

DISASTER RISK REDUCTION STRATEGY
**PROVINCIAL DISASTER
RESPONSE PLAN**

2018

PROVINCIAL DISASTER MANAGEMENT AUTHORITY PUNJAB



Provincial Disaster Response Plan 2018
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SECURING LIVES AND LIVELIHOOD

PROVINCIAL DISASTER MANAGEMENT AUTHORITY PUNJAB

FOREWORD

The frequency of Natural disasters is undeniably increasing due to the change in climatic patterns, urbanization, population growth and destruction of the natural environment which has not contributed only to the physical vulnerabilities but also weighing heavily upon economies of the developing countries. Although completely circumventing the disasters is beyond human manipulation, yet timely preparedness by putting the material, financial and human resources in place, the life and livelihood losses could reasonably be attenuated. Disaster Risk Management is a holistic and integrated business, the core of which is maintaining concerted coordination amongst all the agencies on board. During a disaster, timely dissemination and sharing of every forthcoming information through the conventional and modern means of media - radio, television, cell phones, internet, satellite, remote sensing for early warning, telemetry and meteorology, etc. can equally be of abundant utility in executing rescue, response and rehabilitation activities.

In its endeavor towards understanding disaster risk in all its dimensions of exposure, vulnerability, hazard characteristics / mapping, strengthening of disaster risk governance, accountability for disaster risk management and preparedness to “Build Back Better”, PDMA Punjab has undertaken several initiatives like establishment of Hi-Tech Command, Control and Communication Center, Satellite Based Connectivity with DDMA's and Line Departments, Inventory Management System (IMS), Punjab Disaster Management Information System (PDMIS), Integrated Early Warning System (IEWS) and etc.

This Provincial Disaster Response Plan 2018 incorporates all global disaster risk reduction strategies like Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals (SDGs) and aims at assisting PDMA and all other stakeholders in fighting any emergency and its ensuing events. Sincere efforts have been put in to make the plan a practicable action guideline for all institutions. Now, it is the responsibility of all concerned to go through the Plan seriously, and make arrangements for tapping maximum benefit out of it.

MUDDASIR WAHEED MALIK
DIRECTOR GENERAL, PDMA PUNJAB

MESSAGE FROM SMBR/CHAIRMAN PDMA

Climate change, rapid population growth and the break-neck pace of urbanization have led to unprecedented damages occurring in the wake of natural disaster events in Pakistan. Disaster management has therefore become an important aspect of government functioning. Disaster Management is the coordination and integration of all activities necessary to build, sustain and improve the capability to prepare for, protect against, respond to and recover from any disaster. Such action has to be multi-jurisdictional, multi-sectoral, multi-disciplinary and multi-resource initiative. Therefore, it is vital that the Provincial Government, District Administrations and the private sector discharge their respective roles and responsibilities and complement each other in achieving shared goals of disaster management.

In its commitment to safeguard the lives, properties, livestock, crops and livelihoods of the vulnerable communities of flood prone areas, the Provincial Disaster Management Authority, Punjab has devised Provincial Disaster Response Plan (PDRP) for the year 2018. Standard Operating Procedures (SOP) for all concerned Government Departments have been chalked out through consultative process. Roles and responsibilities of all departments have been defined and fixed in accordance with their overall mandate. Disaster Risk Reduction has been added to this plan as a cross cutting theme. Provincial Disaster Management Authority (PDMA) Punjab in collaboration with other Government Departments and District Administrations (DDMAs) will make every possible effort to keep vulnerable communities safe in the event of any disaster.

MUHAMMAD ASLAM
SMBR/CHAIRMAN PDMA, PUNJAB

GLOSSARY OF ACRONYMS

AC	Assistant Commissioner	NADRA	National Database and Registration Authority
ADIO	Assistant Disease Investigation Officer	NDMA	National Disaster Management Authority
BHU	Basic Health Unit	NEOC	National Emergency Operation Center
CBO	Community Based Organization	NFI	Non Food Items
CCCC	Command, Control and Communication Center	NGO	Non-Governmental Organization
CDA	Cholistan Development Authority	NHA	National Highway Authority
CERC	Central Emergency Response Committee	NLC	National Logistics Cell
C&W	Communication and Works Department	NTC	National Telecommunication Corporation
DC	Deputy Commissioner	OCHA	Office for the Coordination of Humanitarian Response
DDMA	District Disaster Management Authority	OMC	Oil Marketing Company
DGHS	Directorate General Health Services	PDMA	Provincial Disaster Management Authority
DHQ	District Headquarter Hospital	PHA	Parks and Horticulture Authority
DPO	District Police Officer	PHED	Public Health Engineering Department
DRF	Disaster Response Force	PID	Provincial Irrigation Department
DRM	Disaster Risk Management	PITB	Punjab Information Technology Board
DRR	Disaster Risk Reduction	POL	Petroleum Oil & Lubricants
DRTA	District Regional Transport Authority	PRCS	Pakistan Red Crescent Society
EPD	Environment Protection Department	PTA	Pakistan Telecommunication Authority
FAO	Food and Agriculture Organization	RHC	Rural Health Center
FFC	Federal Flood Commission	SDG	Sustainable Development Goal
IDP	Internally Displaced Persons	SFDRR	Sendai Framework for Disaster Risk Reduction
LDA	Lahore Development Authority	SUPARCO	Space and Upper Atmosphere Research Commission
LGCD	Local Government & Community Development	THQ	Tehsil Headquarter Hospital
LWMC	Lahore Waste Management Company	WFP	World Food Program
MCs	Metropolitan / Municipal Corporations	WPP	Water Purifying Pills
MISP	Minimum Initial Service Package		

DISASTER RELATED TERMS

CAPACITY

It is the combination of all the strength and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster. Capacity may include physical, institutional, social or economic means as well as skilled personnel or collective attributes such as leadership and management.

CAPACITY BUILDING

Efforts aimed to develop human skills or societal infrastructure within a community or organization needed to reduce the level of risk. In extended understanding, capacity building also includes development of institutional, financial, political and other resources, at different levels of the society.

CLIMATE CHANGE

The climate of a place or region is changed if over an extended period (typically decades or longer) there is a statistically significant change in measurements of either the mean temperature or variability of the climate for that region.

CONTAMINATION

The word contamination means to pollute. Whether it is food, air, or water, when you contaminate something, you make it impure or hazardous. Contaminate comes from the Latin word contaminate meaning “made impure”.

COPING CAPACITY

The means by which people or organizations use available resources and abilities to face a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions.

DEHYDRATION

Dehydration is a condition caused by the excessive loss of water from the body, which causes a rise in blood sodium levels. Since dehydration is most often caused by excessive sweating, vomiting, or diarrhea, water loss is usually accompanied by a deficiency of electrolytes.

DISASTER

A serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources. It results from the combination of hazards, conditions of vulnerability and insufficient capacity to reduce the potential negative consequences of risk.

DISASTER RISK MANAGEMENT

It is the comprehensive approach to minimize the adverse impacts of a disaster. DRM encompasses all actions taken before, during, and after the disasters. It includes activities on mitigation, preparedness, emergency response, recovery, rehabilitation, and reconstruction.

DISASTER RISK REDUCTION

The measures aimed to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

EARLY WARNING

The provision of timely and effective information, through identified institutions, to communities and individuals so that they could take action to reduce their risks and prepare for effective response.

EMERGENCY MANAGEMENT

The management and deployment of resources for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation.

EPIDEMIC

An outbreak or unusually high occurrence of a disease or illness in a population or area, epidemic is an outbreak of a disease that spreads rapidly among individuals in an area or population at the same time.

FORECAST

Estimate of the occurrence of a future event. This term is used with different meanings in different disciplines.

HAZARD

Anything that have the Potential of damaging physical event or phenomenon that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can include natural (geological, hydro meteorological and biological) or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity, frequency and probability.

HAZARD ANALYSIS

Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behavior.

INFESTATION

Infestation is the state of being invaded or overrun by pests or parasites. It can also refer to the actual organisms living on or within a host.

LAND-USE PLANNING

Branch of physical and socio-economic planning that determines the means and assesses the values or limitations of various options in which land is to be utilized, with the corresponding effects on different segments of the population or interests of a community taken into account in resulting decisions. Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas, control of population density and expansion, structural and non-structural mitigation measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

NATURAL HAZARDS

Natural disasters or phenomenon occurred on earth that may constitute a damaging event. Natural hazards can be classified by origin namely: geological, hydro meteorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.

PREPAREDNESS

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.

PREVENTION

Activities to ensure complete avoidance of the adverse impact of hazards.

PUBLIC AWARENESS

The process of informing the general population about the increasing levels of consciousness, risks and how people can reduce their exposure to hazards. This is particularly important for public officials in fulfilling their responsibilities to save lives and property in the event of a disaster.

RECOVERY

Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

RELIEF /RESPONSE

The provision of assistance during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.

RESILIENCE / RESILIENT

The capacity of a community, society or organization potentially exposed to hazards to adapt, by resisting or changing in order to maintain an acceptable level of functioning. Resilience can be increased by learning from past disasters for better future protection and to improve risk reduction measures.

RETROFITTING (OR UPGRADING)

Reinforcement of existing buildings and structures to become more resistant and resilient to the forces of natural hazards.

RISK

The chances of losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between hazards and vulnerable social conditions. Risk is expressed as $\text{Risk} = \text{Hazards} \times \text{Vulnerability}$. Some experts also include the concept of exposure to refer to the physical aspects of vulnerability.

RISK ASSESSMENT / ANALYSIS

A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing vulnerability that could pose a potential threat to people, property, livelihoods and the environment.

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CH. 1

DISASTER RISK REDUCTION AND PDMA PUNJAB

1.1 INTRODUCTION

Disaster is defined as “a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses or impacts and which exceed the ability of the affected community or society to cope using its own resources.” Disasters arise from the combination of natural hazards, conditions of vulnerability, and insufficient capacity or measures to reduce or cope with the potential negative consequences.

Recently, climate-related stresses and shocks already figure prominently in the lives of many of the world’s people and particularly so in the lives of the poor. Events such as droughts, floods and storms are often terrible experiences for those affected: they cause great loss of life, destroy countless livelihoods and leave millions of people devastated. In the coming decades, climate change is expected to exacerbate the risks of disasters. More frequent and intense storms and floods and long-lasting droughts can erode existing community coping capacity to prepare, respond and rebuild after successive hazard events.

The other adverse impacts of climate change, for example on public health, ecosystems, food security, migration and on the situation of specially vulnerable groups such as children, the elderly and women, will increase the vulnerability of communities to natural hazards of all types. Any increase in disasters, whether large or small, will threaten development gains and hinder the implementation of the Sendai Framework for Disaster Risk Reduction (SFDRR) Targets and Sustainable Development Goals (SDGs). Country like Pakistan that is already of humanitarian concern and has populations that are highly vulnerable will face even greater risk owing to the impact of climate change.

Globally, during the past 20 years, the number of recorded disasters has doubled from approximately 200 to more than 400 per year. Disasters caused by floods are more frequent (from about 50 in 1985 to more than 200 in 2005) and damage larger areas than they did twenty years ago. Current trends indicate a future where extreme climate variability and its consequences are likely to become the norm.

1.2 GLOBAL DISASTER RISK REDUCTION STRATEGIES

Disaster risk and the adverse impacts of natural hazards can be reduced by monitoring, systematically analyzing and managing the causes of disasters, reducing social and economic vulnerability, and improving preparedness for response to adverse hazard events. The two main elements that give rise to risk are:-

- a. The hazards – the potential damaging events or phenomenon
- b. The vulnerability of populations to these hazards.

Natural hazards by themselves do not cause disasters; it is the combination of an exposed, vulnerable and ill-prepared population or community with a hazard event that results in a disaster. Human activity, such as land use changes, environmental exploitation and unplanned settlement, often exacerbates the level of disaster risk.

Based on these concepts, the Hyogo Framework for Action in 2005 sets out strategies for reducing disaster risks through five priorities for action (Table 1.1).

TABLE 1.1: HYOGO FRAMEWORK 2005 PRIORITIES FOR ACTION

Priority 1.	Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
Priority 2.	Identify, assess and monitor disaster risks and enhance early warning.
Priority 3.	Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
Priority 4.	Reduce the underlying risk factors.
Priority 5.	Strengthen disaster preparedness for effective response.

The Sendai Framework for Disaster Risk Reduction 2015 – 2030 was adopted at the Third United Nations World Conference on Disaster Risk Reduction, held from 14 to 18 March 2015 in Sendai, Miyagi, Japan. This Framework aims to achieve certain outcome by pursuing a goal through seven global targets to be implemented by 2030 (Table 1.2).

TABLE 1.2: SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015-2030

SFDRR OUTCOME	The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.
SFDRR GOAL	Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

SFDRR TARGETS	TARGET 1.
	Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015.
	TARGET 2.
	Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015.
	TARGET 3.
	Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.
	TARGET 4.
	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
	TARGET 5.
	Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
	TARGET 6.
	Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030.
	TARGET 7.
	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

Taking into account the experience gained through the implementation of the Hyogo Framework for Action, and in pursuance of the expected outcome and goal, there is a need for focused action within and across sectors by States at local, national, regional and global levels in the four priority areas (Table 1.3).

TABLE 1.3: SFDRR PRIORITIES FOR ACTION

Priority 1	Understanding disaster risk.
Priority 2	Strengthening disaster risk governance to manage disaster risk.
Priority 3	Investing in disaster risk reduction for resilience.
Priority 4	Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

The United Nations General Assembly adopted the 2030 Agenda for Sustainable Development on September 25, 2017, that guides the global action for the next 15 years through 17 Goals. It focuses on five key themes including – people, planet, prosperity, peace and partnership; with a wider scope, geographical coverage and improved emphasis on sustainability. There are 169 targets for the 17 goals (Figure 1.1). Each target has between 1 and 3 indicators used to measure progress toward reaching the targets. In total, there are 304 indicators that will measure compliance.

Figure 1.1: Sustainable Development Goals (SDGs)



1.3 PDMA PUNJAB AND GLOBAL DISASTER RISK REDUCTION STRATEGIES

Provincial Disaster Management Authority (PDMA) Punjab while fully cognizant of the changing global scenarios vis-à-vis Climate Change, Disaster Risk Reduction and Disaster Management is devising disaster risk reduction strategies keeping in view the 07 Global Targets of Sendai Framework for Disaster Risk Reduction (Table 1.2) and overall 10 Sustainable Development Goals (SDGs) having 13 Targets and 19 Indicators (Table 1.4) and (Figure 1.2).

TABLE 1.4: PDMA PUNJAB'S FOCUSED SDGs

Goals	Targets	Indicators
Goal 1 No Poverty	Target 1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	Indicator 1.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people. Indicator 1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP) Indicator 1.5.3 Number of countries with national and local disaster risk reduction strategies.
Goal 2 Zero Hunger	Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agriculture practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	Indicator 2.4.1 Proportion of agriculture area under productive and sustainable agriculture.
Goal 3 Good Health	Target 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.	Indicator 3.d.1 International health regulations (IHR) capacity and health emergency preparedness.
Goal 4 Quality Education	Target 4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.	Indicator 4.a.1 Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single sex basic sanitation facilities; and (g) basic hand washing facilities (as per the WASH indicator definitions).

Goal 6 Clean Water and Sanitation	Target 6.6 By 2020, protect and restore water related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.	Indicator 6.6.1 Change in the extent of water-related ecosystems overtime.
Goal 9 Industry, Innovation and Infrastructure	Target 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being with a focus on affordable and equitable access for all. Target 9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing states.	Indicator 9.1.1 Proportion of the rural population who live within 2km of an all-season road. Indicator 9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure.
Goal 11 Sustainable Cities and Communities	Target 11.5 By 2030, significantly reduce the number of deaths and the number of people affected substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations. Target 11.b By 2020 substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.	Indicator 11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people. Indicator 11.5.2 Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services. Indicator 11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030. Indicator 11.b.2 Number of countries with national and local disaster risk reduction strategies.

Goal 13 Climate Action	Target 13.1	Indicator 13.1.1
	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	Number of countries with national and local disaster risk reduction strategies.
		Indicator 13.1.2
		Number of deaths, missing persons and persons affected by disaster per 100,000 people.
	Target 13.3	Indicator 13.3.1
	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curriculum.
		Indicator 13.3.2
		Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions.
Goal 14 Life Below Water	Target 14.2	Indicator 14.2.1
	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.	Proportion of national exclusive economic zones managed using ecosystem-based approaches.
Goal 15 Life on Land	Target 15.3	Indicator 15.3.1
	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world.	Proportion of land that is degraded over total land area.

Figure 1.2: PDMA Punjab's Focused SDGs



1.4 DISASTER RISK PROFILE OF PUNJAB PROVINCE

The Province of Punjab, the land of five rivers, is the most populous province of Pakistan with approximately 56% of the country's total population. It has an area of 79,284 square miles (205,345 square km) and a population of exceeding 110 million. It consists of 36 administrative districts and 9 administrative divisions and is bordered by the Indian state of Jammu and Kashmir to the northeast, the Indian states of Punjab and Rajasthan to the east, Sindh to the south, Baluchistan and Khyber Pakhtunkhwa (KPK) to the west, and Islamabad and Azad Kashmir to the north. Punjab is the main food basket of the country, generally land is fertile land. A large portion of Punjab is arable owing to the system of the five rivers which flow through the province namely Chenab, Jhelum, Ravi, Sutlej and Sindh or Indus River itself (Figure 1.3). These rivers traverse the Province from north to south making the province the most heavily irrigated and fertile land on earth, while the south has deserts of Cholistan with a barren landscape facing water scarcity and heavy dependency on rain. Weather extremes are notable from the hot and barren south to the cool and scenic hills of the north.

