13
		Grid Stations	1
Earthauake	Low	Mobile Towers	7
		Police Stations	1
		Irrigation and Drainage Network	1.807 km
		Road Network	6.004 km
		Population	80813
	Household	13834	
		Pakka Planned Area	0.089 sq km
		Pakka Unplanned Area	0.023 sq km
	Low Pakka Planned Area Pakka Unplanned Area Bus Stops Education Facilities Grid Stations Mobile Towers Police Stations Irrigation and Drainag Network Road Network Population Household Low Pakka Planned Area Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Pakka Unplanned Area Road Network Grid Stations Mobile Towers Population Household Medium - Extreme Pakka Planned Area Pakka Unplanned Are	Road Network	0.161 km
Cyclone	Low	Grid Stations	1
		Pakka Planned AreaOPakka Unplanned AreaOBus Stops1Education Facilities1Grid Stations1Mobile Towers7Police Stations1Irrigation and Drainage Network1Road NetworkOPopulation8Household1Pakka Planned AreaOPakka Unplanned AreaOPakka Unplanned AreaORoad NetworkOPakka Unplanned AreaOPopulation7Household1Population7Population7Population7Population7Population7Population7Population7Population7Population7Population7Population7Household1Pakka Planned Area0Population7Household1Population8Household1	1
		Population	7829
		Household	1340
		Pakka Planned Area	0.834 sq km
Homburguro	Madium Extrama	Pakka Unplanned Area	0.335 sq km
nearwave	Medium - Extreme	Population	80281
		Household	13744
Meteorological	Medium	Population	81161

Drought		Household	13894
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	
Agricultural Drought	Nil	The UC falls out of vulnerc Drought	ible zone for Agricultural

Madina Colony			
Hazard Type	Risk	Eleme	ents at Risk
		Pakka Planned Area	1.353 sq km
		Pakka Unplanned Area	0.106 sq km
		Bus Stops	3
		Education Facilities	16
		Mobile Towers	5
Earthauake	low	Petrol Pumps	2
	20	Post Offices	1
		Irrigation and Drainage Network	1.767 km
		Road Network	7.33 km
		Population	72844
		Household	12472
		·	
		Pakka Planned Area	0.068 sq km
		Pakka Unplanned Area	0.021 sq km
		Irrigation and Drainage Network	0.105 km
Cyclone	Low	ElemenPakka Planned AreaPakka Unplanned AreaBus StopsEducation FacilitiesMobile TowersPetrol PumpsPost OfficesIrrigation and DrainageNetworkRoad NetworkPopulationHouseholdPakka Planned AreaIrrigation and DrainageNetworkRoad NetworkPopulationHouseholdPakka Unplanned AreaIrrigation and DrainageNetworkRoad NetworkEducation FacilitiesPost OfficesPopulationHouseholdPakka Planned AreaPopulationHouseholdPopulationHouseholdPakka Planned AreaPopulationHouseholdPopulationHousehold	0.129 km
,		Education Facilities	2
		Post Offices	1
		Population	5719
		Household	979
		Pakka Planned Area	1.345 sq km
Hostwayo	Madium Extrama	Pakka Unplanned Area	0.106 sq km
neuiwuve		Population	72401
		Household	12394
Meteorological	Madium	Population	73164
Drought	Medium	Household	12526

Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Liyari river, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
	1	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Mujahid Colony				
Hazard Type	Risk	Eleme	ents at Risk	
		Pakka Planned Area	1.258 sq km	
Hazard Type Risk Earthquake Low	Pakka Unplanned Area	0.222 sq km		
	Bridges	1		
		Bus Stops	1	
		Education Facilities	39	
		Fire Stations	1	
		Health Facilities	3	
		Mobile Towers	2	
Earthquake	Low	Petrol Pumps	6	
		Police Stations	1	
		Post Offices	1	
		Welfare Trust	2	
		Irrigation and Drainage Network	2.478 km	
		Road Network	16.253 km	
		Population	109530	
		Household	20163	
		Pakka Planned Area	0.406 sq km	
		Pakka Unplanned Area	0.032 sq km	
		Irrigation and Drainage Network	0.121 km	
		Road Network	3.339 km	
Cyclone	Low	Bus Stops	1	
		Education Facilities	8	
		Fire Stations	1	
		Health Facilities	1	
		Petrol Pumps	1	
		Population	34317	

		Household	6313	
		Pakka Planned Area	1.24 sq km	
Homburger	Madium Eutroma	Pakka Unplanned Area	0.219 sq km	
nearwave	Medium - Extreme	Pakka Planned Area Pakka Unplanned Area Population Household Population Household The UC is not prone to flow However, Guijar Nala para potential to produce flood rains. In case of excess overtopping / breaching c flooding cannot be ruled o The UC falls out of vulnera The UC falls out of vulnera	107863	
		Pakka Planned Area Pakka Unplanned Area Population Household Population Household The UC is not prone to flo However, Guijar Nala por potential to produce floor rains. In case of exces overtopping / breaching of flooding cannot be ruled of The UC falls out of vulneror	19858	
Meteorological	AA a alium	Population	110351	
Drought	Medium	Household	20314	
Riverine Flood	Nil	The UC is not prone to flo However, Gujjar Nala p potential to produce floo rains. In case of exce overtopping / breaching flooding cannot be ruled	bod hazard due to Indus River. asses through the UC and has uding during monsoon / heavy ssive water in Gujjar Nala, and consequent residual risk of bout for UC.	
	1			
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami	
		1		
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge		
	1			
Agricultural Drought	Nil	The UC falls out of vulner Drought	able zone for Agricultural	

Mustafa Colony				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	1.095 sq km	
		Pakka Unplanned Area	0.07 sq km	
		Bridges	1	
		Bus Stops	3	
		Education Facilities	16 3	
		Health Facilities	3	
Earthauake	Low	Mobile Towers	alth Facilities 3 bile Towers 6 rol Pumps 1 at Offices 1 agation and Drainage	
		Petrol Pumps		
		Post Offices		
		Irrigation and Drainage Network	1.718 km	
		Road Network	6.065 km	
		Population	73877	
		Household	12638	
		Pakka Planned Area	0.068 sq km	
Cyclone	Low	Pakka Unplanned Area	0.006 sq km	
-,		Irrigation and Drainage Network	0.08 km	

		Road Network	0.32 km
		Population	4952
		Household	849
		Pakka Planned Area	1.089 sq km
Hanturava	Medium Eutromo	Pakka Unplanned Area	0.07 sq km
neatwave	Medium - Extreme	Population	73507
		Household	12575
Meteorological	AA a dium	Population	74257
Drought	Medium	Household	12704
		·	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Riverine Flood	
		·	
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	

Naseerabad			
Hazard Type	Risk	Elements at Risk	
		Pakka Planned Area	1.269 sq km
		Ambulance Services	1
		Bus Stops	1
		Education Facilities	8
		Health Facilities	1
		Mobile Towers	1
Earthquake	Low	Petrol Pumps	1
		Post Offices	4
		Tourist Places	1
		Welfare Trust	1
		Road Network	9.281 km
		Population	59928
		Household	11573
		Pakka Planned Area	0.114 sq km
Carlana	low	Road Network	0.577 km
Cyclone	LOW	Education Facilities	1
		Tourist Places	1

		Population	5623
		Household	1087
		Pakka Planned Area	1.265 sq km
Heatwave	Medium	Population	59761
		Household	11539
Meteorological		Population	60347
Drought	Medium	Household	11653
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	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural	
· .g		Drought	