AREA OF
79,284
square miles

POPULATION exceeding
110 million



Figure 1.3: Rivers of Punjab



In Punjab the temperatures begin to rise in the middle of February leading to spring which continues until mid-April. April onwards the summer hot weather sets in causing the air to rise and creating low pressure areas. Moisture laden winds from Indian Ocean rush into the low pressure region directly above Punjab and other Provinces of Pakistan and India. This phenomenon is known as the southwest monsoon. June and July are oppressively hot with temperatures hovering as high as 50°C. These rising temperatures cause the monsoon winds to blow into areas above Punjab and release their moisture in the form of excessive rains. The monsoon rains are usually observed between July and September. Furthermore, El Nino phenomenon acts as catalyst to the monsoon rains. This weather pattern causes heavy rain and seasonal floods in the province. Flooding in rivers is generally caused by heavy concentrated rainfall in the catchments during the monsoon season, which is sometimes augmented by snowmelt flows. These large seasonal variations further aggravate the conditions and the intensity of floods at times is increased several folds due to sudden cloud bursts as was the case in 2012 in the river Indus at Rahim Yar Khan and 2014 in Chenab at Sialkot.

This unique geographical juxtaposition has made the province of Punjab vulnerable to most kinds of disasters, with particularly river flood and hill torrents frequently occurring since 2010. Punjab faces floods in varying intensity almost every year. There have also been examples of tornadoes and earthquakes in the province but their frequency have been quite low, with most of the Punjab being relatively safe with regards to vulnerability to earthquakes. Some areas such as Murree and parts of the Rawalpindi Division are located on the fault line hence vulnerable to earthquakes. Apart from above mentioned areas an old fault line is activated near Nankna Sahib. Tornadoes too have been a rare happening in Punjab but nevertheless a force of nature to reckon with. Punjab's geographic location and climatic conditions make it more vulnerable to monsoon floods and droughts in the southern areas. The effects of climate change and associated variability in the monsoons means that the occurrence and intensity of floods have significantly been increased in the last few years. Punjab has witnessed

floods of various intensities in the last seven years due to climatic changes. The worrisome facts are that different rivers have caused flooding in different areas of the province including riverine, urban and flash floods (hill torrents) during last seven years. Table 1.5 depicts various disaster types and vulnerable district in Punjab.

TABLE 1.5: DISASTER TYPES AND DISTRICTS' VULNERABILITY IN PUNJAB

Disaster Types		Vulnerable Districts / Areas
Riverine Flooding	Indus	Mianwali, Bhakkar, Layyah, Muzaffargarh, DG Khan, Rajanpur, R.Y. Khan
	Jhelum	Jhelum, M.B. Din, Khushab, Jhang
	Chenab	Gujranwala, Gujrat, Sialkot, Sargodha, Chiniot, Hafizabad, Jhang, Khanewal, Multan
	Ravi	Lahore, Sheikhupura, Nankana Sahib, Okara, Sahiwal, Khanewal
	Sutlej	Kasur, Pakpattan, Vehari, Lodhran, Bahawalnagar, Bahawalpur
Flash Floods		Mianwali, D.G. Khan, Rajanpur
Urban Flooding		Lahore, Rawalpindi, Gujranwala, Sialkot, Faisalabad, Narowal, Sheikhupura, Multan
Droughts		The areas of Cholistan in District Bahawalpur, Bahawalnagar and R.Y. Khan alongwith Layyah etc.
Forest Fires		Lahore (Changa Manga), Pabbi, Margala and Murree
Earthquakes		Rawalpindi, Murree, Attock, Nankana Sahib

1.5 DISASTER RISK REDUCTION STRATEGIES AND INITIATIVES OF PDMA PUNJAB

PDMA Punjab was established after promulgation of National Disaster Management Act 2010. As per its mandate (Table 1.6) and keeping in view the global disaster risk reduction activities, PDMA Punjab has taken several disaster risk reduction initiatives by adopting different strategies to understand disaster risks, strengthening disaster risk governance to manage disaster risk, investing in disaster risk reduction for resilience and enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

TABLE 1.6: PDMA PUNJAB'S MANDATE

Policy	<ul style="list-style-type: none"> Formulate the provincial disaster management policy obtaining the approval of the Provincial Commission Coordinate and monitor the implementation of the National Policy, National Plan and Provincial Plan
Risk Mitigation	<ul style="list-style-type: none"> Examine the vulnerability of different parts of the province to different disasters and specify prevention of mitigation measures

Disaster Management Plans	<ul style="list-style-type: none"> • Lay down guidelines to be followed for preparation of disaster management plans by the Provincial Department and District Authorities
Preparedness	<ul style="list-style-type: none"> • Evaluate preparedness at all governmental or non-governmental levels to respond to disaster and enhance preparedness. • Examine the construction in the area and if it is in the opinion that the standards laid down have not been followed it may direct the same to secure compliance of such standards • Ensure that communication systems are in order and disaster management drills are being carried out regularly, and performance of such other functions as may be assigned to it by the National or Provincial Authority
Disaster Response	<ul style="list-style-type: none"> • Coordinate response in the event of disaster • Give directions to any Provincial Department or authority regarding actions to be taken in response to disaster • Provide indispensable technical assistance or give advice to the District Authority and Local Authorities for conveying out their functions effectively
Community Based DRM	<ul style="list-style-type: none"> • Promote general education, awareness and community training relating to the actions to be taken in response to disaster.
Fiscal Management	<ul style="list-style-type: none"> • Advise the Provincial Government regarding all financial matters in relation to disaster management

1.5.1 INTEGRATED EARLY WARNING SYSTEM (IEWS) THROUGH SATELLITE CONNECTIVITY

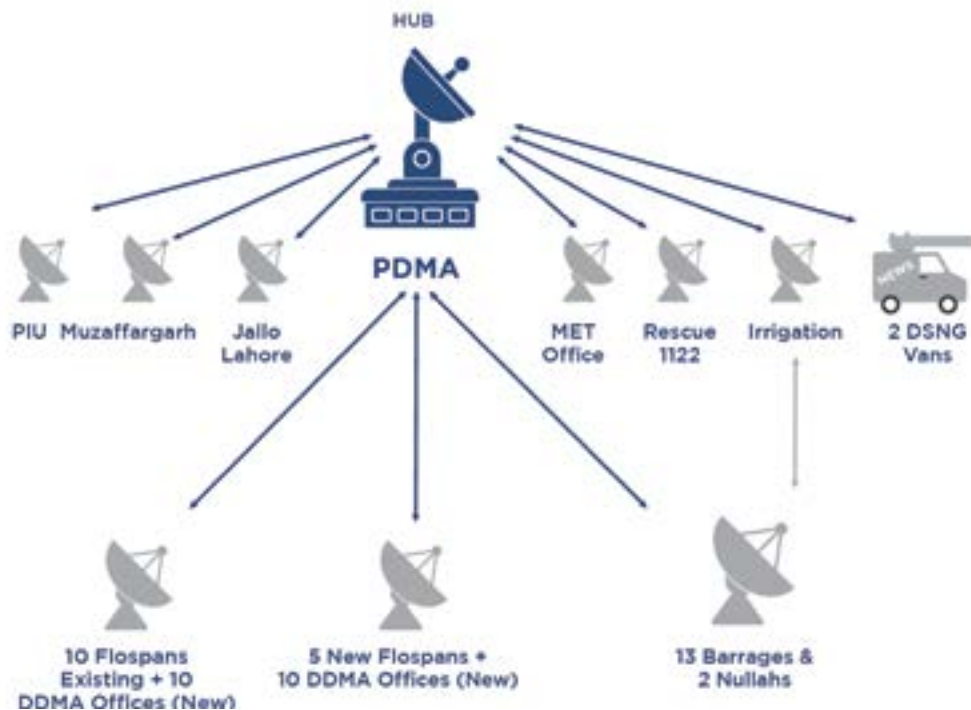
PDMA Punjab has Integrated Early Warning System (IEWS) through Satellite based interconnectivity in order to have a consolidated information system at one single platform with integration of different modules (Table 1.7).

TABLE 1.7: INTEGRATED EARLY WARNING SYSTEM (PDMA – IEWS)

- I. Satellite based Connectivity
- II. Multi Hazard Vulnerable Risk Assessment (MHVRA)
- III. Flood Scenarios Simulation through Digital Elevation
- IV. Cellular Level Broadcasting
- V. Mobile Communication Office
- VI. Digital Satellite News Gathering (DSNG) Vans
- VII. Early Warning Dissemination

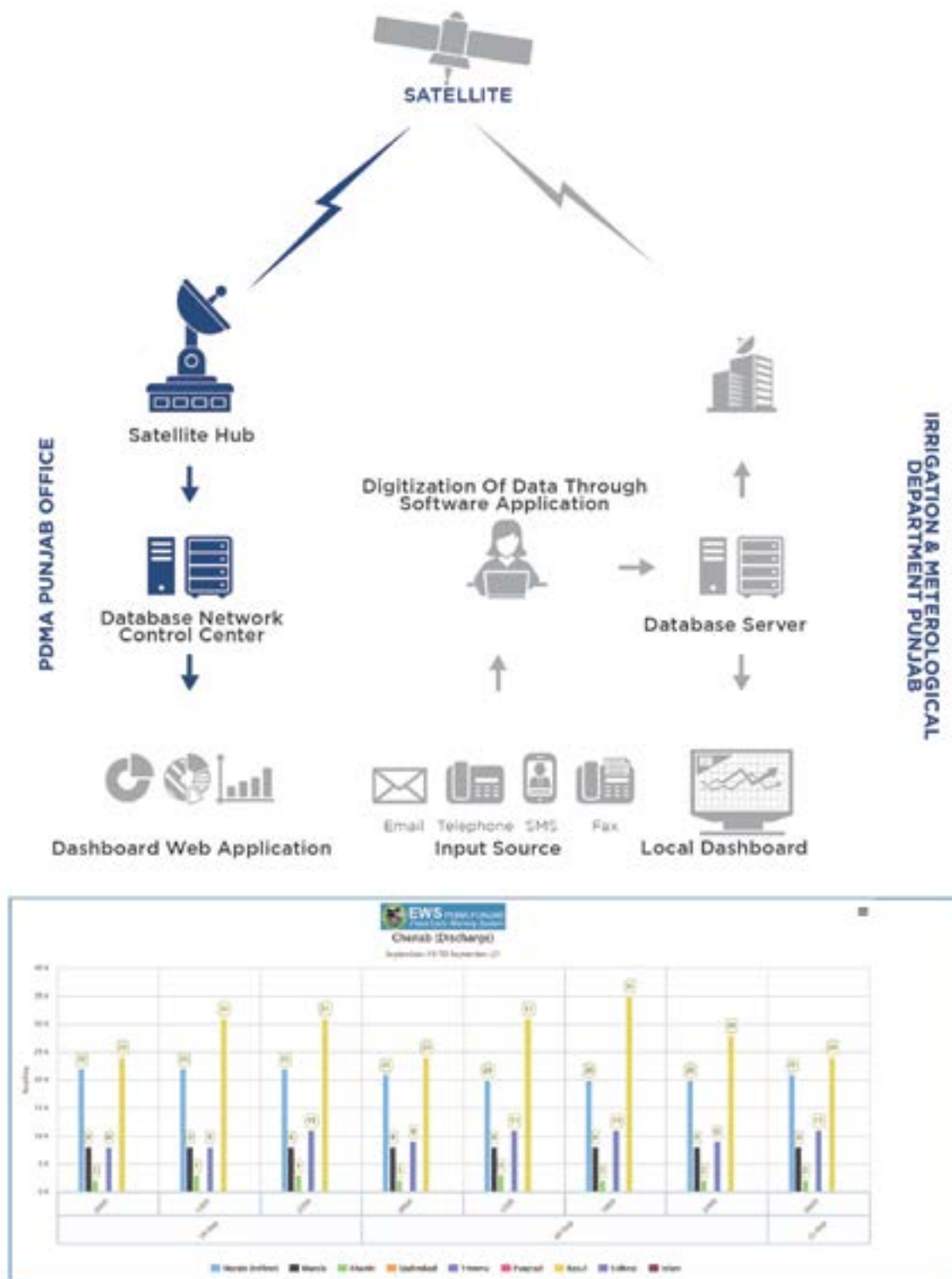
This state of the art system of Early Warning is developed primarily for 20 vulnerable districts in Punjab. This integrated system will bring together four major stakeholders i.e. Punjab Irrigation Department (PID), Punjab Emergency Service (Rescue 1122), Meteorological Department (Flood Forecasting Division), Lahore and PDMA (Provincial Disaster Management Authority) Punjab on one system in which real time information is shared with all departments. Moreover, two major PDMA Warehouses (HRF Lahore and Muzaffargarh) have been linked with the system and important Barrages / Headworks / Water Channels of PID are also in the process to be inter-connected (Figure 1.4).

Figure 1.4: Integrated Early Warning System



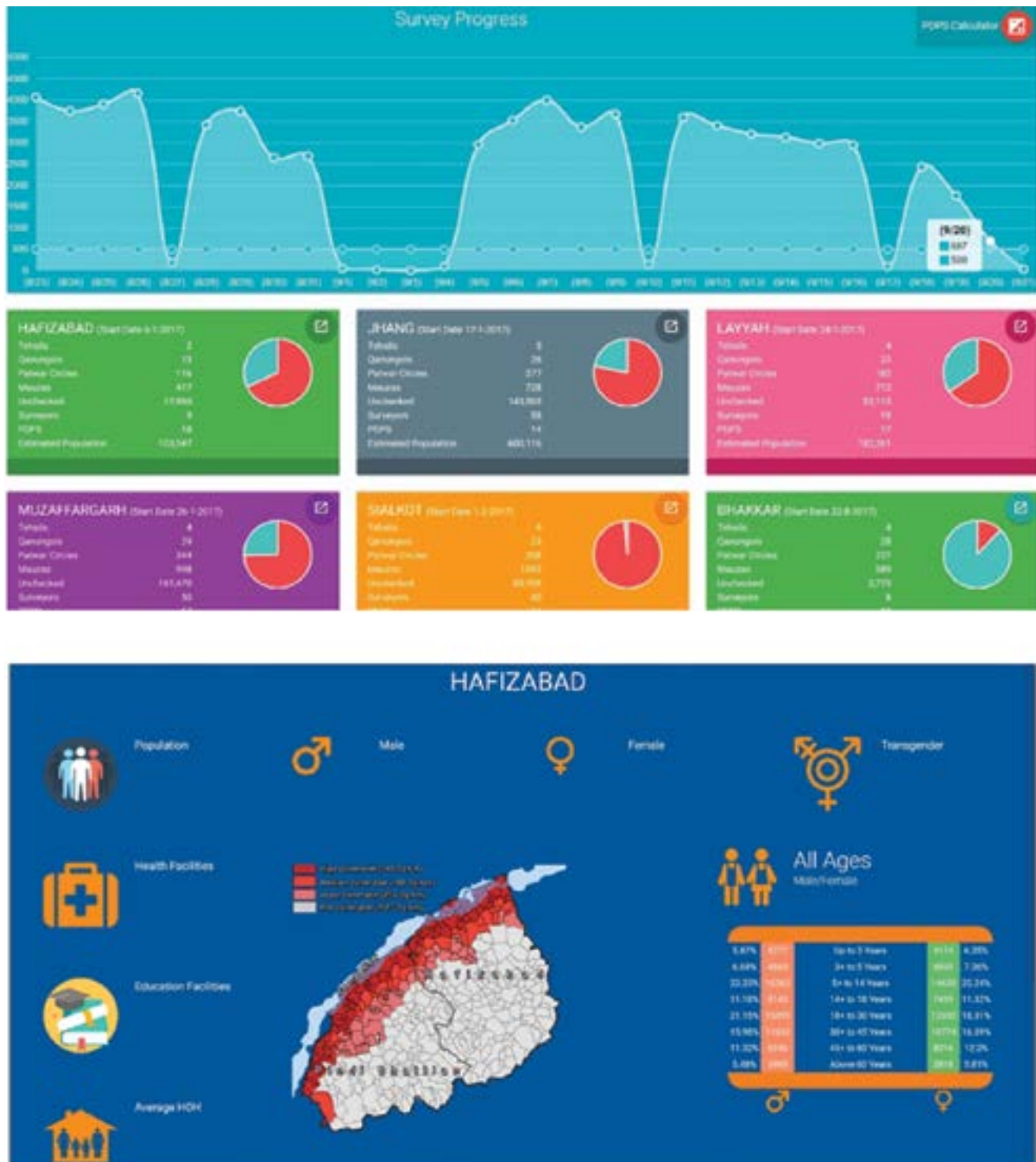
Every department has its own dashboard. Traditional fax and postal system has been replaced with on-line systems that display graphical analyses for timely decision support (Figure 1.5).

Figure 1.5: Early Warning And Response System



According to this system 1.2 Million people were to be GPS mapped. Out of this 0.9 Million people have already been mapped through Multi Hazard Vulnerable Risk Assessment (MHVRA). MHVRA surveys are being conducted in 20 vulnerable districts in Punjab to collect the demographic and socio-economic data of at risk population (Figure 1.6).

Figure 1.6: Multi Hazard Vulnerable Risk Assessment (MHVRA)



PDMA Punjab would have GPS location of 1.2 million people whereby PDMA Punjab will be able to send them emergency alerts, rescue them in time and can reach out to them with messages on risk reduction.

SMS sent out to people would also be sent out to DDMA's and Rescue 1122 for prompt response. PDMA Punjab has developed a GPS based Disaster Management System through which we simulate any scenario of floods and can be used for direct action in pre, during and post disaster scenarios. SUPARCO's assistance and digital elevation model would be used for technical studies on risk reduction.

The purpose of the project is to develop an enterprise GIS enabled hazard mapping and disaster risk management application. This application will handle multi hazard disaster in 20 most vulnerable districts of Punjab. The main objectives of the application are:

- Development of a data bank of disaster prone areas.
- District profiling of major hazards areas.
- Development of GIS enabled enterprise application for simulation of flood disaster in selected district.
- Capacity building of local staff for pre and post disaster rapid assessment and maintain related MIS.

A Cellular Level Broadcasting service is developed in coordination with PITB and PTA in which PDMA can reach out to active mobile phone users in a place as narrow as 1 square kilometer. This system would be most effective in sending alert messages, public service messages on disaster risks and reduction, early evacuation etc. Due to the development of this system, it can be used for Traffic diversion throughout Punjab.

A technologically advanced Mobile Communication Office has been developed in which there are working offices, accommodation, washroom and a seminar room (Figure 1.7).

Figure 1.7: Mobile Communication Office



This mobile office is equipped with live data, video feed and other facilities for direct link with the provincial control room. Mobile Communication Office is useful for:

- i. Stationing in remotest of areas for proper monitoring of ongoing relief and rescue operations.
- ii. Informing local public on key issues through LED displays (awareness messages).
- iii. Six (06) workstations equipped with latest Computers and printing facilities.
- iv. Conference/meeting room for 12-15 people.
- v. Accommodation facility for 4-5 people with washroom and kitchen for prolonged service in the field.
- vi. Video conferencing facility.
- vii. High Def cameras for monitoring of real time disaster situation.
- viii. Make announcements through loudspeakers.

PDMA has developed 2 DSNGs (Figure 1.8) to share data and video based messages with PDMA on a real time basis from remotest of areas. Real time feedback from remote affected areas is very important. PDMA Punjab has worked in areas as remote as Awaran, Balochistan. These DSNGs:

- i. Provide real time connectivity through satellite phone and direct satellite link.
- ii. Can create internet hotspots for local users, and relief workers in case of loss of telecommunication links.
- iii. Shed light on praise worthy governmental efforts that often go underreported.

A SMS and whatsapp system is developed that shares pertinent real time information with all the stakeholders alongwith daily Situation Reports (SITREPS).

Figure 1.8: DSNG Vans



1.5.2 INTEGRATED DISASTER MANAGEMENT SYSTEM (IDMS)

PDMA Punjab has developed an Integrated Disaster Management System which entails pre, during and post disaster management. The Pre-Disaster Management activities comprises of Preparedness, Mitigation, Coordination etc. During-Disaster Management activities comprises of Rescue, Recovery, Relief and Post-Disaster Management activities comprises of Rehabilitation and Reconstruction. The Integrated Disaster Management System (IDMS) comprises of modules to cater all aforementioned activities. (Table 1.8).

TABLE 1.8: INTEGRATED DISASTER MANAGEMENT SYSTEM (PDMA – IDMS)

I.	Establishment of Integrated Command, Control and Communication Center (Provincial Emergency Operations Center)
II.	Inventory Management System (IMS)
III.	Flood Relief Dashboard
IV.	Complaint Redressal Mechanism (UAN 1129)
V.	Compensation Payment Mechanism
VI.	Satellite based Tracking System

Figure 1.9: Control Room At PDMA Punjab



Portable trackers installed in trucks keep an eye on the movement of inventory. PDMA's IMS facilitates in:

- i. Monitoring of warehouses through CCTV.
- ii. Protection of food hampers, tents, field hospitals and other relief equipment.
- iii. Timely dispatch of relief items for effective response.
- iv. Central monitoring for efficient management.
- v. Tracking of dispatches through GPS devices installed in each truck to ensure protection against theft and timely delivery.
- vi. Digitization of Stock inventory for quick analysis and data sharing.

PDMA has developed a Flood Relief Dashboard with the help of PITB for real time monitoring of relief and rescue operations like:

- i. Fetching of real time information about relief and rescue.
- ii. Tracking of relief dispatches.
- iii. Tracking of end-disbursement of relief items to affectees on a real time basis.
- iv. Real time coordination with all DDMA's and line departments for effective relief and rescue.
- v. Sharing of inundation maps with concerned districts.
- vi. Issuance of travel advisories to general public.
- vii. Monitoring of weather conditions.
- viii. Depiction of inundation mauzas.
- ix. Listing of ongoing rescue operations.

Anyone from anywhere in Punjab can reach out to PDMA with any complaints. This UAN helpline number (1129) can be directly dialed from all over the province. Complaints recorded in the automated system are promptly addressed. Through this system:-

- i. Complaint is lodged, redressed with call back options.
- ii. Forwarded to concerned department.
- iii. A continuous follow-up is maintained.
- iv. A follow-up call is made to complainant regarding resolution of the complaint.

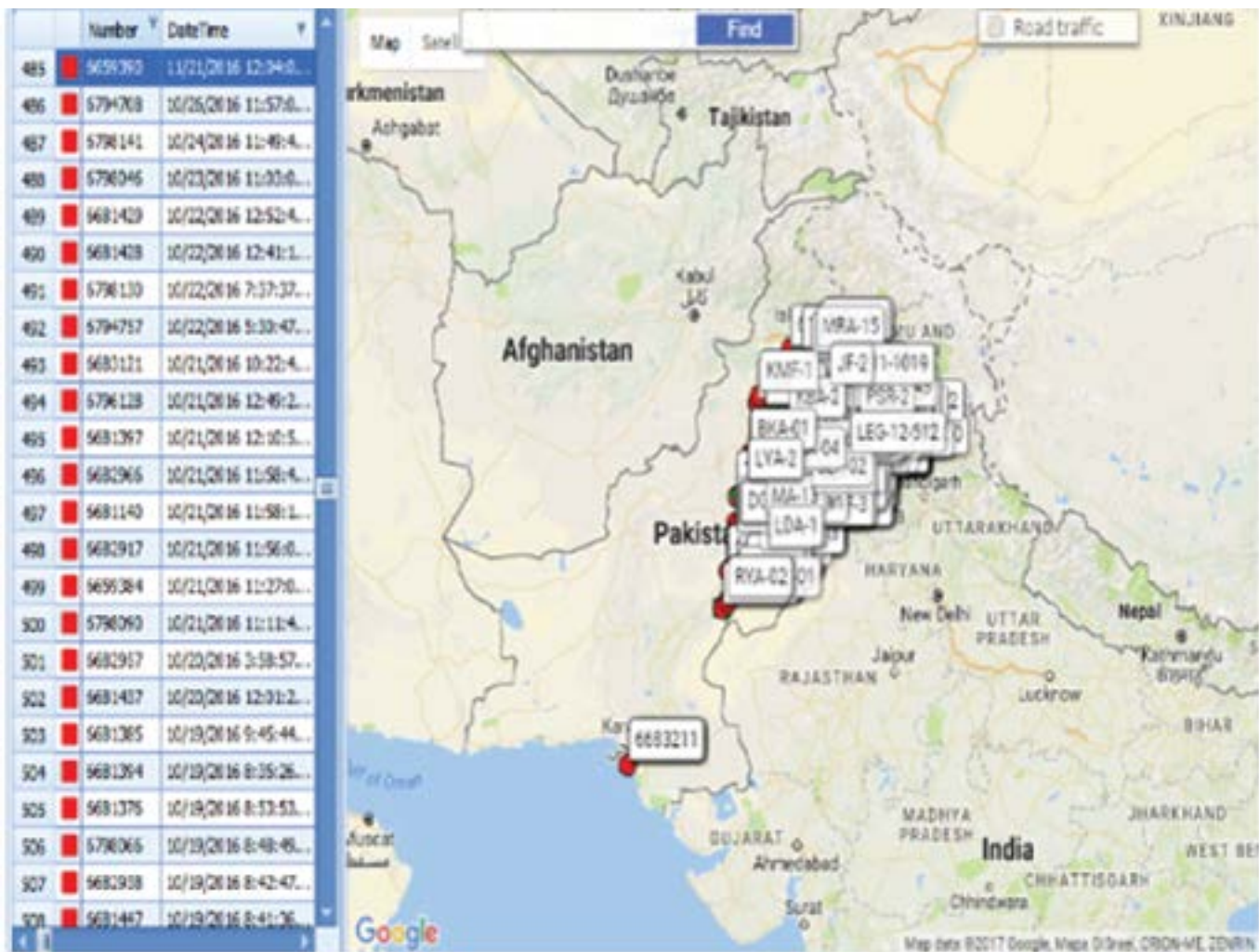
Compensation Payment Mechanism of PDMA Punjab has been strengthened by linking this system to an online Portal where data of losses and damages is updated. This is further strengthened by constituting various District Committees and providing guidelines. The assessment system has been linked with MHVRA data and MIRA Guidelines of NDMA.

PDMA Punjab has installed Satellite Based Trackers in all Rescue Boats / OBMs alongwith all Recues Vehicles (Ambulances and Fire Vehicles) of the Province for better monitoring of rescue and relief activities and for having real time data (Figure 1.11). The Satellite based Tracking System has salient features like web-based real time tracking, location monitoring, over speed alert, panic button, on demand pin-point location, battery status, geo-fencing etc.

Figure 1.11: Real Time Monitoring of Relief Items & Warehouse



Figure 1.12: Real Time Monitoring of Relief Items & Warehouse



1.5.3 DRR AND FIRE SAFETY

PDMA Punjab as one of its DRR (Disaster Risk Reduction) initiatives is determined to safeguard the lives and properties of the people of Punjab and has endeavored to minimize the risks involved in the incidences of fire cases alongwith curtailing fire incidences. As a corollary to it, a Notification No. 50-2017/20/Tech (Building) dated 23.02.2017, was issued with the approval of Provincial Disaster Management Authority whereby District Fire Safety Committees (DFSCs) have been constituted in all districts of Punjab for ensuring implementation of the recommendations of the Fire Safety Commission (FSC) constituted by the Hon'able Lahore High Court Lahore vide Order dated 01.03.2013 passed in Writ Petition No. 1619/2013.

District Fire Safety Committee in each District will visit all high rise buildings above 38 feet and ensure following Fire Safety Commission's recommendations (Figure 1.13). These Fire Safety Protocols need to be implemented by all Public Sector Buildings and Private Sector Hotels as well.

- I. Installation of external staircases
- II. Provision of Fire Doors opening outwards
- III. Provision of external or internal pressurized hydrant system
- IV. Installation of Fire Extinguishers
- V. Installation of Fire Alarm System
- VI. Provision of free and clear access for emergency vehicles / removal of obstruction
- VII. Preparation and display of emergency evacuation plan and emergency lighting system
- VIII. Constitution of Emergency Response Team with a dedicated Building Safety Manager

PDMA Punjab in order to facilitate District Fire Safety Committees has developed an Android based Fire Safety Assessment Application (FSAA) and its web component to conduct surveys of all high rise buildings above 38 feet alongwith public sector buildings and private sector hotels, (Figure 1.14).

Figure 1.13: Fire Safety Protocols

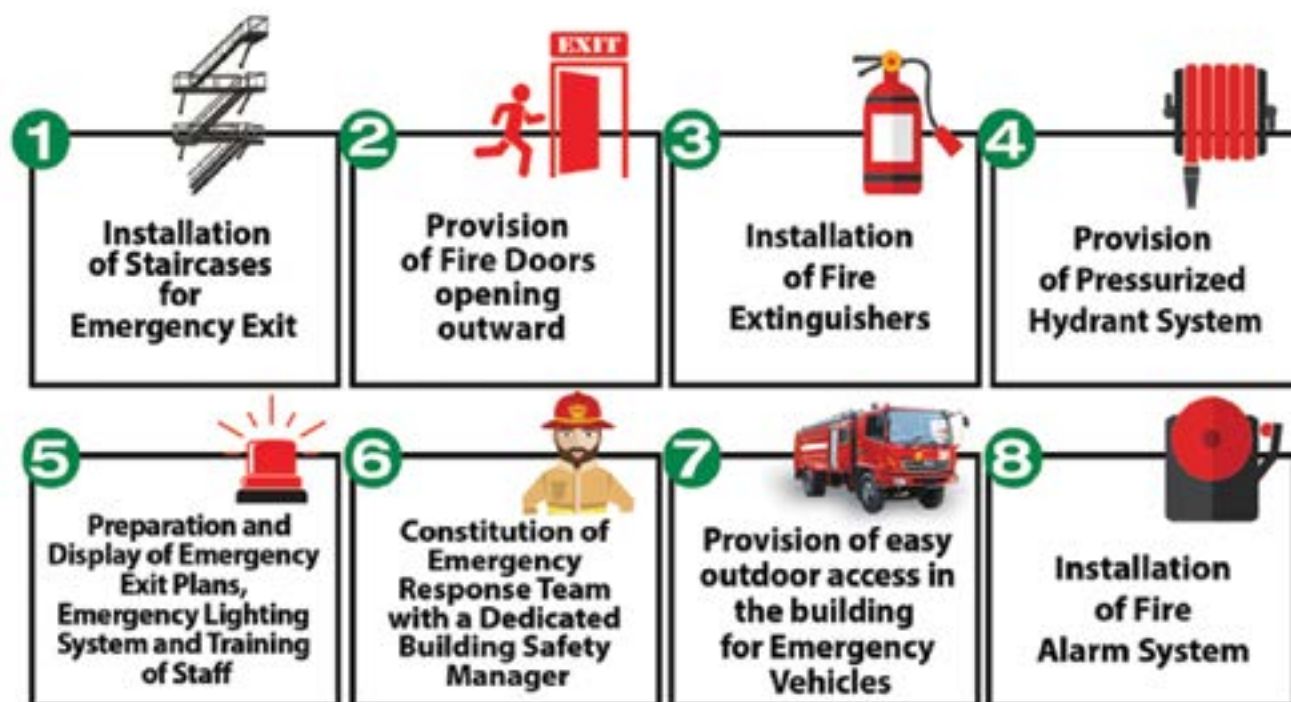
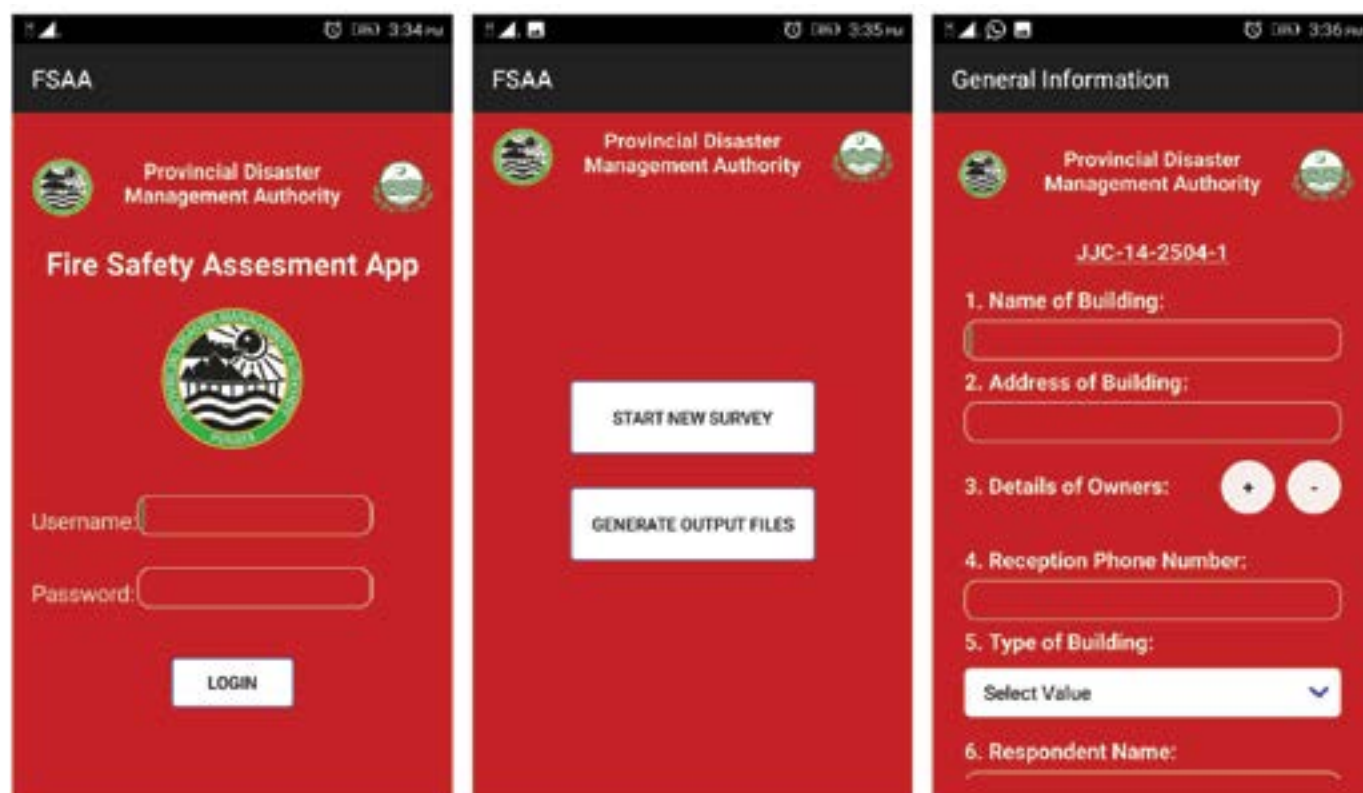


Figure 1.14: Fire Safety Assessment App



1.5.4 COMMUNITY EMERGENCY RESPONSE TRAINING (CERT)

Maximizing awareness and encouraging participation of communities in disaster preparedness activities to affect change at the community level is a challenge. PDMA Punjab as one of its CBDRM (Community Based Disaster Risk Management) initiative, is determined to contribute to the safety and security of communities in Punjab by imparting Emergency Response Training to the communities, so when in need, individuals are available to respond to a disaster. Community-based disaster preparedness (CBDP) is a process that seeks to develop and implement a locally appropriate and locally “owned” strategy for disaster preparedness and risk reduction.