Nazimabad No. 1			
Hazard Type	Risk	Elements at Risk	
		Pakka Planned Area	0.577 sq km
		Pakka Unplanned Area	0.212 sq km
		Bridges	1
		Education Facilities	23
		Fire Stations	1
Farthauako	low	Mobile Towers	2
Earnquake	LOW	Petrol Pumps	5
		Police Stations	1
		Post Offices	1
		Road Network	5.757 km
		Population	61248
		Household	11263
		Pakka Planned Area	0.193 sq km
		Pakka Unplanned Area	0.024 sq km
		Road Network	0.803 km
		Education Facilities	1
Cyclone	Low	Mobile Towers	2
		Petrol Pumps	1
		Post Offices	1
		Population	17223
		Household	3164

		Pakka Planned Area	0.569 sq km
U		Pakka Unplanned Area	0.212 sq km
Heatwave	Medium - Exfreme	Population	60613
		Household	11145
Meteorological	AA o oliuuro	Population	61662
Drought	Medium	Household	11339
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Orangi Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Orangi Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Nusrat Bhutto Colony				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.435 sq km	
		Pakka Unplanned Area	0.478 sq km	
		Bus Stops	3	
		Education Facilities	6	
Earthquake	Low	Mobile Towers	7	
		Police Stations	1	
		Road Network	2.352 km	
		Population	44855	
		Household	8026	
	Low	Pakka Planned Area	0.022 sq km	
		Pakka Unplanned Area	0.048 sq km	
Cyclone		Road Network	0.011 km	
Cyclone		Education Facilities	1	
		Population	3342	
		Household	596	
Hantura	Madium Extreme	Pakka Planned Area	0.433 sq km	
Heatwave	Mealum - Extreme	Pakka Unplanned Area	0.48 sq km	

		Population	44844
		Household	8024
Meteorological		Population	45087
Drought	Mealum	Household	8067
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	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Pahar Ganj				
Hazard Type	Hazard Type Risk Elements at Risk			
	·	·		
		Pakka Planned Area	0.499 sq km	
		Pakka Unplanned Area	0.326 sq km	
		Road Network	2.841 km	
		Population	28534	
		Household	5109	
Earthquake	Low	Bus Stops	2	
		Education Facilities	5	
		Grid Stations	1	
		Mobile Towers	4	
		Petrol Pumps	2	
		Welfare Trust	1	
		Pakka Planned Area	0.052 sq km	
		Pakka Unplanned Area	0.022 sq km	
Cyclone	Love	Road Network	0.28 km	
Cyclone	LOW	Mobile Towers	1	
		Population	3625	
		Household	649	
		Pakka Planned Area	0.499 sq km	
Hantsuma	Mardiana Fatara	Pakka Unplanned Area	0.326 sq km	
Heatwave	Medium - Extreme	Population	28546	
		Household	5110	
Meteorological	AA a aliuma	Population	28643	
Drought	Medium	Household	5128	

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

Paposh Nagar			
Hazard Type	Risk	Elements at Risk	
		Pakka Planned Area	0.971 sq km
		Pakka Unplanned Area	0.178 sq km
		Bridges	1
		Bus Stops	2
		Education Facilities	29
		Mobile Towers	1
		Petrol Pumps	1
Earthquake	Low	Police Stations	1
		Post Offices	1
		Irrigation and Drainage Network	0.292 km
		Railway Line	1.598 km
		Road Network	5.771 km
		Population	83598
		Household	15373
		Pakka Planned Area	0.1 sq km
		Pakka Unplanned Area	0.031 sq km
		Irrigation and Drainage Network	0.106 km
Cyclone	Low	Railway Line	0.068 km
		Road Network	0.172 km
		Education Facilities	6
		Population	10334
		Household	1902
	1		
		Pakka Planned Area	0.963 sq km
Heatwave	Medium - Extreme	Pakka Unplanned Area	0.176 sq km
		Population	82892
		Household	15243
	T		-
Meteorological	Medium	Population	83906

Drought		Household	15430
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Orangi Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Orangi Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerc Drought	ble zone for Agricultural

Qasimabad				
Hazard Type	Hazard Type Risk Elements at Risk			
		Pakka Planned Area	0.658 sq km	
		Pakka Unplanned Area	0.084 sq km	
		Bridges	1	
		Education Facilities	23	
		Mobile Towers	7	
E authau alaa	Law	Petrol Pumps	1	
Earthquake	LOW	Police Stations	1	
		Welfare Trust	1	
		Railway Line	0.002 km	
		Road Network	4.428 km	
		Population	74199	
		Household	14043	
	Low	Pakka Planned Area	0.06 sq km	
		Pakka Unplanned Area	0.013 sq km	
		Road Network	0.761 km	
Cyclone		Bridges	1	
		Education Facilities	3	
		Population	7721	
		Household	1460	
		Pakka Planned Area	0.657 sq km	
Homburger	AA a diuma Eutroma	Pakka Unplanned Area	0.084 sq km	
Heatwave	Medium - Extreme	Population	74009	
		Household	14007	

Meteorological	Madium	Population	74476
Drought	Medium	Household	14095
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Liyari river, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	torm Surge Nil		able zone for Storm Surge
	·		
Agricultural Drought	Nil	The UC falls out of vulnero Drought	able zone for Agricultural

Rizvia Society			
Hazard Type	Hazard Type Risk Elements at Risk		
		Pakka Planned Area	0.339 sq km
	Rizvia Society Type Risk Pakka Planned Pakka Unplanne Bridges Bus Stops Education Facilit Bus Stops Education Facilit Low Health Facilities Mobile Towers Police Stations Velfare Trust Road Network Population Household Low Pakka Planned Pakka Unplanne Road Network Population Household Medium - Extreme Pakka Planned Population Household	Pakka Unplanned Area	0.486 sq km
		Bridges	2
	Rizvia Society I Type Risk I Type Risk Pakka Planned Pakka Unplanne Pakka Unplanne Bridges Bus Stops Education Facilities Mobile Towers Police Stations Velfare Trust Road Network Population Household I Velfare Trust Road Network Population Household Pakka Planned Pakka Unplanne Pakka Unplanne Road Network Education Facilities Household Pakka Unplanne Road Network Education Facilities Population Household Household Household	Bus Stops	1
		Education Facilities	19
Farthauako	low	Rizvia Society Risk Elem Pakka Planned Area Pakka Unplanned Area Bridges Bus Stops Education Facilities Health Facilities Mobile Towers Police Stations Welfare Trust Road Network Population Household ww Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Pakka Unplanned Area Population Household Population Population Household	1
Earnquake	LOW	Mobile Towers	5
	ve Medium - Extreme	Police Stations	1
		Welfare Trust	3
	arthquake	Road Network	1.399 km
		Population	64174
		Household	11803
		Pakka Planned Area	0.078 sq km
		Pakka Unplanned Area	0.042 sq km
	Law	Road Network	0.104 km
Cyclone	LOW	Education Facilities	2
Earthquake Low Cyclone Low Heatwave Medium - Extreme	Population	9222	
		Household	1697
		Pakka Planned Area	0.337 sq km
	Maalium Eutropea	Pakka Unplanned Area	0.486 sq km
neatwave	/viealum - Extreme	Population	64000
		Household	11770
	I	1	

Meteorological	Madium	Population	64457
Drought	Medium	Household	11854
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Orangi Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Orangi Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnero	ible zone for Tsunami
Storm Surge	Storm Surge Nil		ible zone for Storm Surge
Agricultural Drought	Nil	The UC falls out of vulnero Drought	ble zone for Agricultural

Sakhi Hassan					
Hazard Type	Risk	Elements at Risk			
		Pakka Planned Area	1.48 sq km		
		Pakka Unplanned Area	0.317 sq km		
		Bus Stops	1		
		Education Facilities	7		
M	Mobile Towers	4			
Earthquake	Low	Post Offices	2		
		Irrigation and Drainage Network	0.774 km		
		Road Network	8.298 km 79408		
		Population	79408		
		Household	14215		
		Pakka Planned Area	0.054 sq km		
Cyclone	zzard Type Risk Pakka I Pakka I Pakka I Bus Stop Education Mobile Post Of Irrigation Networ Road N Populat Househo ave Medium - Extreme Pakka I Populat Househo ave Medium - Extreme Pakka I Populat Househo Tological Nil	Pakka Unplanned Area	0.011 sq km		
Cyclone	LOW	Population	2978		
	Low Low Medium - Extreme	Household	533		
		Pakka Planned Area	1.477 sq km		
Heatwaye	Madium Extrama	Pakka Unplanned Area	0.317 sq km		
iicuiwuve	Medioin - Exitence	Population	79304		
		Household	14196		
Meteorological		Population	79832		
Drought		Household	14291		
Riverine Flood	Nil	The UC is not prone to flo	ood hazard due to Indus River.		

		However, Gujjar Nala passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Gujjar Nala, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami	
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge	
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought	

Shadman			
Hazard Type	Risk	Elements at Risk	
		Kachcha Area	0.013 sq km
		Pakka Planned Area	0.925 sq km
	Risk Risk Kad Pak Pak Bus Edua Hea Low Mob Post Irrig Netv Roa Pop Hou Low Kad Pop Hou Kad Netv Roa Pop Hou Medium - Extreme Medium Medium	Pakka Unplanned Area	0.015 sq km
		Bus Stops	3
	Risk Low Low Low	Education Facilities	7
		Shadman k Ele Kachcha Area Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Bus Stops Education Facilities Health Facilities Mobile Towers Post Offices Irrigation and Drainage Network Road Network Population Household Kachcha Area Pakka Planned Area Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Irrigation and Drainage Network Road Network Population Household Kachcha Area Pakka Unplanned Area Pakka Planned Area Population Household Household Kachcha Area Pakka Planned Area Population Household Household Household	1
Earthquake	Low	Mobile Towers	2
		Post Offices	3
	Irrigation and Drainage Network	0.452 km	
	Road Network	4.913 km	
		Population	40847
		Household	7314
		Kachcha Area	0.013 sq km
Earthquake Low		Pakka Planned Area	0.058 sq km
		Pakka Unplanned Area	0.003 sq km
Cyclone	Low	Irrigation and Drainage Network	0.002 km
		Road Network	0.14 km
		Population	3563
	Hazard Type Risk arthquake Low yclone Low eatwave Medium - Extreme leteorological Medium	Household	639
		Kachcha Area	0.013 sq km
		Pakka Planned Area	0.922 sq km
Heatwave	Medium - Extreme	Pakka Unplanned Area	0.014 sq km
		Population	40667
		Household	7282
Meteorological	Medium	Population	41215

Drought		Household	7380
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	
Agricultural Drought	Nil	The UC falls out of vulnerc Drought	ble zone for Agricultural

Shafiq Mill Colony			
Hazard Type	Risk	Elements at Risk	
		Pakka Planned Area	1.839 sq km
		Pakka Unplanned Area	0.214 sq km
		Bus Stops	3
		Education Facilities	24
		Fire Stations	2
		Grid Stations	1
		Industries	1
		Mobile Towers	5
Earthquake	Low	Petrol Pumps	4
		Police Stations	1
		Post Offices	1
		Welfare Trust	5
		Irrigation and Drainage Network	0.96 km
		Road Network	14.551 km
		Population	50074
		Household	9608
		Pakka Planned Area	0.048 sq km
Earthquake Low Cyclone Low Heatwave Media Meteorological Drought Media		Pakka Unplanned Area	0.019 sq km
Cyclone	Low	Road Network	0.582 km
		Population	3651
		Household	704
		Pakka Planned Area	1.83 sq km
Hostwayo		Pakka Unplanned Area	0.211 sq km
nediwave	Medium - Extreme	Population	49711
		Household	9541
Meteorological	Medium	Population	50203
Drought	Medium	Household	9632

Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River and Gujjar Nala passes through the UC and have potential to produce flooding during monsoon / heavy rains. In case of excessive water in both the channels, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami
Storm Surge	Nil	The UC falls out of vulnerable zone for Storm Surge
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought

Shah Nawaz Bhutto				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.893 sq km	
		Pakka Unplanned Area	0.274 sq km	
	Shah Nawaz Bhutto Hazard Type Risk Ele Hazard Type Risk Ele Pakka Planned Area Pakka Unplanned Area Pakka Unplanned Area Pakka Unplanned Area Education Facilities Mobile Towers Petrol Pumps Irrigation and Drainag Network Road Network Population Household Ione Low Pakka Planned Area Low Pakka Vanned Area Pakka Unplanned Area Population Household Household Medium - Extreme Pakka Planned Area Pakka Unplanned Area Population Household Household Population Household Household Household Household	14		
		Mobile Towers	6	
Earthauake	Low	Shan Nawaz Bhurro Eleme Pakka Planned Area Pakka Unplanned Area Education Facilities Mobile Towers Petrol Pumps Irrigation and Drainage Network Road Network Population Household Pakka Planned Area Pakka Unplanned Area Irrigation and Drainage Network Road Network Road Network Road Network Road Network Road Network Education Facilities Population Household Pakka Planned Area Pakka Planned Area Population Household Population Household	2	
		Irrigation and Drainage Network	2.026 km	
		Road Network	6.729 km	
		Population	79104	
		Household	13538	
		Pakka Planned Area	0.091 sq km	
		Pakka Unplanned Area	0.025 sq km	
		Irrigation and Drainage Network	0.36 km	
Cyclone	Low	Road Network	0.313 km	
		Education Facilities	1	
		Population	8101	
	RiskPakka Pla Pakka Ung Education Mobile To Petrol Purr Irrigation on Network 	Household	1387	
		Pakka Planned Area	0.887 sq km	
Hoghwayo	Madium Extrama	Pakka Unplanned Area	0.272 sq km	
nealwave	Medium - Extreme	Population	78563	
		Household	13447	
Meteorological	Madium	Population	79542	
Drought	mealum	Household	13613	

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

Sharif Abad				
Hazard Type	Risk	Elements at Risk		
		Pakka Planned Area	0.771 sq km	
		Pakka Unplanned Area	0.069 sq km	
		Bridges	2	
		Education Facilities	9	
		Health Facilities	1	
E authau alao	1 eur	Mobile Towers	2	
Еаттяриаке	LOW	Petrol Pumps	3	
		Post Offices	1	
		Railway Line	2.265 km	
		Road Network	6.896 km	
		Population	85185	
		Household	16121	
		Pakka Planned Area	0.159 sq km	
		Pakka Unplanned Area	0.023 sq km	
		Railway Line	0.053 km	
Cyclone	e Low	Road Network	0.766 km	
Cyclone	LOW	Education Facilities	3	
		Health Facilities	1	
		Population	18247	
		Household	3456	
		Pakka Planned Area	0.761 sq km	
Heatwaye	Medium - Extreme	Pakka Unplanned Area	0.068 sq km	
ncurvave		Population	84141	
		Household	15927	
Meteorological	Medium	Population	85723	
Drought	///edibili	Household	16225	
	-			
Riverine Flood	Nil	The UC falls out of vulner	able zone for Riverine Flood	
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami	