PDMA Punjab in collaboration with Punjab Emergency Service (Rescue 1122) and World Food Program (WFP) has formulated a training program known as Community Emergency Response Training (CERT) for the individuals of the communities to make them prepared for emergencies and disasters. CERT is a four-day training program (Figure 1.15) consisting of following modules:-

1. Common Hazard and Community Response Group
 - Hazard types and classification
 - Community responders, limitations, role and responsibility
 - Scope of care of a community responder
 - Personal protective equipment
2. Securing Family and Preparing for Response
 - Important of family preparedness
 - Family disaster plan

- Preparation of Disaster kit / basic survival kit
- Phases of operations
- 3. First Aid and BLS (Building Collapse, Earthquake and Flood Emergencies)
 - Initial assessment
 - CPR
 - Management of foreign body airway obstruction (Choking)
 - Management of fractures
 - Management of soft tissue injuries
 - Emergency and non emergency moves (transportation)
 - Animal and Snake Bite Emergencies
 - Burns and Environmental Emergencies
- 4. Incident Command System and Triage
 - Incident command system
 - Community quick response sorting techniques
- 5. Dead Body Management
 - Handling of dead bodies
 - Identification of dead bodies
 - Storage of dead bodies
- 6. Fire Emergencies
 - Fire chemistry and classes of fire
 - Method of extinguishment
 - Use of portable fire extinguisher
 - Use of bucket brigade
- 7. Basic Search and Rescue (Building Collapse, Earthquake and Flood Emergencies)
 - Community light search and rescue
 - Common techniques in searching a structure
 - Lifting and stabilizing load
- 8. Water Emergencies (Flash Flood Emergencies)
 - Common water emergencies
 - Use of knots for joining and securing
 - Water rescue in shallow water

PDMA Punjab has linked CERT to the Sendai Framework for Disaster Risk Reduction 2015-30 and aims at imparting CERT training to One Million people in Punjab till 2030 to build Disaster Resilient Communities in Punjab.

Figure 1.15: PDMA - CERT



CH. 2

TYPES OF DISASTERS AND THEIR MANAGEMENT

2.1 FLOODS

2.1.1 CHARACTERISTICS OF FLOOD VULNERABILITY OF PUNJAB

Riverine floods, although, are characterized by heavy water flow but generally give enough cushion to authorities to vacate vulnerable and endangered areas as experienced in 2014. However, contrary to this Hill Torrents, are of less intensity, but create significant dent to lives and properties of people because their occurrence is sudden and water flow with gravitational pull play havoc and destroy everything which comes in its way. The western districts of the Province face the risk of flash floods originating in the western mountain ranges. Districts such as Rajanpur, DG Khan, Mianwali and Khushab are vulnerable to flash floods due to heavy rains. More than five million cusecs of water flowed into the Indus River from these districts during the floods of 2010. Following are the characteristics of flood and vulnerability of districts in Punjab:-

RIVERINE FLOODS (Multan, Muzaffargarh, Layyah, DG Khan, Jhang, Chiniot, Hafizabad, Mianwali, Jhelum, Mandibahudin, Kasur, Jhelum, Sialkot etc.)

HILL TORRENTS (Khushab, D G Khan, Rajanpur, Mianwali)

URBAN FLOODS(Lahore, Rawalpindi ,Sialkot, Gujranwala and Multan)

NULLAH/STREAMS (Sialkot, Narowal, Gujranwala, Sheikhpura, Gujrat, Rawalpindi etc.)

2.1.2 BRIEF HISTORY OF FLOODS IN PUNJAB

Punjab was hit by super flood in 2010 during monsoon season with devastating effect on 11 districts. Rehabilitation of displaced flood affectees and damaged, infrastructure took several months. This included the building of 22-Model Villages and completion of cash compensation program through “Watan Card.” This benefitted 622,092 in phase-I and 345,859 affectees in phase-II.

Although Punjab experienced floods over the years 2011-2013, but the intensity of these floods were not alarming. In 2014 Southern Nullahs and River Chenab swelled its banks affecting adjoining districts of Punjab; mainly districts of Jhang, Muzafargarh, and Multan. Successful early warning resulted into minimal losses of lives but huge financial losses (crops, houses, properties and social infrastructure) were incurred due to the floods in 2014. The rapidly changing weather patterns, climatic changes, urbanization and choking of natural ways have left more than half of the province at the risk of riverine floods and hill torrents. The second largest river is Chenab which remains deserted from Chiniot onward to Head Trimmu. It flows through heavily populated districts of Gujrat, Gujranwala, Sargodha, Jhang, Chiniot, Hafizabad and Multan hence poses great threat to adjoining population. Floods in 2014 have caused very heavy losses to lives and properties of adjoining population. River flow was recorded above .9 million cusec flow in 2014.

Figure 2.1: Districts Affected in Flood 2010

Flood 2010

- 7 districts severely affected by Indus
- 4 districts moderately affected by Jehlum & Chenab

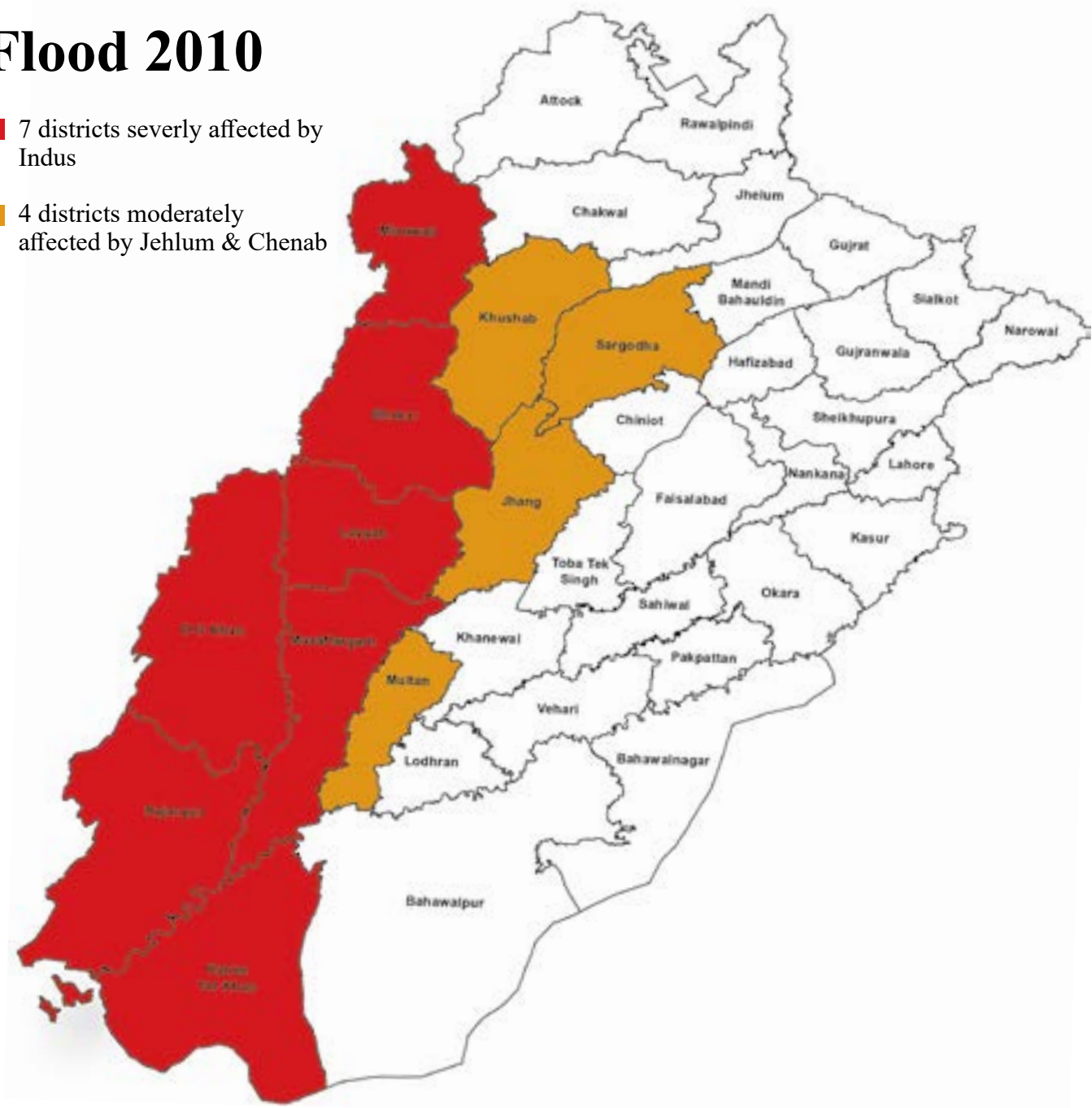
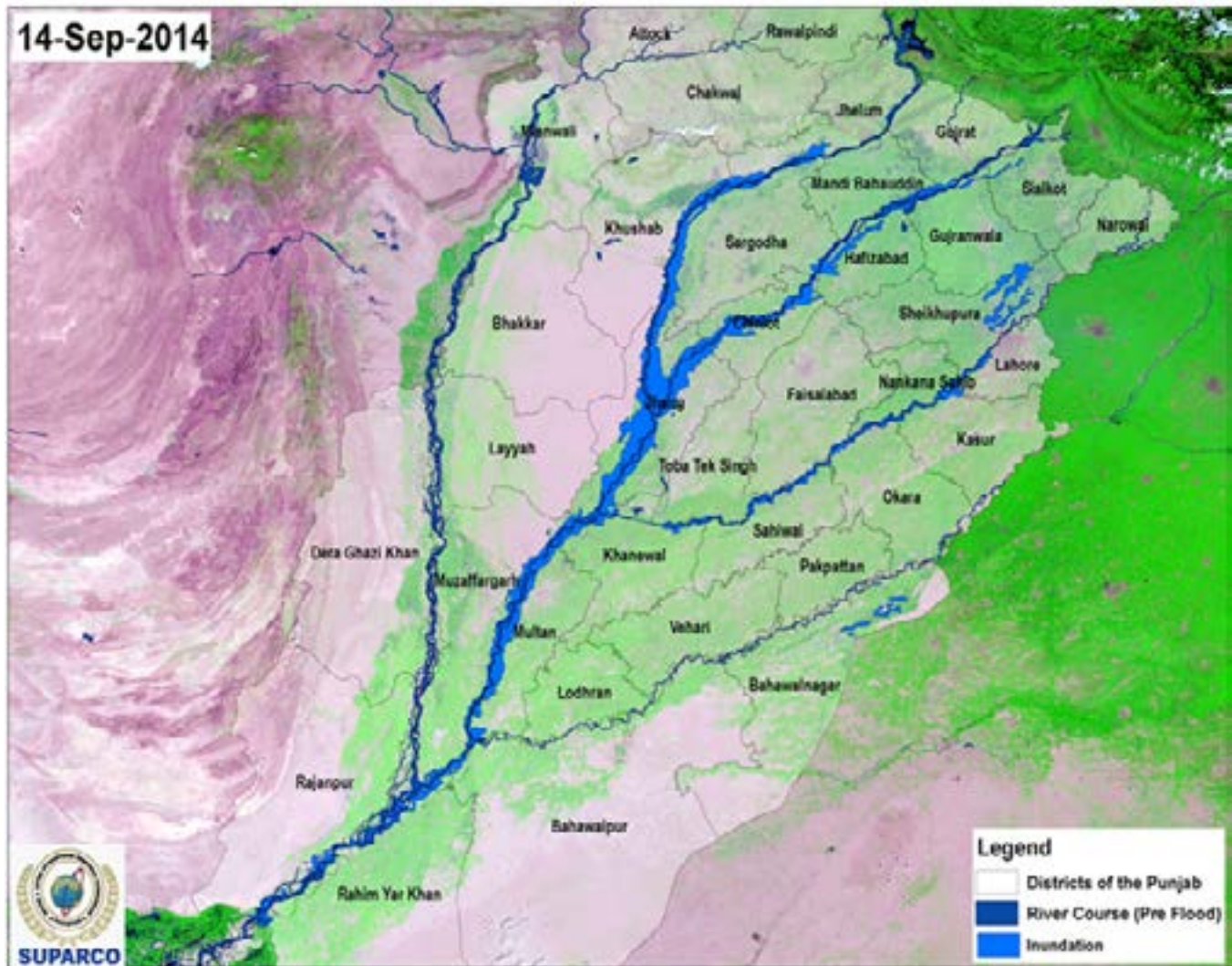
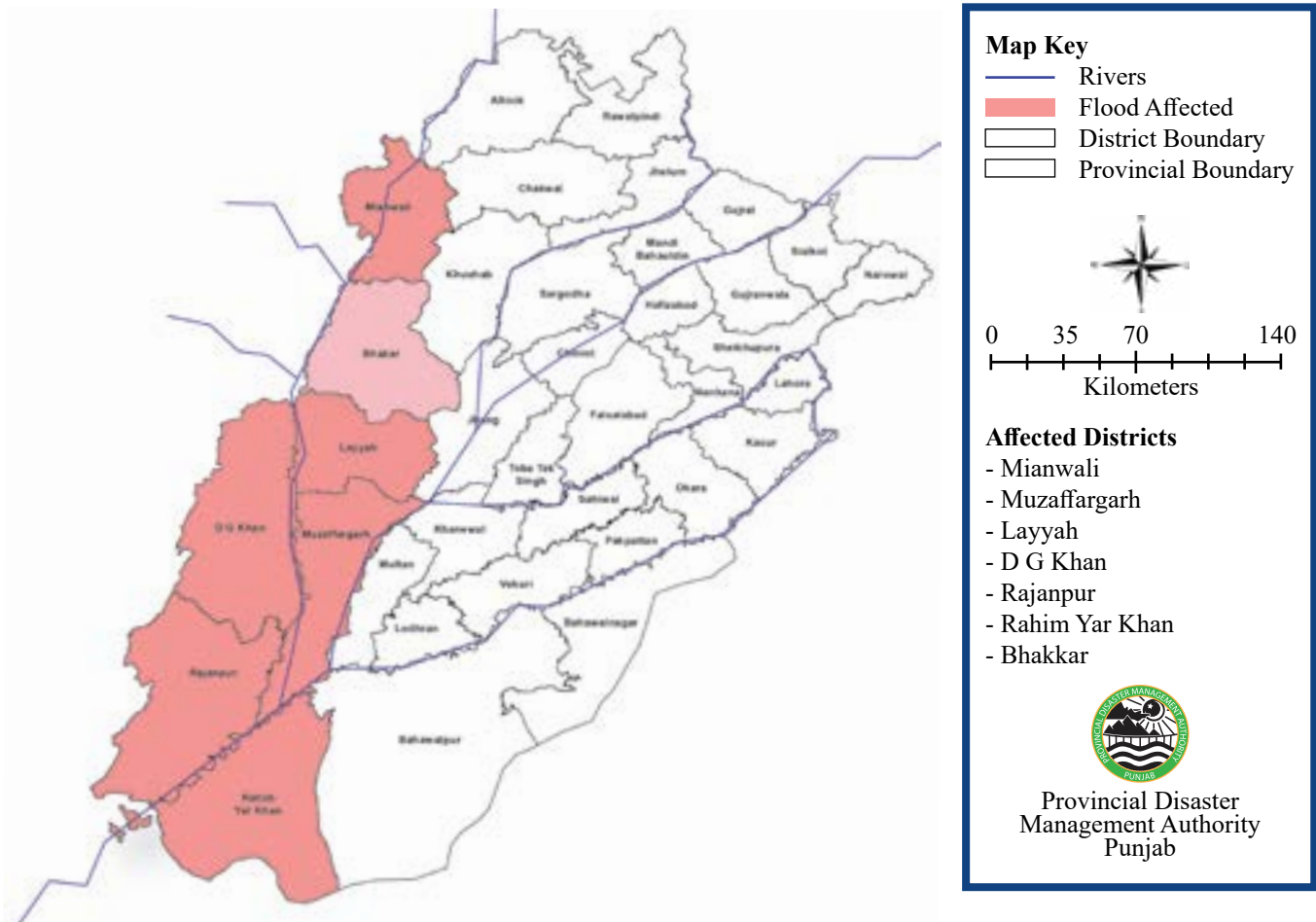


Figure 2.2: Rivers in September 2014 Flood



In 2014 an unprecedented high flood in the Chenab River posed a serious threat to Jhang, Muzaffargarh and Multan City causing huge losses in economic terms. Whereas loss of life was averted through an effective early warning but financial losses in terms of crop damage, infrastructure damage and damage to properties ran into billions of rupees.