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

Sir Syed					
Hazard Type	Risk	Elements at Risk			
		·			
		Pakka Planned Area	2.079 sq km		
		Pakka Unplanned Area	0.02 sq km		
		Bridges	1		
		Bus Stops	4		
		Education Facilities	9		
		Health Facilities	3		
Earthauake	low	Mobile Towers	9		
	20	Police Stations	1		
		Welfare Trust	1		
		Irrigation and Drainage Network	1.222 km		
		Road Network	8.207 km		
		Population	127499		
		Household	21982		
	Low	Pakka Planned Area	0.127 sq km		
Cyclone		Road Network	0.205 km		
Cyclone		Population	7618		
		Household	1314		
		Pakka Planned Area	2.072 sq km		
Hoghwayo	Medium - High	Pakka Unplanned Area	0.018 sq km		
neuiwuve		Population	127012		
		Household	21901		
			-		
Meteorological	Madium	Population	128636		
Drought	Medioin	Household	22180		
Riverine Flood	Nil	The UC falls out of vulner	able zone for Riverine Flood		
	.				
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami			
	1	1			
Storm Surge	Nil	The UC falls out of vulner	able zone for Storm Surge		
Agricultural Drought	Nil	The UC falls out of vulnerable zone for Agricultural Drought			

Super Market			
Hazard Type	Hazard Type Risk Elements at Risk		
		Pakka Planned Area	0.482 sq km
		Pakka Unplanned Area	0.073 sq km
		Bridges	1
		Education Facilities	20
		Mobile Towers	1
Earthauake	Low	Petrol Pumps	1
1		Police Stations	1
		Irrigation and Drainage Network	0.283 km
		Road Network	3.402 km
		Population	55579
		Household	10518
	T		T
		Pakka Planned Area	0.042 sq km
		Pakka Unplanned Area	0.03 sq km
Cyclone	Low	Irrigation and Drainage Network	0.108 km
		Education Facilities	2
		Population	7613
		Household	1442
	I	I	Γ
		Pakka Planned Area	0.48 sq km
Heatwaye	Medium - Extreme	Pakka Unplanned Area	0.073 sq km
		Population	55317
		Household	10468
Meteorological	Medium	Population	55850
Drought		Household	10569
		The UC is not prone to fle	ood hazard due to Indus River. asses through the UC and has
Riverine Flood	Nil	potential to produce flooding during monsoon / heavy	
		overtopping / breaching and consequent residual risk of	
		flooding cannot be ruled	out for UC.
	1		
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami
	1		
Storm Surge	Nil	The UC falls out of vulner	able zone for Storm Surge
	1		
Agricultural Drought	Nil	The UC falls out of vulner	able zone for Agricultural

	Drought

Water Pump			
Hazard Type	Risk	sk Elements at Risk	
		Pakka Planned Area	1.149 sq km
		Pakka Unplanned Area	0.001 sq km
		Bridges	2
		Education Facilities	14
		Health Facilities	1
		Industries	1
Earthquake	Low	Mobile Towers	2
		Petrol Pumps	4
		Police Stations	1
		Post Offices	3
		Road Network	8.356 km
		Population	32739
		Household	6323
		Pakka Planned Area	0.07 sq km
		Road Network	0.207 km
Cyclone	Low	Population	2857
		Household	551
		Pakka Planned Area	1.148 sq km
11		Pakka Unplanned Area	0.001 sq km
neatwave	Medium - Extreme	Population	32656
		Household	6307
		·	
Meteorological		Population	32883
Drought	Medium	Household	6350
	·		
Riverine Flood	Nil	The UC is not prone to flood hazard due to Indus River. However, Liyari River passes through the UC and has potential to produce flooding during monsoon / heavy rains. In case of excessive water in Liyari river, overtopping / breaching and consequent residual risk of flooding cannot be ruled out for UC.	
Tsunami	Nil	The UC falls out of vulner	able zone for Tsunami
Storm Surge	Nil	The UC falls out of vulner	able zone for Storm Surge
			asie zone for oronin ourge
Agricultural Drought	Nil	The UC falls out of vulner Drought	able zone for Agricultural

Yaseenabad					
Hazard Type	ard Type Risk Elements at Risk				
		Pakka Planned Area	0.976 sq km		
		Pakka Unplanned Area	0.166 sq km		
		Bus Stops	1		
		Education Facilities	21		
		Mobile Towers	2		
		Petrol Pumps	1		
Earthquake	Low	Tourist Places	1		
		Welfare Trust	2		
		Irrigation and Drainage Network	0.023 km		
		Road Network	7.751 km		
		Population	48798		
		Household	9423		
		Pakka Planned Area	0.019 sq km		
		Pakka Unplanned Area	0.007 sq km		
		Road Network	0.161 km		
Cyclone	Low	Mobile Towers	1		
		Tourist Places	1		
		Population	1267		
		Household	245		
			-		
		Pakka Planned Area	0.974 sq km		
Heatwaye	Medium - Extreme	Pakka Unplanned Area	0.164 sq km		
neurwave	Medioin - Exitence	Population	48621		
		Household	9390		
Meteorological	Medium	Population	48882		
Drought	meanin	Household	9440		
		The UC is not prone to fl	ood hazard due to Indus River.		
Riverine Flood	Nil	However, Liyari River passes through the UC and I potential to produce flooding during monsoon / hec rains. In case of excessive water in Liyari riv overtopping / breaching and consequent residual risk flooding cannot be ruled out for UC.			
Tsunami	Nil	The UC falls out of vulnerable zone for Tsunami			
	1	1			
Storm Surge	Nil	The UC falls out of vulner	able zone for Storm Surge		
-	1	1	-		
Agricultural Drought	Nil	The UC falls out of vulner	able zone for Agricultural		

	Drought

ORGANIZATION STRUCTURE FOR DISASTER MANAGEMENT AT DISTRICT LEVEL

INTRODUCTION

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

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

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

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

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

Table 2: District Disaster Management Authority

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 predisaster and post-disaster management activities in the district are carried out promptly and effectively
- To prepare, review and update district level response and contingency plans.
- To identify buildings and places which could, in the event of disaster situation be, used as relief centers and camps and make arrangements for water supply and sanitation in such buildings or places
- To distribute relief and facilitate rescue or ensure disaster preparedness and response
- To ensure operationalization of District Emergency Operation Centre (DEOC) equipped with all necessary gadgets
- To activate the District Emergency Operations Centre (DEOC) and ensure its uninterrupted operation during and after disaster events
- To carry out rapid damage and needs assessment and develop a report for assisting PDMA and other relevant stakeholders
- To coordinate and monitor early recovery and rehabilitation activities with the support of PDMA or relevant local and international stakeholders
- To prepare and continuously update databases of external agency projects, future priority areas, funding framework, available resources, areas of operations/expertise etc.
- To perform other functions as deemed necessary by the provincial government or provincial authority for disaster management in the district

RESPONSIBILITY OF TALUKA DISASTER MANAGEMENT COMMITTEE

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

FUNCTION OF TALUKA DISASTER MANAGEMENT COMMITTEE

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

RESPONSIBILITY OF UNION COUNCIL DISASTER MANAGEMENT COMMITTEE

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

FUNCTION OF UCDMC

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

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

ESTABLISHMENT OF EMERGENCY OPERATION CENTERS

PROVINCIAL EMERGENCY OPERATION CENTER (PEOC)

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

The functions of PEOC are summarized below;

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

DISTRICT EMERGENCY OPERATION CENTER (DEOC)

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

FUNCTION OF DEOC

The functions of DEOC are appended below;

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

SECTOR WISE ROLES AND RESPONSIBILITIES OF GOVERNMENT FUNCTIONARIES

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 sewerage and water ways before monsoon
- 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.

- 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 sewerage and water ways before monsoon
- 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

- 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

- 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

- 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

INFORMATION DEPARTMENT

Pre-Disaster

- Close coordination and liaison with PDMA and DDMA
- Issuance of press releases regarding hazards and preparedness plans of the government during monsoon, and forecastable hazards
- 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

- 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, and settlement of applicable taxes accordingly in coordination with relevant departments

KARACHI WATER AND SEWERAGE BOARD

Pre-Disaster

- Develop emergency response plans for water and wastewater management
- Cleaning of sewerage lines and drains across the city
- Plan for emergency drinking water supplies
- Make incident action checklists for water utilities

During-Disaster

- Ensure supply of drinking water to affected communities
- Coordinate with local bodies to develop temporary sewerage system in shelter places to avoid diseases

After Disaster

- Conduct disaster impact assessment on water situation
- Prepare plan for the following year along with reports and submit to PDMA and concerned department

- Rehabilitation of sewage 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

ARMED FORCES

Pre-Disaster

- Coordinate with the DDMA in the pre-disaster planning
- Prepare necessary equipment, labor, transportation and other materials for emergency interventions
- 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

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 Karachi Central district reveals that the district is relatively safe in terms of natural disasters. The pertinent hazards to district are meteorological hazards including Cyclone and Heatwave. The risk of geophysical hazards is low in the district. In modern technological era, 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	According to MHVRA Study 2022, there is no riverine flood hazard in district Karachi Central
Earthquake	 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 Karachi Central falls away from any major fault line and is unlikely to be affected by a massive earthquake.
	 Some of prominent faults situated in Sindh are (a) Karachi-Jati, (b) Surjan-Jhimpir, (c) Pab Fault (d) Hub Fault and (e) Allah Bund-Rann of Kutch faults.
	3. Though risk of geophysical hazards in Karachi Central district is low but still some actions must be taken to avoid losses in case of minor jolts. Urban settings are most likely to be affected by jolts. Karachi Central is a highly populous district with high-frequency of high-rise buildings and closely spaced houses. 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 Karachi Central district is

	situated.
	 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	 The district has witnessed rapidly increased severity of heatwave in the past five years. The district is densely populated, which significantly increases the chances of severe heatwave impacts.
	2. Heatwaves are forecastable hazards and actions can be taken well before occurrence of heatwaves. The most suitable action is issuance of warnings and alerts in public for precautions and safety. Suitable media for the purpose is social media and SMS.
	3. Scientific studies suggest that, frequency and intensity of heatwaves is increased due to climate change. Though climate change is global phenomena, however, its impacts can be minimized through local interventions. The most efficient and cost-effective solution is tree plantation. Tree plantation must be encouraged at different levels including government functionaries, NGOs, community and individual levels.
	 Additionally, introduction of reduced Urban Heat Islands (UHI) through policies and implementation in infrastructure development will significantly reduce impacts of heatwaves.
Cyclone	1. The cyclone hazard threat to Karachi Central district is Low. The frequency and intensity of cyclone formation in Arabian Sea may further increase due to climate change and global warming. Fortunately, cyclone is forecastable hazard, its intensity, possible landfall, timings etc. can be precisely predicted before landfall. If population to be affected is well aware and already prepared for likely event, then major losses and damages can be minimized. Such example can be seen in regional countries like India, Bangladesh and Philippines etc.
	2. It is utmost important to strengthen cyclone detection and warning systems in the coastal belt along entire coast in Sindh. Community based disaster risk management, capacity development of prone communities, establishment of permanent shelters and provision of life support

	 facilities will increase the trust and confidence of communities on government functionaries in early evacuation process. 3. The introduction and construction of cyclone resistant human dwellings and infrastructure will further ensure minimized damages and losses.
Drought	 Karachi Central is a densely populated district with closely spaced homes and high-frequency of high-rise buildings. Climatic condition of the district can be categorized as Warm and Semi-Arid (Climate Classification of Pakistan (Khan et al., 2010). Average annual rainfall received during a year across the district is 194.77 mm. Little agriculture is practiced in the district which is mainly dependent on rainfall. Since there is little to no agriculture in the district, it won't cause significant change in agricultural production or disturb food supply.
Tsunami	According to MHVRA Study 2022, there is no Tsunami hazard in district Karachi Central

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 FORECASTABLE DISASTERS

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

Action	Timelines	Responsibility
Interaction with PMD for	Based on forecast	PDMA
forecasting and monitoring of		
cyclone and likely landfall		
Dissemination of forecast to	Based on forecast	PDMA
concerned DDMA and local		
community		
Evacuation of population likely to	Before forecasted landfall	PDMA and DDMA
be affected to safe places		
Temporary shelter and camp	Before forecasted landfall	PDMA and DDMA
management for affected		
population and livestock		
Arrangement of initial relief for	During disturbance period	PDMA and DDMA
affectees		
Recovery and resettlement of	Post disaster	PDMA and DDMA
population to native places		

Table 5: Action Plan for Cyclone Hazard Management

Table 6: Action Plan for Heatwave Hazard Management

Action	Timelines	Responsibility
Interaction with PMD for	Based on forecast	PDMA
forecasting and monitoring of		
heatwave		
Dissemination of forecast to	Based on forecast	PDMA
concerned DDMA and local		
community		
Mobilization of NGOs, INGOs	During disturbance period	PDMA and DDMA
and individuals for arrangement		
of heat stroke and medical camps		
within affected areas		

Table 7: Action Plan for Drought Hazard Management

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

ACTION PLAN FOR UNFORECASTABLE HAZARDS

Earthquake

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

Table 8: Actio	n Plan foi	[•] Earthquake Hazard	Management
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Action	Timelines	Responsibility
Mobilization of man and material resources for rescue and recovery	Post disaster	PDMA and DDMA
Mobilization of NGO, INGO, volunteer groups, scouts and armed services for rescue and recovery	Post disaster	PDMA and DDMA
Coordination and establishment of relief camps, mobile medical camps, life support facilities and provision of relief to affectees	Post disaster	PDMA and DDMA
Coordination and mobilization of rescue teams to search and rescue life in collapsed structures	Post disaster	PDMA and DDMA
Coordination with National Disaster Management Authority (NDMA) for seeking assistance from international agencies (depending on severity of events and damages/losses)	Post disaster	PDMA
Coordination and mobilization of resources on Build Back Better principles	Post disaster	PDMA

SOP FOR PEOC AND DEOCS

• For the smooth operation of the emergency activities the PEOC and District Emergency Response Centre (DEOC) will work under defined Standard Operating Procedures (SOPs). These SOPs are broadly categorized in three sections