Figure 2.3: Affected Districts in 2015 Flood



Another threat of sheet / shallow floods in the shape of numerous water channels flowing through the Pyramidal range tends to cause flooding across the populous districts of Gujranwala and Lahore division. Urban flooding is yet another hazard that Punjab has to be prepared for. The Lai Nullah in Rawalpindi poses a serious threat to the city as heavy rains along Margalla Hills can cause overflowing of this water channel beyond its capacity. Lahore, Gujranwala, Sialkot, Narowal, Sheikhupura are similar examples of population centers that face the risk of Urban Flooding due to various drain channels like Nullah Deg, Aik, Bhed, Basantar etc.

Incessant rains during July 2015 led to flooding in 15 districts of the Punjab province. PDMA, Government of Punjab in immediate response provided 55,600 tents, 174,750 food hampers, 82,000 mineral water bottles, and 35,150 mosquito nets, among others. For immediate Rescue and Relief Operations at Districts' level, an amount of PKR 588 million was disbursed to the District Coordination Officers of the concerned districts.

In 2015 apart from riverine flood flash, flooding also been observed in DG Khan, Rajanpur and Mianwali district due to torrential rains. Resultantly, heavy flash floods observed due to devastating overflowing of hill torrents. Namal Dam, Mianwali was also filled its maximum capacity and de-watering had to done to save the dam.

2.1.3 RIVERS OF THE PUNJAB

River Indus is the largest of all rivers in Pakistan and has the capacity to accommodate huge flows of water. Most of the Indus River is not in the vicinity of major urban settlements thus there is less threat to nearby population and properties. Being the main river, the Indus remains in flow throughout the year, keeping residents of adjoining areas vulnerable and conscious of the possibility of flooding. Keeping history of floods in view, all structures have also been designed accordingly and have been tested in 2010 Super Floods.

The eastern rivers i.e. the Ravi and Sutlej do not have heavy water flows due to the construction of dams upstream in India but whenever there are heavier than usual monsoon rains in the catchment areas, considerable discharges are released into the Pakistani territory causing floods, such as the floods in river Sutlej in 2013. Since these eastern rivers have negligible flows, nearby land owners have encroached upon and cultivated the area. Due to encroachment from nearby populations, even low intensity floods in these rivers causes severe damage to crops and properties.

River Jhelum flows throughout the year and its flow is regulated from Mangla Dam, hence, to some extent, becomes possible to avoid flood situation. Nevertheless, Jhelum overflowed in 2010 and 2014 due to delay in decision making and miscalculation. Situation with dam filled to its maximum limits and glacial melt activity coupled with heavy rain may lead to floods. The river Jhelum also merges in Chenab at Trimmu Head works in Jhang District and cumulatively they pose serious flood risk to the downstream regions. The first head works on this river are at Marala, which is immediately south of the Indian occupied territory of Jammu. Expectancy of damage to lives, properties and livelihood remains very high in case of flooding in eastern rivers.

Figure 2.4: Rivers Morphology in Punjab

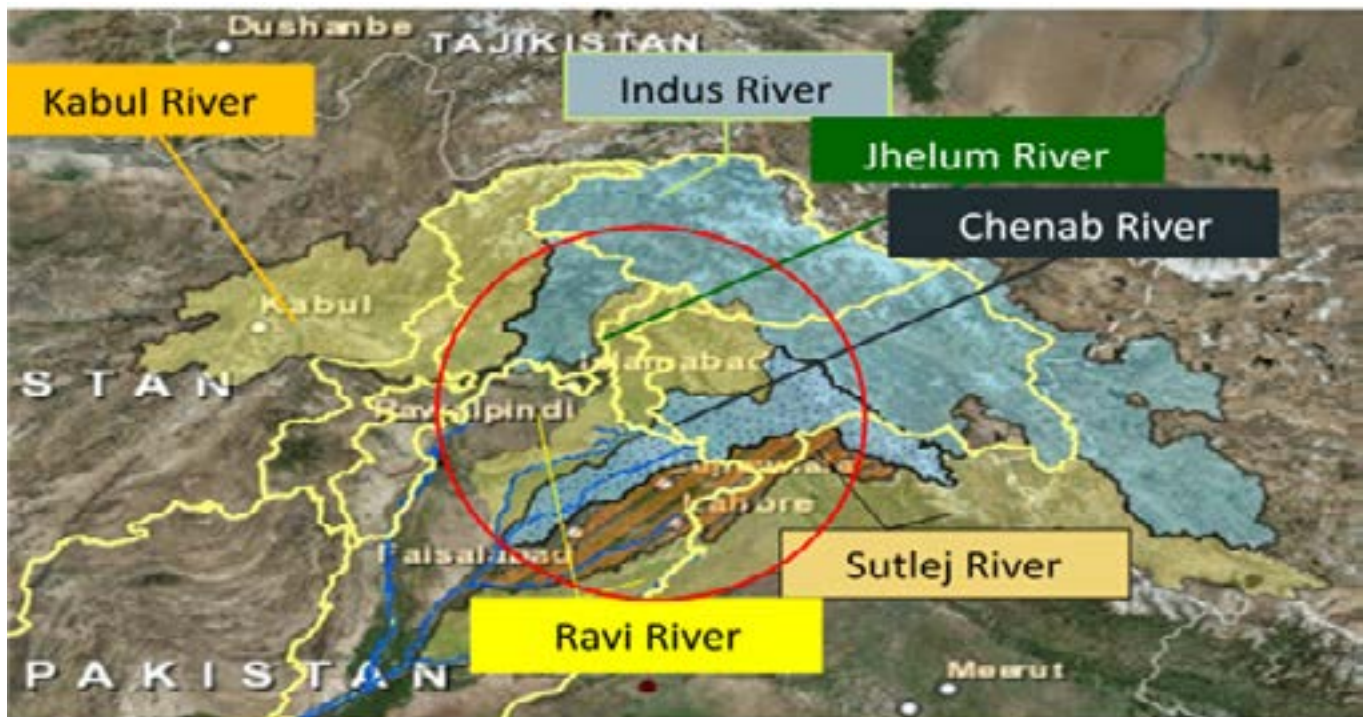


TABLE 2.1: 08 YEARS OF FLOOD HISTORY OF PUNJAB

YEARS	2010 (July)	2011 (Sep)	2012 (Sep)	2013 (Aug)	2014 (Sep)	2015 (July)	2016	2017
Cause Of Flooding	Indus, Chenab/Jhelum	Sutlej & Hill Torrents	Hill Torrents Rains in South	Chenab & Sutlej Nullahs	Jhelum/ Chenab Nullahs	Indus, Torrential Rains	No flood situation witnessed in 2016	No flood situation
No Of Districts Affected	11	12	3	9	16	8	-	26
No Of Villages Affected	1810	335	110	1628	3484	558	189	132*
Population Affected	6.2 m	.026 m	.389 m	.120 m	2.47 m	0.445	-	820
No Of Deaths	262	4	60	109	286	35	29	121**
Household Damage	353,141	1284	25,556	3,378	83,593	16,374	287	125
Area Affected	5.23 MA	.270 MA	1.96 MA	.195 MA	2.41 MA	0.341 MA	-	93450
Livestock Perished	3572	59	898	81	737	0	-	12
Expenditure by PDMA	34,135.42 m	345.75m	1,274.02m	663.44m	17,737.35m	1.65	-	-

*Due to river erosion.

** Due to heavy Rain in Lahore, Jhang, Bahawalnagar, Sahiwal, Sialkot, Faisalabad, Gujranwala.

2.2. DROUGHT MANAGEMENT

2.2.1 AN OVERVIEW

God has blessed Punjab Province with variety of soil types, ranging from Mountainous areas of Murree to deserts of Thal and Cholistan with peculiar set of environment. On one hand, most of the districts of Punjab are affected by flood disaster in Monsoon season and on other hand life is endangered due to drought spell in desert areas of Punjab. Although frequency of drought occurrence is not very high yet province faces cyclic process of drought almost once in a decade. Drought is long term phenomenon, it approaches slowly and gradually and same happens with recovery and rehabilitation process.

Canal network and road network has significantly brought down the impact of drought in Thal area which comprises of Khushab, Jhang, Mianwali, Bhakkar, Layyah and Muzaffargarh districts. Almost all farmers have put piece of their land under tube well irrigation and have secured their livestock by growing irrigated fodder along with rained cultivation. Apart from tube well farmers have installed hand pumps to provide ample to their livestock for drinking purposes. During drought, they feed their livestock with fodder raised by tube well irrigation supplementing with concentrated feed.

Drought normally affects the populations by creating water shortage for drinking of humans and animals and similarly affects natural vegetation as well as agricultural crops of that area resulting into shortage of food items.

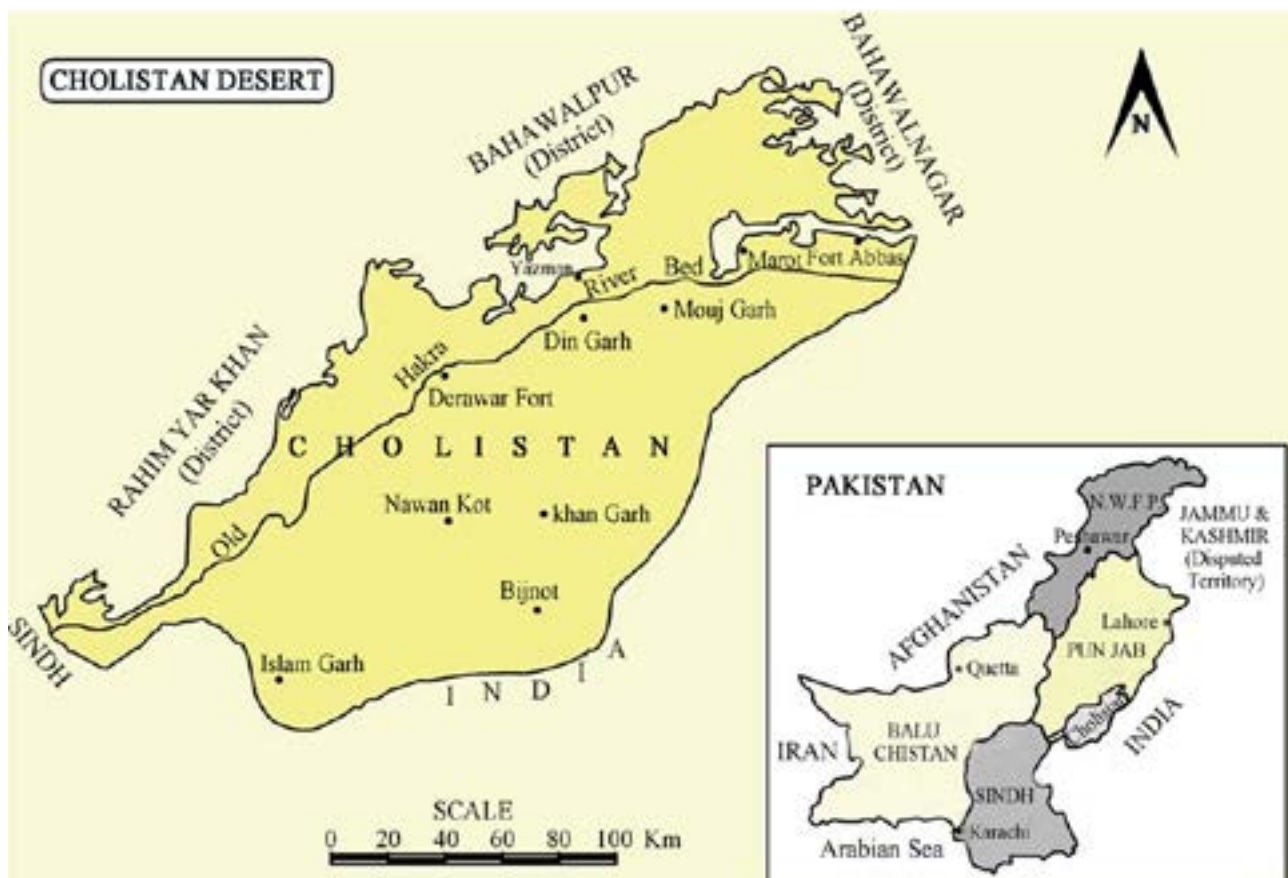
However, this general formula doesn't apply on our situation because Punjab has separate food basket and drought in deserts doesn't create significant dent on that in drought conditions too. Nevertheless, water scarcity affects natural vegetation of desert which is the sole source of feed for livestock. On the face of it, drought conditions create drinking water shortage to population of desert solely dependent on Tobas.

2.2.2 CHOLISTAN

There are two main desert (ranges) of Punjab; Thal and Cholistan. Both ranges are rain fed and get affected by drought badly. However, Thal, after the construction of canal network, has got plenty of underground sweet water through seepage from canal system which is being used for drinking as well as irrigation purposes. Most of the farmers have installed tube wells to irrigate their land leveled for general cropping and fodder cultivation.

However, Cholistan, which comprises of part of Rahim Yar Khan, Bahawalnagar and Bahawalpur districts, is still prone to drought disaster. There is likelihood of occurrence of drought which can impact human as well as animal lives. To understand phenomenon of drought and its impact on human and animal lives, we will have to understand edaphic and climatic factors of the area along with human interventions. Cholistan comprises of sandy soil with meager annual precipitation, rain water is collected in low lying areas of deserts (termed as Toba) and most of the population is settled near these Tobas. Tobas have been the sole source of drinking for human and livestock for centuries. Wind erosion is common phenomenon of Cholistan desert.

Figure 2.5: The Cholistan Desert



2.2.3 DROUGHT STAGES

Drought stage levels are set in proportion to remaining levels of water in Tobas (keeping expected season / time of precipitation in view).

TABLE 2.2: DROUGHT STAGES

STAGES	STATUS	LEVEL OF WATER	ACTION
STAGE-1	Moderate shortage	75% level as compared to normal year & time	Alert
STAGE-2	Severe shortage	50% level as compared to normal year & time	Watch
STAGE-3	Extreme shortage	25% level as compared to normal year & time	Warning
STAGE-4	Emergency shortage	<25% level as compared to normal year & time	Emergency

2.2.4 SOPs FOR DROUGHT MANAGEMENT

1. Prepare geo referred map of entire Cholistan with villages, canals, Tobas, roads, health facilities, veterinary facilities, water supply schemes and any other important facilities or points
2. Prepare list of families which are dependent on water supply or Toba with contact numbers along with members of family and number and type of animals owned by family
3. Prepare list of contact persons / social activists whom we can contact during disaster
4. Prepare list of focal persons of all concerned department with contact numbers
5. De-siltation of Tobas on regular basis to enhance capacity of Tobas
6. Periodic cleaning of water supply lines, storage tanks and ensure repair & maintenance of Machinery
7. Ensure water bowsers, tractor trollies and other drought emergency related machinery is in order and in functional condition
8. Water levels in Tobas are at par with desired levels at any particular time of the year
9. Prepare list of livestock owners with number of animals (sheep, goat, cow and camel etc.) and their geo location
10. Arrange necessary medicines, vaccine and concentrated feed for livestock
11. Establish camps for livestock with all facilities (water points and deworming facilities etc.) and mobilize livestock owners to bring their herds on designated Camps.
12. Impose ban on grazing in desert areas since it can lead to destruction of natural vegetation, moreover, drought itself changes the chemistry of fodder due to moisture shortage and some plants may become poisonous.
13. Increase frequency of meeting with livestock owners and influential of affected area

14. Issue guidelines for handling livestock during stages of drought
15. Drought Declaration will be issued by the concerned district administrations
16. Prepare Toba / Village wise list of drought affectees with levels / stages of drought with details
17. Launch orientation / awareness campaign for all contact persons / social activists
18. Notify District, Tehsil and Union Council level focal persons and make it public for the ease and better coordination
19. Mark / establish relief camps at nearest locations for population of various Tobas / villages
20. Intimate concerned population through contact persons and social activists to shift to their dedicated camp
21. Make special arrangements for worst hit area with all facilities for human and livestock
22. Prepare inventory lists of all necessary items, food and non-food, medicines etc.
23. Prepare projected lists of items required for stock pile Establish
24. Prepare / seek list of affected population of desert area under drought threat
25. Prepare special list of vulnerable population i.e. pregnant women, infants, old age people and disables
26. Prepare list of prevalent / potential to outspread diseases in drought condition
27. Prepare list of available medicines keeping drought disaster and related diseases in mind
28. Prepare list of medicines which are required to fill the gap and send request to concerned quarters for their purchase/availability

2.3 EARTHQUAKE MANAGEMENT

2.3.1 EARTHQUAKE IMPACT AND RISK ASSESSMENT

Community awareness, education and disaster resilience is integral to effective response arrangements, as response activities will be far more effective if the community has taken measures to minimize the impacts and consequences of earthquakes (e.g. property damage). Agencies that may be involved in response to an earthquake must have a Contingency Plan in place to ensure their continued ability to respond if a serious earthquake occurs. Furthermore, organizations that have a key role in the provision of lifeline services to the community also need business continuity plans in place so they are able to function to the best of their ability post-emergency.