- a. Action on receipt of early warning, safe evacuation, search and rescue, initial assessment, relief distribution, recovery and deactivation of response.
- b. Coordination and information dissemination
- c. Contingency planning and response actions
- For localized emergencies, the situation shall be dealt within the regular operating mode of the emergency management services in the district.
- DDMA shall activate the DEOC and take the operational lead for the district government response.
- The DEOC will serve as the center for receiving early warning and issuing information to public at village level, taking measures to evacuate people, updating relevant departments, response agencies, and media etc.
- The DEOC will lead the coordination and management of relief operations in affected areas in the district with the assistance of PEOC.
- DEOC will coordinate with all concerned departments and humanitarian agencies at district level.
- DEOC will coordinate for early recovery with the assistance of PDMA and other concerned departments.
- In standby position, PEOC and DEOC shall be alert and ready to start emergency operations. The PEOC shall coordinate with concerned departments like NDMA, PMD, etc. for regular updates on likely disaster events. Once the threat is established, the PDMA shall approve the alert and activate response mechanism of PEOC and DEOC.
- Once PEOC and DEOC activation is approved or issued, both centers will remain fully operational on 24/7 basis and coordination shall be established with all concerned departments.
- PEOC and DEOC will collect regular updates on disaster situation and after normalization of situation and with mutual consultation shall inform PDMA to issue stand down or disaster deactivation call and final report on emergency operations will be circulated to stakeholders.
- The operationalization of PEOC and DEOC means complete activation of centers during disaster situation. Management of PDMA shall ensure full functionalities of PEOC including stock for emergency food, office supplies, communication system with backup support, electricity generators, computers, screens, multimedia projectors and other necessary equipment. While Deputy Commissioner Karachi Central 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	Nil
General Description	According to MHVRA Study 2022, there is no risk of riverine flood in Karachi Central district.

Earthquake		
UCs	a All UCs	
Gene	eral Description	 The Karachi Central district, sits close to a plate boundary and within reach of earthquakes on numerous tectonically active structures surrounding the city.
 The district lies approximately 150 km east of the triple junction bet the Arabian, Indian, and Asian plates. The western and north-tre arms of the triple junction sustain convergent and transcurrent rates o 33 mm/ yr respectively (Apel et al. 2006). 		 The district lies approximately 150 km east of the triple junction between the Arabian, Indian, and Asian plates. The western and north-trending arms of the triple junction sustain convergent and transcurrent rates of 28– 33 mm/ yr respectively (Apel et al. 2006).
 Although residents of Karachi Central felt shaking from the 1945 Makro and 2001 Bhuj earthquakes, and occasional shaking from M 4- earthquakes on faults north and northwest of the city, no earthquake he ever produced documented damage in Karachi Central district. 		
		4. The earthquake hazard intensity for district Karachi Central is "Low"
		5. The earthquake risk intensity for district Karachi Central is "Low".
		Disaster Management Measures
		Preparedness
1.	1. Identifying and inventorying weak buildings and structures especially in urban settings of the district and situation demanding action by concerned departments.	
2.	2. Preparation of landuse plans, town plans and implementation of building codes in new residential schemes, schools, public and private offices.	
3.	Implementation c	of disaster risk reduction measures in public infrastructure development schemes.
4.	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 n with life support etc.	necessary material and equipment required for establishing temporary shelters facilities i.e. mobile medical camps, schools, power supply, water and sanitation
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 face 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 built back better principal.

Heatwave		
UCs At Risk	All UCs	
General Description	 Heatwave is a condition of atmospheric temperature that leads to physiological stress, which sometimes can claim human life. 	
	 Karachi Central has a Warm and Semi-Arid climate (Climate Classification of Pakistan (Khan et al., 2010)) dominated by a long "Summer Season" while moderated by oceanic influence from the Arabian Sea. 	
	3. The district enjoys a tropical climate encompassing mild winters and warm summers. The humidity levels usually remain high from March to November, while very low in winter as the wind direction in winter is north-east.	
	4. Summers in Karachi Central are hot and humid, and the district is prone to deadly heatwaves.	
	5. The warmest month of the year is May.	
	6. The month of January is the coolest month of the year in the district. The influx of very cold and very dry Siberian winds (called "Quetta Waves" in common parlance), bring brief and cold spells to the region, dropping the night temperatures to below 10°C. The average high for the month is 25°C while the average low for the month is a mild 13°C.	
	 A severe heatwave with temperatures as high as 49°C struck Karachi in June 2015. It caused the deaths of about 2,000 people from dehydration and heat stroke across the city. 	

		8. Higher daily peak temperatures of longer duration and more intense heatwaves are becoming increasingly frequent globally due to climate change. Sindh too is feeling the impact of climate change in terms of increased instances of heat wave with each passing year.	
		9. Very high temperature not only affects vegetation but also creates problem for the individuals like heat stroke, skin burn etc.	
		10. According to MHVRA Study 2022, heatwave hazard intensity for district Karachi Central is " Extreme ".	
		11. According to MHVRA Study 2022, heatwave risk for district Karachi Central is " Medium to Extreme ".	
		Disaster Management Measures	
		Preparedness	
1.	Consistent future construction of env and human dwellin	development strategy: Tree plantation, restoration of natural ecosystem, ironment friendly and well planned residential societies, offices, infrastructure gs.	
2.	2. Monitoring for hot weather alerts through local and international sources and issuance of timely Hot Day Advisories, and Hot Day Warnings.		
3.	3. Upgradation of major public health care facilities with necessary equipment and medicines to treat heatstroke patients.		
4.	Heatstroke awarer NGOs and social w	ness campaigns and wide public coverage through media, social media, SMS, velfare organizations.	
5.	Arrangements for u	uninterrupted supply of electricity and water in vulnerable areas.	
		Response	
1.	Mobilization of N facilitation camps c	GOs, social welfare organization and volunteers for arranging heatstroke and distribution of fresh drinking water in affected areas.	
2.	Local radio FM bro	adcasts to disseminate heatstroke safety and precautions.	
3.	Mobilize mobile m area.	nedical teams for first-aid and other medical emergency support in affected	
4.	Record keeping of	heatwave patients and fatalities.	
		Recovery and Rehabilitation	
1.	Post event review of	of heatwave plan and modifications if required.	

Cyclone					
UCs At Risk	All UCs				
General Description	 Though cyclones are rare in the Arabian sea which is a part of North Indian Ocean. Cyclones that form in Arabian sea mostly move towards Western India rather than Pakistan. 				
	2. Due to its geographical setting, district Karachi Central is vulnerable to cyclone hazard.				
	3. Some of the major tropical cyclones that have hit the coastal areas occurred during May 1902, June 1926, June 1964, November 1993, June 1998, May 1999, June 2007 and 2011 and June 2014. The Cyclone Yemyin in 1999 hit three coastal districts of Sindh, where 244 lives were				

was reported.
A cyclone in November, 1993 caused massive rainfall and flooding in Karachi, Thatta, Sujawal and Badin districts and killed 609 people while displaced some 200,000 others.
In May, 1999, the strongest cyclone hit Pakistan moved ashore near Keti Bandar at Category 3 intensity on the Saffir–Simpson scale.
Very hot and dry weather with gusty winds continued for two days in Karachi, Hyderabad, Shaheed Banzirabad, Badin, Mirpurkhas, Tando Allahyar and Thatta districts due to tropical cyclone "TAUKTAE-2021" in the east-central Arabian Sea.
The cyclone hazard in the district is of "Cat-1 TC" intensity
According to MHVRA Study 2022, cyclone risk for district Karachi Central is "Low".

lost, 40177 animals were perished and effected population of 0.5 million

- 1. Community based disaster risk reduction measures and inclusion of disaster prone communities in disaster management cycle, specially preparedness, evacuation and resettlement.
- 2. Establishment of multipurpose permanent shelters with all life support facilities to facilitate safe evacuation of people and livestock.
- 3. Disaster Risk Reduction mainstreaming in development planning.
- 4. Strengthening of cyclone detection, forecasting and warning dissemination centres.
- 5. Launching a series of public awareness campaign in the district by various means including Radio, TV and other media.
- 6. Training of local administration in warning dissemination and evacuation techniques.
- 7. Mobilization of NGOs and community based organizations for awareness on construction of houses, billboards, roof tops, and boundary walls, keeping in view effects of high winds.
- 8. Review/Update emergency response plans and disaster recovery plans.
- 9. Stocking of key equipment and supplies to carry out immediate response activities including evacuation, shelters, medical camps, water and sanitation, power supply, alternate communication means etc.
- 10. Design, practice and implementation of evacuation plans with emphasis on self-reliance.
- 11. Cleaning of water channel, drainage and sewerage before cyclone season in Arabian Sea.
- 12. Readiness of de-watering machines before start of monsoon and cyclone season.