Earthquakes, unlike many other natural hazards, have the potential to cause catastrophic losses. Although Punjab is popularly considered to have a low earthquake risk, a major earthquake could still occur under a heavily developed and populated area in Rawalpindi Division. The impact of such an earthquake could have widespread consequences throughout Murree and surroundings. An old fault line has re-activated and jolted Punjab in early 2016. Whilst there is a low probability that this event will occur in the foreseeable future, it is important to recognize the potential for such catastrophic impacts.

2.3.2 PROTECTION AND PRECAUTIONARY MEASURES

Although it is not possible to stop / decrease the likelihood of occurrence of Earthquake, however we can minimize or lessen the damage it can cause to the lives and properties of the public residents of earthquake hit area. Earthquake doesn't cause high damage as compared to damage caused by structural collapses. Hence we can save lives and properties of public if;

1. Certain standard which are helpful in bearing / withstanding earthquake shocks i.e. building codes are devised and their implementation is ensured in all kind of constructions in public and private sector
2. Electricity supply of earthquake hit area is made shock proof to desired level
3. Gas supply is made shock proof and ensured that supply is cut off as quickly as possible
4. Ensure alternate communication system in case main communication channel collapse during earthquake and restore alternate communication system if it is also affected
5. Ensure that food, nonfood reserves are sufficient and stock piled in earthquake prone area where there is probability of road transport cut off after earthquake shock e.g. Muzaffarabad and Northern areas etc.
6. Earthquake emergency related Rescue equipment and machinery are available and are in functional condition; moreover, periodic mock exercises have been conducted to test equipment, machinery. Also make sure that human resources equipped with desired skills required to deal with earthquake emergencies

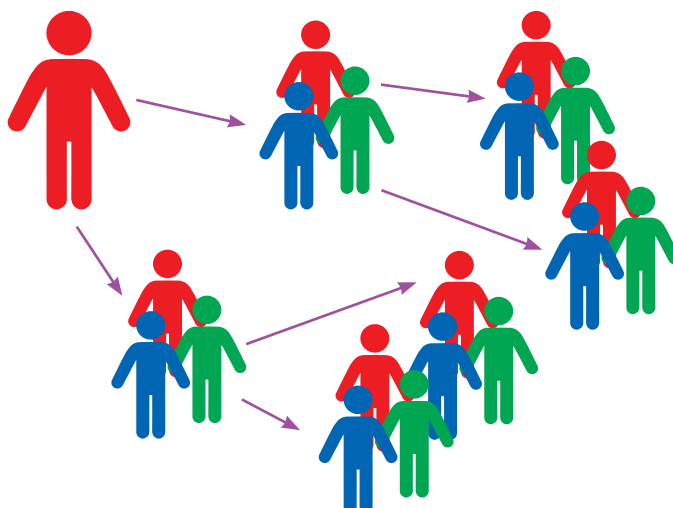
Figure 2.6: Precautionary Measures During Earthquake



2.4 EPIDEMICS

2.4.1 WHAT IS AN EPIDEMIC?

Epidemic is defined as an outbreak or unusually high occurrence of a disease or illness in a population or area. It is an outbreak of a disease or illness that spreads rapidly among individuals in an area or population at the same time. There is less likelihood of epidemic in Punjab Province because Government of Punjab is stressing hard on 100 % vaccination of communicable diseases. Regular National Immunization Days (NID) are being observed properly since Government of Punjab and health department are according due priority to these NIDs. International Institutions are monitoring these activities very closely at all levels. Provincial Government has sensitized District Administrations and has passed on very strict instructions for 100 % vaccination of communicable diseases.



COMMUNICABLE DISEASES SPREAD THROUGH;

1. Drinking water e.g. diarrhea
2. Aerial transmission e.g. influenza
3. Through carrier / vector e.g. dengue and malaria etc.
4. Spread through several means / contact e.g. HIV AIDS, hepatitis etc.

2.4.2 CONTROL OF COMMUNICABLE DISEASES

Following steps need to be taken, in order to control communicable diseases.

District administration in collaboration with health department;

1. Should observe all NIDs
2. Should ensure 100% vaccination of target groups
3. Should immediately report any unusual communicable disease witnessed in any facility or during vaccination operations
4. District Administration and health department both should report unusual communicable diseases witnessed in any area
5. District Administrations should ensure periodic cleanliness and treatment of water supply lines
6. District Administration should ensure periodic checking of water supply lines
7. Health Department should ensure periodic sampling and laboratory checks of water sample taken from various schemes and locations

Following steps should be taken, in case any disease is widespread at any place;

1. Prepare map of affected population with details of patients with age and sex
2. Cancel leaves of all concerned staff (health, district administration staff etc.)
3. Nominate and notify focal persons of all concerned departments at various levels (District, Tehsil and Union Council)
4. Convene regular meetings of all concerned departments to remain current and updated and plan for future course of action

5. Notify hospital for treatment of communicable disease and make necessary arrangements for the patients of that particular disease
6. In case of communicable disease, the treatment area in the hospital should be cordoned off
7. Orientate media and use it for awareness of general public. Media should be used positively to help convey message to masses
8. Prepare fliers, in easy and understandable language, to orientate general public about disease and precautionary measures which can be taken by them to control disease

2.5 CHEMICAL DISASTER MANAGEMENT

2.5.1 CHEMICAL DISASTER

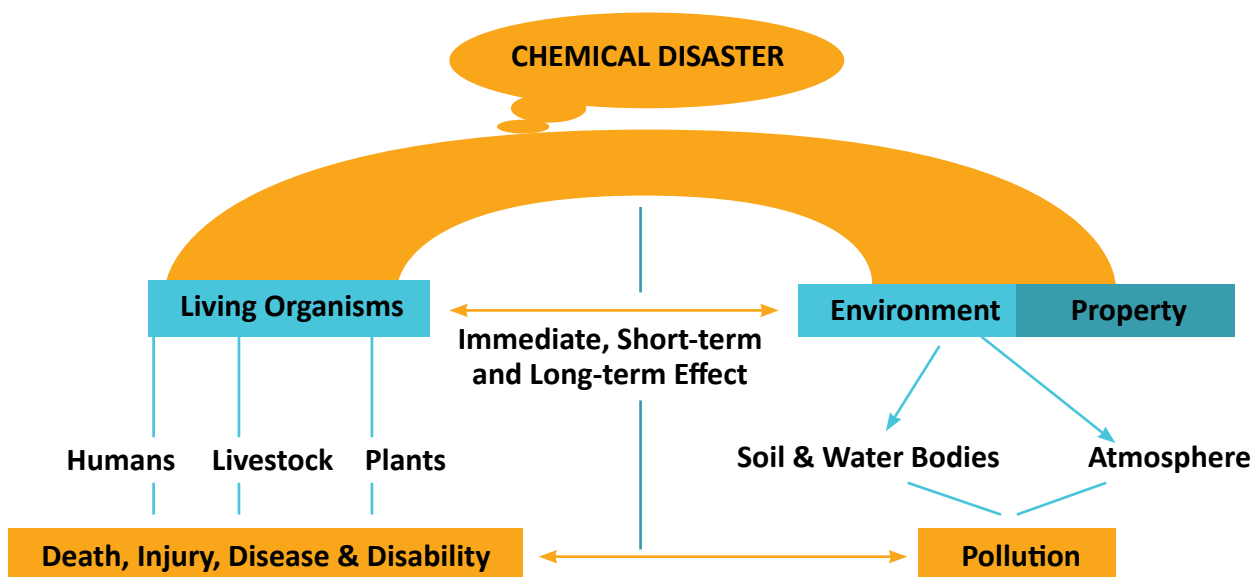
Chemical Incident is defined as an uncontrolled release of a chemical from its containment that either threatens to, or does, expose people to a chemical hazard. Such an incident could occur accidentally or deliberately

Normally, as per government policy, industrial parks are established away from main cities preferable along with main roads where transport and other facilities required for industry are available. However, with the increased population growth, urban settlements have expanded horizontally engulfing industrial states into urban city centers. It is not uncommon to find industrial units which have been surrounded by residential colonies. This is causing manifold damages to the communities in vicinity. Omissions, effluents and gases, are continuously polluting air and ground aquifer. In addition to this, there remains likelihood of explosion or leakage of chemicals causing damage to lives and livelihood of the people. Such incidents worsen situation subsequently by catching fire and causing explosions. Chemical disaster cause manifold damages.

1. Chemical disaster may directly cause damage to worker through contact
2. Chemicals may cause damage to communities living in vicinity
3. Chemical may trigger explosions or fire which can further trigger something new
4. Chemical disaster may cause psychological trauma in addition to above narrated damages

Owners of industrial units / factories should be made responsible for handling On-Site emergencies through their own means and for that they should be made responsible to maintain an adequate level of preparedness in accordance with their industry related chemicals. For off-site PDMA and DDMA's should maintain desired level of preparedness.

Figure 2.7: Sequence of Events in Case of Chemical Disaster



2.5.2 MANAGEMENT OF CHEMICAL DISASTERS – SOPs FOR DDMA

1. DDMA should prepare geo referred Map of Industrial parks and individual industrial unit dealing with chemicals with potential to harm human lives directly or indirectly
2. Prepare list of chemical wise industries / factories
3. Impart training to Rescue 1122, District Administration and health service providers to deal with chemical disasters
4. Conduct regular periodic mock exercises to test equipment and machinery
5. Legal framework / Regulatory provision for management of chemicals should be framed and its implementation should be ensured
6. Integration of safety risk assessment provisions in all environmental appraisal and site clearance tools/process and developmental planning process
7. Emphasis on health risk assessment of product and process to be given adequate significance and practice
8. A web based Chemical Accident Information and Reporting System developed by provincial Government with the support of PITB for creating data base on chemical accidents
9. Need for a common Information Management System on hazardous chemicals, location/ mapping, processes, storage, handling and a knowledge center to be created as a pool of relevant information resources including failure data, reports, accident analysis records, etc.
10. Regular meetings of the Provincial, District and Local Crisis Groups need to be organized to review the off-site emergency plan, monitor post-accident situation, status etc. and forward the meeting reports along with follow-up actions to the nodal ministry
11. Public awareness especially with regard to chemical hazards needs more emphasis
12. DDMA to conduct at least one full scale mock drill for chemical accident every year and forward a report with strength and weakness of the plan
13. Need for Information exchange on chemical accident management-including antidotes, root cause of accident, material safety datasheets, risk reduction measures, etc.
14. Chemical Risk Assessment to be an integral part of the Environmental impact assessment and land-use planning, and detailed geo-sensitivity based site risk assessment to be given importance in clearance process

2.6 FIRE DISASTERS

2.6.1 FIRE DISASTER MANAGEMENT

Fires are the accidents which occur most frequently, whose causes are the most diverse and which require intervention methods and techniques adapted to the conditions and needs of each incident. Depending on the type of fire (nature of the material on fire), meteorological conditions (wind) and the effectiveness of the intervention, material damage can be limited (a single car, building or production or storage warehouse installation), or affect wide areas (forest or agricultural fires, hydrocarbons, gas or other highly flammable products, storage or piping installations).



2.6.2 CLASSES OF FIRE AND TYPES OF FIRE EXTINGUISHERS

Generally fire is divided into four classes:-

- | | |
|-------------------|---|
| 1. Class A | These are fires that involve some solid material like clothes, paper, junk heap and wood etc. |
| 2. Class B | These are fires that involve liquid materials like, petrol, gasoline, diesel, oil etc. |
| 3. Class C | These are fires that involve electrical elements |
| 4. Class D | These are fires those involve metal |

Figure 2.8: Types of Fire Extinguishers



It is important to know about the classes of fires because fire-extinguishers are classified and marked based on the type of fire on which they would be effective. So in case of fire, you first want to know the class of fire, so that they can use the right extinguishers. If wrong extinguisher is used, the result could be fatal in certain cases. Following are different types of extinguishers:-

WATER BASED

These are most effective on Class A fires. On Class B fires, these are mostly ineffective. This is because, oil/petrol/gasoline etc. being lighter than water continues to float over water, and, thus, it continues to burn. In some cases, use of water based extinguishers on Class B fires could turn out to be injurious also. That is because, as water is thrown over burning fuel, the force due to water-stream could cause burning petrol etc. to be sputtered, and, this hot fuel could cause injury, if it falls on somebody.

On Class C fires, these should never be used. Use of water based extinguishers on Class C fires would surely be fatal. That is because, water is a good conductor of electricity, and, the electric current flows through the water-jet directly into the hands of the person who is holding the water-hose, resulting in immediate electrocution.

FOAM BASED

These are used mostly on Class B fires. It can also be used on Class A fires. These should never be used on Class C fires. The main constituent of foam being water – it can easily prove to be fatal on a Class C fire.

CO₂ BASED

These are mostly used on Class C fires. It can also be used on Class A and Class B fires. These kind of extinguishers might also be used to extinguish fires in computers, costly electronic equipment etc. where, usage of water etc. could cause damage to the equipment. The biggest advantage of these kinds of extinguishers is that it does not leave any residue, smell or mess.

DRY CHEMICAL BASED

These are most commonly used type of extinguishers. It can be used on Class A, B and C fire. Hence, it is also known as ABC type extinguisher. Its impact on Class D fire could be varied, depending on the type of metal being burnt.

2.6.3 PREVENTIVE AND PROTECTIVE MEASURES

1. Fires can spread more or less rapidly depending on their causes, the nature of the material and goods alight, the fire prevention installations (automatic sprinklers), meteorological conditions, the ways the population is informed and the initiative it shows, as well as the speed and efficiency of the intervening services and of their fire-fighting equipment. The means of intervention brought into coordinated action at the local, Tehsil or District Level vary according to the seriousness of the incident. The time factor and the quality of the intervention are of primary importance. Fire-fighting requires that substantial means be available at the right time and place and brought into action as quickly as possible. The chances of success are greater when the fire has just broken out. Following general precautionary measures should be taken:
2. Keep matches and lighters out of the reach of children and teach them caution around fires and inflammable objects.
3. Do not keep inflammable products (petrol, gas containers, paper, cloth, etc.) near any source of heat.
4. Keep in mind the instructions relating to fires, find out about protection measures, know the whereabouts of gas and electricity main switches and learn to use domestic fire-fighting equipment (extinguishers, fire reels and hoses, nozzles ,etc.);

5. Do not smoke, do not light fires, do not switch on electrical equipment or machinery likely to make sparks when handling, or pouring inflammable or toxic products (petrol, gas, etc.), or if they are leaking.
6. Know the telephone numbers of the Rescue 1122, Civil Defense, Edhi, nearby health facility and police.

2.6.4 PREVENTION AND PRECAUTIONARY MEASURES

For DDMAs in case of fire including forest fire

1. Mark and prepare Geo referred map of all potentially risk prone building and points, with special reference to fire
2. TMA should ensure that there is no encroachment on the way to potential fire prone buildings which can hinder firefighting operations.
3. Ensure that all building / potential vulnerable points have escape route for residents / workers in case of fire emergency
4. Ensure that fire extinguishing equipment is available and in functional condition and all security / firefighting teams know their location
5. Ensure that security staff / firefighting staff is well trained and physical and medically fit to combat fire in case of emergency
6. Ensure that residents / workers of building and flash points are aware of emergency SOPs (to be followed in emergency situation) and know escape routes
7. Ensure that contact number of all firefighting agencies are displayed at prominent place in building and at flash points with necessary instructions are to be followed during emergency situation
8. Operationalize Control for information of general public and for coordination among stakeholders
9. Ensure that all equipment and material required to combat fire with rescue department is ready, in order, functional and firefighting team is trained and all members are physically and medically fit to combat fire
10. Ensure that health department has made all necessary arrangements (inclusive of human resources, equipment and medicines etc.) to deal with burn cases resulting from fire break out
11. Ensure that mock drills have regularly been conducted and firefighters are aware of the potential threats of fire emergency in their area (involving all stakeholders Rescue, Health, DDMA's etc.)
12. DDMA should convene periodic meeting with all owners of such building periodically and inspection teams should visit all building, flash points (petrol and gasoline station) to ensure that all precautionary measures have been taken and fire extinguish equipment is available (functional) and staff is trained
13. All DDMA with forest plantations in respective should also include forest department in all meetings and operations mentioned above

2.7 HEAT WAVE

2.7.1 WHAT IS HEAT WAVE?

Heat wave is a result of phenomenon which occurs on sea and terrestrial areas, near coastal belt, jointly. Heat wave take place when low pressure develops on the ocean for long time and high pressure develops simultaneously on terrestrial areas. This phenomenon, if remains for long time, will keep sky clear with hot days. Normally, the temperature rises and remains above normal continuously causing sustained heat wave. Heat wave rises temperature up to 5C for prolonged period, causing cut off in breeze. This high pressure and clear skies make air warmer and stagnant over the region for many days.

Considerable deforestation and rapid urbanization had also contributed to the severity of the heat by generating Urban Heat Island Effect. Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces, for example, are significantly cooler than the temperatures of un-shaded materials. In 2015 Karachi faced a severe heat wave which caused several casualties.

As a result of projected climate change, more frequent and powerful heat waves can be expected in the future.2.7.2



2.7.2 PRECAUTIONARY MEASURES

In view of the above-mentioned conclusions, the situation demands a comprehensive strategy to cope with disastrous heat waves. It is recommended that an effective early warning system for heat waves as discussed above may be established in the country on a priority basis. For this purpose a detailed survey should be conducted to locate and map the heat wave prone areas in the country with all vulnerabilities, risks and possible scenarios. Following precautionary measures should be taken:-

1. Capacity of individuals and communities may be built to respond to the heat stress during heat waves by raising heat-health awareness campaigns in the province before the onset of a heat waves season.
2. Orientation of school and college students of heat wave prone area on disaster due to different natural hazards and their management may be done at least once in a year.

3. Tree plantation should immediately be initiated in the city on emergency basis.
4. The heat island effect can be counteracted slightly by using white or reflective materials to build houses, roofs, pavements and roads, thus increasing the overall albedo of the city.
5. Green roofs are another method of decreasing the urban heat island effect. Green roof is the practice of having vegetation on a roof such as having trees or a garden. The plants that are on the roof increase the albedo and decrease the urban heat island effect.
6. Proper town planning rules and regulations may be observed for all on-going and in future townships.
7. “Cool Centers” facilitated with drinking water, fans, air etc. maybe established at public places and along the main avenues.

Heat/Sun Stroke is a preventable condition. Following Common preventive measures are recommended which should be taken by the health authorities:-

1. Public should be educated through awareness messages to drink plenty of water while limiting time in different sunlight in hot/humid weather or in places with high environmental temperatures, avoid becoming dehydrated and to refrain from vigorous physical activities in hot humid weather.
2. Public should be made aware of early signs/symptoms of dehydration and subsequent evolving signs and symptoms of heat/sun stroke such as muscle cramps, nausea, vomiting, light-headedness and even heart palpitations.
3. The person working under the sun should prevent dehydration and heat stroke by taking time out of such drinking plenty of water/fluids. The patients should avoid use of caffeine containing soft drinks / tea, which may exacerbate dehydration.

Figure 2.9: Tips to Beat the Heat



2.8 RODENT CONTROL

2.8.1 RODENT INFESTATION

Rodents are small mammals of the order Rodentia, which are characterized by a single pair of unremittingly growing incisors in each of the upper and lower jaws. About forty percent of all mammal species are rodents; they are found in vast numbers on all continents except Antarctica. They are the most diversified mammalian and live in a variety of terrestrial habitats, including human-made environments. Well-known rodents include mice, rats, squirrels, porcupines.

People are very concerned about rodent control – and with good reason. Rodents consume and contaminate food with their fur, urine and feces. Rat burrowing causes streets and structures to collapse. Their constant gnawing (continuous chewing or biting) damages property. This has caused power outages, Internet disconnect, computer crashes, fires and human deaths. It is estimated that 25 percent of all fires attributed to “unknown causes” are probably started by rodents gnawing on gas lines, electrical wiring and matches.

Rodents also carry diseases. A few centuries ago, 25 million people died of “black plague” – a disease carried by rats and transmitted to humans by fleas. Today, plague still occurs, even in this country, along with other rodent-borne diseases including leptospirosis, hantavirus pulmonary syndrome, rat bite fever and food-borne diseases. Rat bites threaten human health.

Rat bite incidents are reported every year, however, the frequency of incidents has significantly increased in the recent past, especially hundreds of rat bite cases were reported in Peshawar alone as result of mushroom growth of rats in 2015-16.



2.8.2 MANAGING RODENTS

Long-term rodent control for urban areas combines sanitation, exclusion and, when necessary, the use of traps and baits.

SANITATION:

Rodent control begins with sanitation. While rodents find warmth and shelter inside structures, food is their first reason for living in and around buildings (urban settlements). Thus, every effort should be made to eliminate rodent food sources in and around building. Foods should be kept in sealed containers made of materials difficult

for rodents to chew through, such as metal and hard plastic. Trash also should be stored in tightly sealed containers including trash cans and dumpsters with lids.

Drain openings should be securely plugged. Trash removal should be regular and frequent enough to keep rodents from relying on food trashes. Water management is also important for rat control. Don't let water stand in sinks overnight. And keep lids on toilets – rodents have been known to drink water, and even urine, from toilets, and can enter structures by swimming pipes and emerging from toilets.

EXCLUSION:

Exclusion is the best method to control rodents which refers to a state where all opening are plugged, doors are kept closed, wall are painted up to 3.5 ft. height, making it impossible for the rodent enter into any building. All holes in toilets and washrooms are covered with metallic nets (net less than .25 inch size). Exclusion is considered first line of defense.

Metal kick plates attached to doors can prevent from rodents gnawing on them. Exterior vents and floor drains should be covered with screens or metallic nets grates sufficient to exclude rodents, and spaces around drains should be filled with cement.

TRAPPING:

Traps are most useful against mice, because mice tend to be curious and rats suspicious. For mouse control in public buildings, snap traps can be used. Correct use of snap traps begins with proper placement. Along walls (rodents tend to run along walls), snap traps should be placed perpendicular to the wall, with the trigger end against the wall. Although un-baited snap traps catch rodents but they work best when baited with food attractive to rodents i.e. bait with meats, fruit or sweets. For mice, cotton balls and dental floss are also attractive as nesting materials.

BAITING:

Baiting rodents with rodenticides is another effective means of control. Often, baiting is the most efficient and timely way to eliminate large numbers of rodents. The main disadvantage is that rodenticides are toxicants and must be used carefully to avoid harming people, pets and other non-target animals. As with all pesticides, precautions (and associated risks) must be taken when using rodenticides. Rats may ignore newly-placed rodent bait and traps for days or even weeks, especially if other food continues to be routinely available to them. The curious mouse may accept bait more readily; but to be effective, many closely-spaced bait offerings must be placed due to the mouse's smaller home range.



2.9 SMOG

The year 2017 was a particularly challenging year due to adverse effects of climate change being felt throughout Punjab. During early November 2017, several parts of Punjab, particularly the city of Lahore, were affected by severe smog that was hazardous to the health of the citizens. Citizens of Lahore are complaining of breathing difficulties and irritable eyes as a blanket of thick smog took over. Visibility plunged to less than 20 metres leading the citizens to wear face masks to help with breathing. Low visibility caused closure of portions of Motorway at midnight, besides hampering vehicular movement on almost the entire National Highway.

Excessive Pollution has made the atmosphere suffocating even indoors, putting even housewives and children at huge risk of getting eye, skin, lungs, ear, nose and throat complications. In places near irrigation canals, rice paddies and rivers where there is more moisture available, the fog gets even thicker.

During these difficult times, the PDMA issued weather and smog alerts asking the public to take reasonable precautions against smog to protect themselves and their families. Public was asked to keep windows closed for offices and residences and even vehicles. It was also advised that the public wear masks at all times and undertake frequent eye washes to guard against the risk of infections.



CH. 3

THE PROVINCIAL FLOOD CONTINGENCY PLAN 2018

This chapter contains four sections. First section deals with Monsoon weather forecast. Second section elaborates the role of PDMA Punjab in dealing with the flood emergencies. This section describes in detail the preparedness activities alongwith timelines, vulnerable districts, pre-flood arrangements, mock exercises and etc. Third section deals with the disaster response functions like rescue, relief and rehabilitation efforts and the Fourth section deals with the roles and responsibilities of various stakeholders in case of any imminent flood emergency.


3.1 MONSOON WEATHER FORECAST 2018

In northern Pakistan, rainfall is expected to remain “normal to slightly above normal of long term average” during first half of the season, and below normal during second half of the season. In southern Pakistan, “near normal of long term average” during first half of the season, and largely below normal during the second half.

The prevailing temperatures trending Pakistan indicates high probability of a few “Extreme rainfall events” in Punjab and KP, and “GLOF events” in Gilgit-Baltistan/Chitral regions during monsoon season. Monsoon is very likely to onset few days earlier in Pakistan during this year.

Pakistan Meteorological Department has predicted the following seasonal forecast for Monsoon 2018. (Table 3.1)

TABLE 3.1: MONSOON WEATHER FORECAST 2018

 National Weather Forecasting Centre Pakistan Meteorological Department 	
Dated: June 08, 2018	
<u>Outlook for Summer Monsoon (July – Sep) 2018</u>	
Keeping in view the global, regional and local meteorological indicators, the seasonal outlook for Pakistan summer monsoon 2018 has been prepared. It is evident from the model output that monsoon is expected to be more active during the first half than the second one. However, the most likely salient features are stated below:	
<ul style="list-style-type: none">- In northern Pakistan, rainfall is expected to remain “normal to slightly above normal of long term average” during first half of the season, and below normal during second half.- In southern Pakistan, rainfall is expected to remain “near normal of long term average” during first half of the season, and largely below normal during the second half.- The prevailing temperatures trend in Pakistan indicates high probability of few “Extreme rainfall events” in Punjab, and “GLOF events” in Gilgit-Baltistan/Chitral regions during monsoon season.	
In the light of “Outlook of Summer Monsoon 2018” and already prevailing water shortage in the country, the water managers should take measures for water storages accordingly.	
Note: Due to prevailing uncertainties in climate system dynamics the monsoon seasonal forecast will be updated on monthly basis during the first week of each month.	
Spokesperson	

3.2 ROLE OF PDMA PUNJAB

3.2.1 OVERVIEW

The Provincial Disaster Management Authority (PDMA) was constituted under the National Disaster Management Act in 2010 and specializes in mitigation, preparedness and an organized response to a disaster. The most important role of PDMA lies in providing a platform for all provincial departments to come together and strategize management and response to disasters and calamities. PDMA also acts as the coordinating authority, which articulates the coordination mechanism between key provincial departments including Rescue 1122, Civil Defense, District Governments, Punjab Irrigation Department and Punjab Police for immediate rescue and rehabilitation operations. In case of a disaster, PDMA not only oversees search, rescue and evacuation of the affected people, but also takes concrete measures to provide immediate relief, early recovery and long-term rehabilitation to them. In case of emergencies, PDMA works closely with District Administration to organize initial and subsequent assessment of disaster affected areas, and determine the course of action to ensure long-term rehabilitation of the affected population.

3.2.2 PDMA PUNJAB AND DISASTER MANAGEMENT

Provincial Disaster Management Authority (PDMA) Punjab is a coordinating body that provides a platform to all departments and is responsible for spearheading the Government response to a disaster.

PDMA Punjab is converting itself from responsive / reactive mode to pro-active mode for disaster management. PDMA team is committed to perform its leading role in all phases of disaster management like preparedness, mitigation, early-warnings, rescue, response, relief, recovery and rehabilitation. PDMA in its endeavor to raise the bar of preparedness is carrying out necessary tasks to shift from reactive mode to proactive mode which includes lot of work conceptualization, brainstorming, orientation of key stakeholders, information gathering, automation, integration of early warning system etc. and chalking out policies accordingly. Some of the functions of PDMA Punjab in managing disasters is as under:-

1. PDMA coordinates with all stakeholders during disasters and acts as hub between district, provincial and national stakeholders in accordance with the levels of disasters.
2. PDMA remains ready to provide additional rescue and relief resources to DDMA's when and where demanded by DDMA i.e. Boats, OBMs, Life Jackets, Tents, Mats, Mosquito nets, Food hampers, Bailey Bridges and De-watering pumps. Similarly helicopters of the Pak Armed forces and other government agencies will be employed when needed to carry out rescue and relief operations.
3. PDMA operationalizes Command and Control Center (Control Room) at PDMA Lahore office which operates 24/7 from 15th June to 15th October during flood season and in case of other disasters as well to provide an alternate mean of communication to all DDMA's and other agencies if routine communication system collapses in any disaster.
4. PDMA prepares consolidated inventory list of materials, equipment, gadgets and machinery available with all stakeholders with their location, related to disaster response and shares with all DDMA's to help channelize them where and whenever required.
5. PDMA makes necessary arrangements for the provision of food, shelters, drinking water, medical supplies, and non-food items to the affected districts and areas to complement the efforts of the District Administration.

6. PDMA requests NDMA or other federal and International agencies to jump in, when it is deemed necessary and provides platform to all National and International stakeholders in case of exceptional disaster.
7. PDMA also helps DDMA's to carry out damage assessment surveys after disaster by devising loss assessment tools, set procedures, and orientate field survey teams. It ensures that set procedures and processes are properly followed in preparation of loss assessment etc. and implements policies of rehabilitation announced by provincial / federal governments.

3.2.3 ALERTNESS LEVELS

Four levels of alertness have been established by PDMA Punjab depicted in Figure 4.1.

TABLE 3.2: ALERTNESS LEVELS

<p>Level-D</p> <p>(Disaster threat is perceptible)</p>	<p>DDMA shall conduct monthly meetings besides at least 2 mock exercises as per DDMP, well in time, to make the concerned officers/officials understand their role and responsibility for better coordination and testing of rescue and relief equipment. DDMA shall also ensure the physical presence of concerned staff deputed and availability of equipment/resources for all designated vulnerable sites within given time frame during disaster. Vulnerable site's inspections and necessary works/action shall be carried out as mitigation measures.</p>
<p>Level-C</p> <p>(Alert Warning issued but likelihood of occurrence is less than 100%)</p>	<p>Activities to be undertaken in level D+</p> <p>DDMA shall issue “alert” to all concerned for the vulnerable area. DDMA and LDMA (tehsil level) control rooms be made operational 24/7 and ensure availability of all required (available and additional) resources for on call mobilization and monitor the situation 6 hourly. Only DCO and DPO shall grant leave according to the situation.</p>
<p>Level-B</p> <p>(High Alert) (Disaster threat is imminent)</p>	<p>Activities to be undertaken in level C+</p> <p>DDMA shall respond to the emergency immediately and shall carry out rescue and relief operation as defined in DDMP and shall continuously monitor the situation. Resources of adjoining districts shall be mobilized and Army may be called keeping in view the magnitude of the disaster.</p>
<p>Level-A</p> <p>(Red Alert) (Disaster is materialized)</p>	<p>Activities to be undertaken in level B+</p> <p>DDMA shall respond to the emergency immediately and shall carry out rescue and relief operation as defined in DDMP and shall continuously monitor the situation. Resources of adjoining districts shall be mobilized and Army may be called keeping in view the magnitude of the disaster.</p>

3.2.4 THE VULNERABLE DISTRICTS IN PUNJAB

Almost all districts of the province are prone to flood disaster since most of them touch river system or nullahs. Districts have been categorized into 3 groups on the basis of likelihood of occurrence and intensity of flood disaster i.e. A, B and C.

TABLE 3.3: VULNERABLE DISTRICTS IN PUNJAB

District	Risk	District	Risk	District	Risk	District	Risk
Bhakkar	A	Jhelum	A	Chiniot	B	Lodhran	C
D.G. Khan	A	RY Khan	A	Attock	B	Khushab	C
Multan	A	Rajanpur	A	Bahawalnagar	B	Okara	C
Mianwali	A	Gujranwala	A	Khanewal	B	Rawalpindi	C
Muzaffargarh	A	Lahore	B	Sheikhupura	B	Sargodha	C
Layyah	A	Gujrat	B	Sahiwal	B	TT Singh	C
Jhang	A	Sialkot	B	Faisalabad	C	Vehari	C
MB Din	A	Hafizabad	B	Chakwal	C	Pakpattan	C
Narowal	A	Nankana	B	Kasur	C	Bahawalpur	C
High Risk	A	Medium Risk	B	Low Risk	C		

3.2.5 ACTIVITY TIME FRAME FOR 2018

Following activity time frame has been charted out by PDMA Punjab for 2018:-

TABLE 3.4: ACTIVITY TIME FRAME 2018

Sr. No.	Activities	Jan	Feb	Mar	Apr
1	Provincial Disaster Response Plan				
2	District Disaster Response Plan				
3	Departmental Contingency Plans				
4	Mock Exercises				
5	DDMA Meetings	All 36 DDMA's; Every Month			
6	Rationalization and Pre-positioning of Stock				
7	Constitution of District Inspection Committees				All DDMA's 10th April
8	TPV of District Flood Fighting Equipment				
9	Pre-Qualification of Vendors for Food Hampers and Transportation				
10	Operationalization of Control Rooms (PEOC + DEOC)				
11	Establishment of Flood Forecasting Center				
12	Monsoon Weather Forecast Release				
13	Inspection of Flood Protection Bunds			PDMA + All DDMA's + PID Starts in March and Ends (with submission of Inspection	
14	Inspection of Dangerous Buildings	PDMA + All DDMA's (District and Divisional Committees).			
15	Removal of Encroachments				
16	De-Silting of Nullahs, Water and Sewerage Channels, Drainage Systems, Bridges etc.			All DDMA's + 05 WASAs + Metropolitan Corporation	
17	Readiness Certificates vis-à-vis Functionality of flood fighting equipment, Human Resource Training and Deployment, De-silting works				