Response

- 1. Issue early reliable warning through siren or other relevant means to reduce the severity of the cyclone related disasters and save valuable human lives.
- 2. Identify, involve and mobilize local NGOs which can assist in community awareness and mobilisation for response.
- 3. Identify and mobilize volunteers' / volunteer organizations which can assist various facets of response like provision of emergency healthcare and relief items.
- 4. Initiate preliminary damage assessment and run search and rescue operations.
- 5. Provision of immediate relief including provision of food and potable water to affectees.
- 6. Deployment of emergency medical support.

7. Provide emergency health care to the affected population, in order to cover risk of spread of epidemic prone diseases like acute watery diarrhea, typhoid fever, malaria and measles, relapsing of fever and acute respiratory illness.

Recovery and Rehabilitation

- 1. Assess damage to buildings across the impacted areas to gather information about the extent and severity of damage.
- 2. Monitor potential water quality issues.
- 3. Rehabilitation on built back better principal.

Drought					
UCs At Risk	All UCs				
General Description	 Karachi Central is a densely populated district, with little agriculture being practiced around the outskirts of the district. 				
	 Climatic condition of the district can be categorized as Warm and Semi- Arid (Climate Classification of Pakistan (Khan et al., 2010) 				
	3. Average annual rainfall received during a year across the district is 194.77 mm.				
	4. According to MHVRA Study 2022,				
	a. Meteorological drought hazard for district Karachi Central is " Extreme "				
	b. Meteorological drought risk for district Karachi Central is "Medium"				
	c. Agricultural drought hazard for district Karachi Central is "Mild"				
	d. Agricultural drought risk for district Karachi Central is " Low ".				
	Disaster Management Measures				
Preparedness					
	Preparedness				
1. Implement Drou indications of th conditions relate	reparedness oght Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events.				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser 	reparedness Ight Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs.				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser Building of small 	reparedness rght Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting				
 Implement Drou indications of th conditions relate Monitoring of tel levels, and reser Building of small Implementation of 	reparedness aght Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management.				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser Building of small Implementation of Control ground w limits. 	Preparedness right Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management. water extraction from upper and lower aquifers to be within the sustainable yield				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser Building of small Implementation of Control ground w limits. 	Preparedness right Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management. water extraction from upper and lower aquifers to be within the sustainable yield Response				
 Implement Drou indications of th conditions relate Monitoring of ten levels, and reser Building of small Implementation of Control ground w limits. 	Preparedness right Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management. water extraction from upper and lower aquifers to be within the sustainable yield Response ut the nature of drought conditions and their impact.				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser Building of small Implementation of Control ground w limits. Assess data abo Provision and ins 	Preparedness right Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management. water extraction from upper and lower aquifers to be within the sustainable yield Response ut the nature of drought conditions and their impact. tallation of solar water pumps for availability of clean drinking water.				
 Implement Drou indications of th conditions relate Monitoring of ter levels, and reser Building of small Implementation of Control ground v limits. 1. Assess data abo 2. Provision and ins 3. Public information	Preparedness right Early Warning System (EWS) at provincial/district level to get clear e impending drought and its consequences, e.g. forecast of impending drought d to changing weather conditions linked to El Nino or La Nina events. mperature, precipitation, potential evapotranspiration, soil moisture, groundwater voirs. -scale reservoir for rainwater harvesting of water supply and demand management. water extraction from upper and lower aquifers to be within the sustainable yield Response ut the nature of drought conditions and their impact. tallation of solar water pumps for availability of clean drinking water. on campaign for water management and saving.				
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Tsunami				
UCs At Risk	Nil			
General Description	According to MHVRA Study 2022, there is no risk of Tsunami in Karachi Central district.			

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 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 Karachi Central. 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				
		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.)				
-		Cyclone				
1.	Establishment of cyclone early warning detection and dissemination system using Common Alert Protocol (CAP).	A single emergency alert using Common Alert Protocol (CAP) can trigger a variety of public warning systems, increasing the likelihood that people receive the alert by one or more communication pathways. The CAP is capable to disseminate rich multimedia such as photographs, maps, streaming video and audio. An early warning system based on CAP may be established at suitable location.				
2.	Preparation of cyclone response and evacuation plan	Collaborate with community leaders to create community evacuation plans, including evacuation zones and routes. Identify and prepare shelter locations above sea level and conduct emergency evacuation trainings to ensure readiness of communities.				
3.	Conduct of District Level Mock Exercise (DLME).	Develop a calendar for mock exercises to assess the preparedness, review the District Disaster Management Plans, Standard Operating Procedures and to evaluate the readiness of various departments to any disaster or emergency.				
4.	Development of insurance policy for financial risk management	Collaborate with Provincial Govt. and Private Partners to devise a disaster insurance policy for vulnerable communities. Disaster insurance provides a means of covering losses incurred through disasters and catastrophic events and reducing disasters' severe financial impact on individuals and communities. Financial liquidity provided by insurance helps mitigate disasters' effects on food security, health and livelihood assets.				

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 DDR) 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 - KARACHI CENTRAL DISTRICT

The existing nature of disaster in Karachi Central district can be categorized as low to extreme. The prominent hazard in the district is heatwave with a very low to extreme risk level. The district is susceptible to effects of cyclone and the risk is categorized as low. There is no risk of storm surge or tsunami in the district. The risk of earthquake is determined to be low. There is low risk of agricultural drought in the district while the risk of meteorological drought is medium. Although there is no risk of riverine flood in the district, the occasional heavy rains can cause urban flooding. Based on the results of the MHVRA study the hazards of the district can be managed through soft and enhanced management measures. In this scenario, cost benefit analysis of proposed interventions is appended in table below:

S. no.	Soft resilience	Cost	Benefit		
	(Behavioral DRR)				
1.	Early warning	Dissemination of forecast of	Early warnings give people time to prepare in		
	system for	heatwaves from the	advance and postpone activities after daytime.		
	heatwave	meteorological department	Local authorities would get ample time to		
		through public radio	establish relief centers with provisions of shade		
		announcements, print and digital	and hydration. Hospitals would be prepared to		
		media to increase the	receive more patients than usual. An overall		
		preparedness of local populace	reduction in emergency cases would reflect in less		
		against the impending hazard.	mortality and more savings in medical		
			expenditure.		
2.	Awareness	Public private partnership and use	Public awareness and public education for		
	campaigns	of electronic/print media for	disaster reduction helps to reduce disaster risks. It		
		raising public awareness is a cost-	mobilizes people through clear messages,		
		effective approach to build	supported with detailed information. People who		
		society resilience and improved	know how to react in case of a disaster.		
		disaster risk management	community leaders who have learned to warn		
		canabilities of vulnerable	their people in time, and whole social layers who		
		communities	have been taught how to prendre themselves for		
		Awaranoss campaians and	natural bazards can contribute to better		
		information discomination for	mitigation strategies and discomination of		
		anomation assemination for	information on the concentration of		
		evacuation and safe practices in	Education and knowledge and provide nearly		
		event of eartinquake.	the rank for the should be an provide people		
			with tools for vulnerability reduction and life-		
	Fault	Discoursing of information	Environmente and a state information of home		
3.	Early warning for		Equipping people with information of neavy		
	neavy rainrai	regarding forecast of neavy			
			profective medsure to secure mein property		
		and radio broadcasts and	against possible urban flooding. Unnecessary		
		under an and a start of the second start of th	activities would be posiponed and mis would		
		action by responsible grantice to	evident		
		be ready to deal with issues	extent.		
		be ready to deal with issues			
	Dra amativa	Ansing from orban hooding.			
4.	rre-emplive	maintenance and cleaning	improved water arainage capacity will ensure		
	maintenance of	activities of storm water aralis,	smooth now of surface runori and prevent		
	water arainage	sewers and along the natural	accumulation of water in urban areas, preventing		
	system	sireams to increase water flow	necessary and less back as a first fit		
		capacity prior to the onset of	property and less hindrance to frattic flow.		
5	Strengthening of	Setup of temporary boolth	Mobile health facilities play a very significant		
J.	strengthening of	serop of remporary nearm	mobile lieuliti rucililes piùy a very significant		

Table 9: Cost Benefit Analysis of Disaster Risk Measures in District Karachi Central

	mobile health	facilities reduce difficulty in	role in the mitigation of disaster because of their
	care facilities	patients' transportation to	particular function in providing essential first aid.
		permanent hospital facilities.	Ease of access to basic health facilities will reduce
		Mobile health care units are	burden on hospitals.
		already available with	The systematic organization and easy
		government of Sindh, their	mobilization of the staff, equipment and medical
		mobilization to disaster	supplies in a safe environment are crucial if
		management will ensure	disaster response is to be prompt and effective.
		lifesaving.	
6.	Shelters for	Temporary roadside shelters with	Shelters can provide shade and hydration to
	heatwave	provision of shade and hydration	people within easy access. Shade would provide
	mitigation	to provide necessary relief from	relief from sunlight and provide an area of
		humid and hot climate during	temporary recess. This would reduce the number
		periods of heatwave.	of heatstroke cases, which in turn would reduce
		Encouragement of plantation of	the number of emergency cases arriving at the
		trees, which can provide cool	hospital. Overall benefit would be a reduction in
		shade when fully grown.	medical expenses and prevention of avoidable
			mortality.

ANNEX – A – 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: Upper left corner: Lower right corner: Lower left corner:	24°53'43.18"N 24°53'44.31"N 24°53'39.14"N 24°53'40.58"N	67° 1'26.57"E 67° 1'20.96"E 67° 1'27.54"E 67° 1'20.1 <i>5</i> "E	5.76	~518	37
2	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°54'43.74"N 24°54'43.29"N 24°54'39.56"N 24°54'39.67"N	67° 1'50.65"E 67° 1'46.96"E 67° 1'49.90"E 67° 1'46.16"E	3.57	~320	62
3	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°54'54.74"N 24°54'51.05"N 24°54'50.96"N 24°54'48.60"N	67° 2'43.18"E 67° 2'40.07"E 67° 2'45.70"E 67° 2'41.76"E	4.18	~375	61
4	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°55'56.23"N 24°55'58.98"N 24°55'51.53"N 24°55'55.60"N	67° 1'33.53"E 67° 1'21.81"E 67° 1'31.11"E 67° 1'20.78"E	12.3	~1100	103
5	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°56'13.38"N 24°56'17.41"N 24°56'8.21"N 24°56'12.24"N	67° 3'4.54"E 67° 2'59.05"E 67° 3'0.02"E 67° 2'54.43"E	10.2	~917	85
6	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°55'32.92"N 24°55'33.90"N 24°55'27.97"N 24°55'30.35"N	67° 4'22.86"E 67° 4'13.40"E 67° 4'16.46"E 67° 4'12.96"E	7.40	~665	78

7	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°56'12.90"N 24°56'15.39"N 24°56'6.00"N 24°56'11.00"N	67° 4'57.84"E 67° 4'52.51"E 67° 4'58.57"E 67° 4'46.91"E	16.3	~1450	78
8	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°56'50.84"N 24°56'57.70"N 24°56'46.38"N 24°56'52.87"N	67° 3'44.08"E 67° 3'35.23"E 67° 3'41.01"E 67° 3'30.61"E	17.0	~1524	110
9	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°57'29.58"N 24°57'32.77"N 24°57'24.73"N 24°57'29.02"N	67° 2'45.26"E 67° 2'39.32"E 67° 2'41.11"E 67° 2'35.44"E	8.61	~775	222
10	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°57'6.59"N 24°57'3.84"N 24°57'2.82"N 24°57'0.32"N	67° 4'45.83"E 67° 4'42.07"E 67° 4'48.57"E 67° 4'45.23"E	4.44	~400	109
11	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°58'5.40"N 24°58'5.07"N 24°57'56.81"N 24°57'56.51"N	67° 3'42.51"E 67° 3'35.68"E 67° 3'43.01"E 67° 3'36.19"E	12.5	~1125	138
12	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°58'55.51"N 24°58'55.03"N 24°58'48.48"N 24°58'47.94"N	67° 4'24.71"E 67° 4'15.25"E 67° 4'25.67"E 67° 4'15.67"E	14.8	~1325	142
13	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°59'6.52"N 24°59'6.46"N 24°58'59.95"N 24°58'59.81"N	67° 3'38.80"E 67° 3'34.78"E 67° 3'39.12"E 67° 3'35.18"E	5.71	~510	165
14	Upper right corner: Upper left corner: Lower right corner: Lower left corner:	24°59'49.87"N 24°59'49.82"N 24°59'45.33"N 24°59'45.13"N	67° 3'28.50"E 67° 3'24.54"E 67° 3'28.7 <i>5</i> "E 67° 3'24.84"E	4.0	~362	178
15	Upper right corner:	24°59'39.02"N 67° 4'51.58"E		~850	152	
----	---------------------	-----------------------------	------	------	-----	
	Upper left corner:	24°59'38.76"N 67° 4'43.77"E	0.42			
	Lower right corner:	24°59'32.96"N 67° 4'51.79"E	9.43			
	Lower left corner:	24°59'33.54"N 67° 4'44.05"E				

A total of 15 shelter locations have been selected as Earthquake shelter places across the district. 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 12,216 tents approximately (tent with size of 45 sq. m each) can be set up within the demarcated shelter places

ANNEX – B – LIST OF EQUIPMENT AVAILABLE IN DISTRICT KARACHI CENTRAL

Equipment	Quantity
De-watering Machine	25
Dumper	19
Fire Brigade / Engine / Tender	3
Tractor / Trolley / Blade	88
Vehicle / Bus / Van / Truck	24
Water Tanker	7
Loader	8
Cess Pool	12
Tralor	5
Ambulances	41
Refuge Van	21

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