May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	PDMA 15th June						
All DDMA's 15th May							
All Stakeholder Departments 15th May							
PDMA + All DDMA's + Rescue 1122 1st Mock Exercise in May; 2nd Mock Exercise in June							
	PDMA + All DDMA's 15th June						
All DDMA's 30th May							
PDMA + All DDMA's 2nd May							
	PDMA + All DDMA's 15th June to 15th October						
	PDMA + PMD (FFD) Lahore + PID 15th June to 15th October						
	PMD 1st Week of June						
Reports) at 10th May							
Year round activity. Reports vis-à-vis Monsoon Season to be submitted by 15th April							
All DDMA's + PID + Punjab Police. 10th May							
Municipal Committees / District Councils. Monsoon related de-silting starts in March and ends at 15th June							
	All Commissioners + All DDMA's + LG & CD, C&W, Housing, Irrigation, Primary Healthcare and Specialized Healthcare Departments						

3.2.6 MEETINGS AND COORDINATION MECHANISM

Government of Punjab gives high priority to the protection of lives, livelihood and properties of people, hence disaster management remains on top of government's priority agenda points. Chief Minister Punjab has constituted a **Cabinet Committee on Floods** to look after the matters of disaster management. Cabinet Committee is chaired by Mr. Nadeem Kamran, Minister for Planning and Development Punjab. Cabinet Committee members led by senior ministers and provincial secretaries pay visit to flood prone districts and hold consultation meeting for pre flood preparations. Cabinet Committee also holds meetings with stakeholders and monitors implementation of Cabinet Committee decision at district level. In 2018, so far three Cabinet Committee Meetings have been held

1. 1st Cabinet Committee Meeting (13.04.2018)
2. 2nd Cabinet Committee Meeting (10.05.2018)
3. 3rd Cabinet Committee Meeting (20.05.2018)

3.2.7 PRE-FLOOD ARRANGEMENTS

1. All departments and district administrations have prepared & submitted their respective contingency plans outlining details of human resources their roles and responsibilities, machinery, equipment, gadgets, with their location and condition.
2. All DDMA's have conducted Mock Exercises in first week of May 2017 and mock exercises will be conducted in 1st week of June 2017.
3. Necessary guidelines have been provided to all DDMA's and their members regarding Camp Management, Disaster Risk Reduction.
4. Districts have been registered, scrutinized and short listed for the supply of food and non-food item during emergency situation. PDMA's management has taken procurement process from emergency mode to normal mode which will save resources and ensure timely supply of needed items.
5. All departments to ensure sufficient stock of materials and machinery at vulnerable points.
6. Communication & Works department has prepared Communication Contingency Plan to keep road / bridge links functional in flood season as per SOPs and have identified alternate routes in case main routes get disconnected.
7. DDMA's in consultation with Food Department have identified sites for safe storage of food stocks and have installed a mechanism in place to shift this stock to desired points when and where needed.
8. Both Health and Livestock departments have ensured that they will provide medicines & vaccines in flood prone areas / camps according to the severity of the disaster.
9. Regular coordination meetings of Pak Army, NDMA, PDMA and Rescue 1122 teams are being held for better and well synchronised response to disasters.
10. Finance Department has been sensitised and Chief Minister of Punjab has passed special instructions to meet stakeholders' demand of funds and Finance Department has ensured that department will keep adequate budgetary allocation for disaster management and preparedness in the Budget.

Figure 3.1: Mock Exercise (2017) In Mianwali, Narowal, Kasur, Layyah etc.



Mock Exercises 2017 being carried out in Mianwali



Mock Exercises 2017 being carried out in Narowal



Mock Exercises 2017 being carried out in Layyah



Mock Exercises 2017 being carried out in Mandi Bahauddin



Mock Exercises 2017 being carried out in Gujranwala



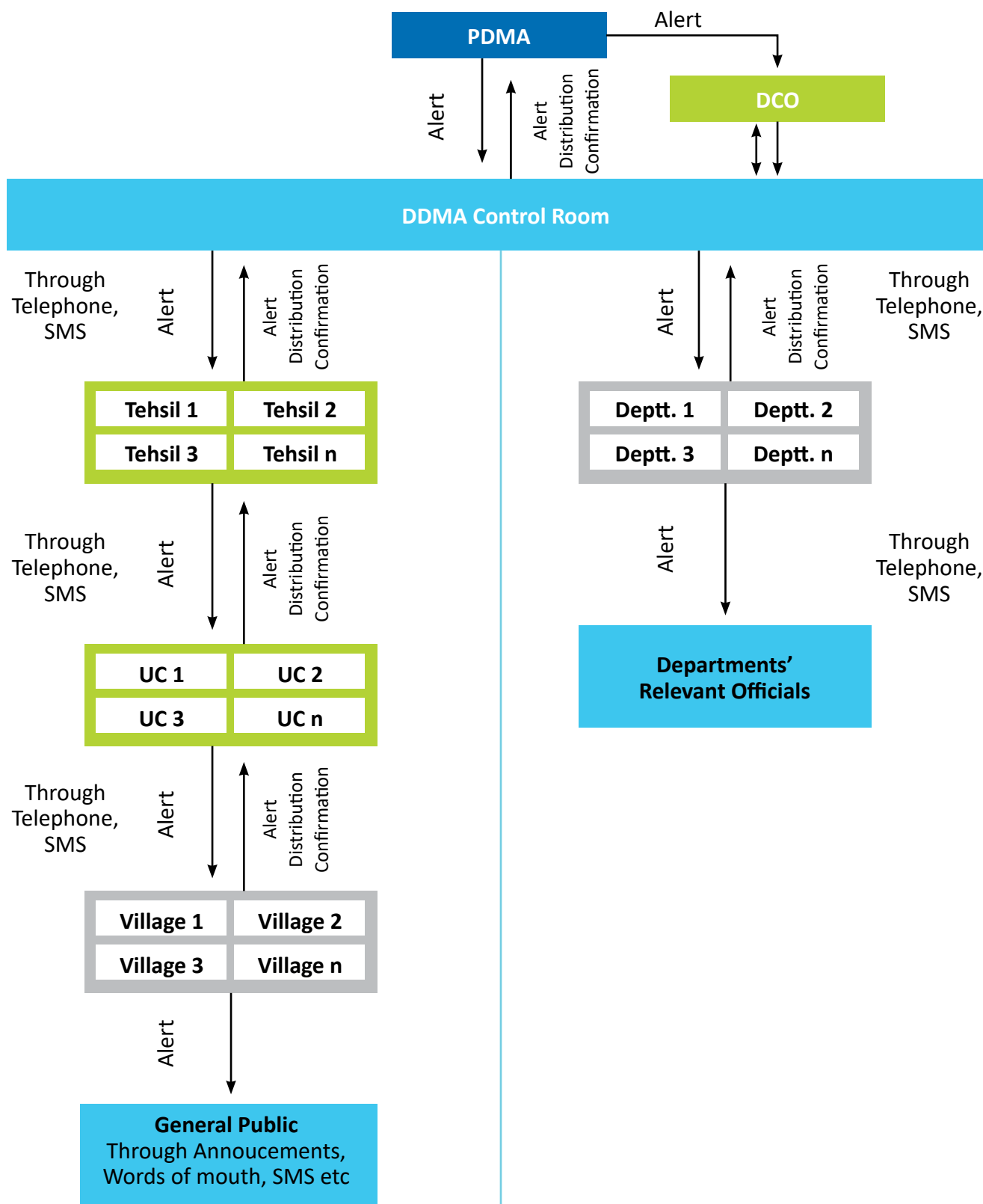
Mock Exercises 2017 being carried out in D G Khan

3.2.8 PDMA CONTROL ROOM

Something good which has been practiced since, is the operationalization of Control Room at 40 Lawrence Road Lahore (Head Office PDMA Punjab) and Flood Warning Center at 46 Jail Road Lahore (MET office Lahore). It starts functioning from June, 15 and remains operational till October, 15. All stakeholders' representative sit together under one roof and closely monitor river discharges and keep an eye on changing weather and issue alert on daily basis in normal conditions and keep stakeholder updated and informed through short messaging service (sms). Frequency increases with any abnormal / unusual development in weather or river gauge / discharge. Representatives of PDMA Punjab, Irrigation department, C&W department, Punjab Police, Rescue 1122, Metrological department, WAPDA, Pakistan Army, Airforce, SUPARCO and etc. remain there round the clock. All sorts of communication facilities are provided there such as wireless, phone, fax, e-mail, internet, television etc. The basic function of PDMA Control Room is to gather information from all concerned departments and pass it on to the concerned districts or regions in an effort to fore-warn them and to reduce loss of life and property. The early warning always helps in planning proper evacuations and rescues. PDMA in participation with PTA and PITB broadcasted SMS to residents of flood prone area in the past, informing them about the intensity of flood with timeframe, requesting them to evacuate within given time. This activity is also planned in 2017. Following officers of PDMA Punjab will be responsible for effective coordination throughout the flood season.



Figure 3.2: Flood Management Mechanism of PDMA Punjab



3.2.9 MEDIA WATCH AND PUBLIC AWARENESS

Disasters destroy communication routine channels and telephone networks, making rescue and relief operation further difficult for disaster management authorities. It becomes quite difficult to reach endangered / stranded people after the collapse of cellular network. In such difficult situations, media becomes much more important. Media can help authorities to convey their life saving instructions and messages to disaster hit people. Keeping importance of media in emergency situations in view, PDMA establishes permanent cell for interaction with Media teams and keep media update. Simultaneously PDMA Punjab uses media to communicate safety instructions, Relief Camp locations to general public and affectees. Information department deploy deputy director level officer to remain in PDMA's Control Room throughout the disaster event. This cell not only issues warnings through both the print and electronic media but also collaborates with all media houses and issues certain guidelines and instructions for victims of disaster sharing information regarding various rescue and relief operations.

Parallel to early warning PDMA is keeping 1129 helpline operative in collaboration with Punjab Information Technology Board (PITB) on 24/7 mode to help people of flood prone areas. This helpline is a source of information for the vulnerable communities regarding flood situations or any other disaster and timely evacuation in worst case scenarios. Apart from early warning and intimation the helpline also receives SOS calls and these SOS calls are diverted to respective districts to respond to requests of the callers on emergency basis. Helpline operators remain in contact with the callers and keep them updated.

PDMA shares all weather updates with the helpline team on daily basis which in turn responds to the questions of the callers. Before the onset of monsoon season PDMA may conduct orientation sessions with the helpline operators if the need arises. PDMA helpline is a good tool to review the performance of field formations, and the efficiency and effectiveness of rescue, relief and rehabilitation program through the public feedback. Any complaint if lodged is also catered for as per set policies and codal formalities.

Figure 3.3: PDMA Helpline 1129



3.2.10 PDMA WAREHOUSES

United Nations World Food Program (WFP) in collaboration with PDMA and the government of Punjab established state of the art warehouses at Muzaffargarh and Lahore. These warehouses are termed as “Humanitarian Response Facility” (HRF) and have a total storage capacity of around 3,000 MT and are established with a cost of 3.0 million dollars. These HRFs have enabled PDMA to store relief items for two different regions of Punjab. These storage facilities effectively have reduced the time lag for supplies to southern Punjab. Apart from the above warehouse WFP also established flosspans (small warehouses) in 11 vulnerable districts of Punjab with the storage capacity of 300-500 MT (each).

Figure 3.5: HRF Jallo, Lahore



3.3 DISASTER RESPONSE FUNCTIONS

3.3.1 RESCUE AND EVACUATION

In case of Disaster, the DRF (PDMA Punjab and Rescue 1122) and District Administration act as First Responders. PDMA and allied stakeholders have changed their approach and shifted from reactive to proactive mode and this approach has proved very useful. Early warning system and evacuation has proved very fruitful, less resources are needed as compared to rescue efforts. PDMA in collaboration with stakeholders have succeeded in gaining trust and confidence of the people of flood affected areas. PDMA relies more on early warning and recommends DDMA to evacuate risk prone area within given timeframe. Sometimes services of police are also required to get area evacuated. However, it has also been observed that few people remain with their livestock at livestock shed which are constructed on elevated plinth and remain safe. Timely evacuation significantly lessens burden of rescue efforts. Nevertheless, rescue operations continue until water recedes and come down its normal level. Once a disaster or calamity strikes any place or region then the three R (Rescue, Relief and Rehabilitation), come into play. The first step or response is that of rescue but if proper information is available and the threatened area is identified then the people at risk can be safely evacuated as

well. Hence for practical purposes the evacuation precedes the rescue as a response to any disaster.

DDMAs normally take services of revenue department to carry out evacuation activities; however, this decision rests with the DDMA to decide which department is to be assigned this duty. It may vary from district to district.

Evacuations would be coordinated and ordered by the Deputy Commissioner considering the on-ground scenario. Forced evacuation can also be ordered by the Deputy Commissioner depending upon the magnitude of the disaster. People may also be warned to evacuate through sirens, drum beatings, radio, cable TV or other local means i.e. Mosque announcement. PDMA is working on an innovative idea of voice messaging to risk prone areas for early warnings and evacuations from the endangered areas.

If the disaster is of exceptionally high level and DDMA feels that it would not be possible to be handled by them with available means they can invite Pakistan Army which acts as Reserve Responders.

3.3.2 RELIEF EFFORTS – CAMP MANAGEMENT SYSTEM

Normally communities living near riverine belts have two houses, one at farm near river and the second in their villages. Magnitude of the disaster determines whether one shelter is hit or both houses get affected. In the earlier scenario they go back to their village. However, if their shelter / houses are inundated then they are displaced and they rely on governments for shelter as well food. PDMA has issued instructions to DDMAs of flood prone districts for identification of suitable sites for camp establishment in case of floods, that should be high raised, elevated and close to affected areas where required facilities either available or easy to arrange, It has also been observed in the last several floods that people of Punjab prefer to stay with their relative instead of staying in camps. In low level flood situation, displaced people are kept in nearby public building i.e. school or hospital etc. And when the number of displaced becomes significant, then a camp village is established. The locations of these relief camps have been duly indicated in the flood contingency plans prepared by the District Administrations and more or less are at the same location as per previous floods. These camp sites would be equipped with proper medical, water and sanitation facilities by the District Administrations. Transport vehicles for the evacuation of

TABLE 3.5: FLOSPANS

S.No.	District
1.	Muzaffargarh
2.	DG Khan
3.	Layyah
4.	Rajanpur
5.	Mianwali
6.	Bhakkar
7.	Gujrat
8.	Sialkot
9.	R Y Khan
10.	Bahawalpur
11.	Rawalpindi

victims would be arranged from government and private sources. Staff of Punjab Emergency Services will carry out timely and effective operations to locate and rescue persons and take them to safe places.

Apart from food shelter and clean drinking water, another important requirement is sanitation. PDMA has issued instructions to all DDMA's to construct separate toilets and bathing facilities for men and women and to meet standards that are followed while setting up washrooms and toilets in emergency situation, as fecal material can easily spread epidemics if not properly disposed of. District Administration and /or WASA authorities should actively be involved in properly cleaning the facility on daily basis. Mosquitoes too are a constant menace in such open environment especially during flood disasters hence regular anti mosquito sprays must be ensured. It must be ensured that all segments of society are properly taken care off during emergency situation and in camps. Special arrangement should be made for highly vulnerable group in camps / temporary shelters. Special care should be given to highly vulnerable groups i.e. elders, children, pregnant women and disabled person. The elderly and disabled must be provided with comfortable and easily accessible areas of the public facilities designated as temporary shelters. The temporary shelters should never be overcrowded as it can create unhygienic conditions. The medical center at these shelters should be stocked with the basic medicine such as anti-rabies, anti-venom, anti-malarial medicine, and other antibiotics etc.

Apart from organized camp sites established by the Government or humanitarian organizations there can also be numerous scattered settlements in the immediate vicinity of affected villages. The scale of these settlements is variable but these people are equally entitled to relief that the Government disburses and they should be catered for. It has been observed during last few disaster relief operations that affectees prefer to stay with their relatives instead of staying in shelter established by DDMA's or any other humanitarian agency. They become burden on the host who are themselves affected to some extent. It is therefore recommended that such affectees may also be considered for ration and other relief goods.

There are various international standards that need to be fulfilled and followed while setting up or establishing shelters. However the reality is that the field conditions are not always conducive and field officers / officials are not always well trained or equipped to meet those standards. So conditions do vary from camp to camp, but generally certain basic minimum standards have to be met at all these shelters. Desired standards are;

1. Camps would be established in areas accessible by metal roads so that it becomes easy for management to prove essential facilities in camp.
2. Basic facilities such as food, clean drinking water, health, hygiene and sanitation would be available at these shelters.
3. Proper registration mechanism should be in place to differentiate between those actually affected and cunning opportunists
4. Proper security system should be in place in coordination with the local police as the presence of police always acts as deterrence for criminals who may be attracted to such places.
5. Emergency medical care should be available as well as a proper firefighting system as fire out breaks are common in such tents.
6. Proper camp management should be announced and notified and there should be a complaint cell as well.
7. A proper distribution mechanism should be in place to ensure that all needy get what they deserve. White collar people feel shy of appearing in public to receive ration or other relief goods hence management should keep an eye on this and should ensure they also get relief good as per their need.
8. Scattered camps need additional resources to manage them separately hence affectees should be convinced to shift to nearby main camp for the ease of management and better look after of displaced people.
9. At times shallow hand pumps are not safe for drinking as underground water gets contaminated, hence supply of clean drinking water should be ensured. Moreover, water purifying pills should be distributed if medicated clean water provision is not being provided.
10. Vector control is an essential part of the camp management and steps should be taken to eradicate rats, snakes and mosquitoes etc.
11. Un-accompanied children should be placed separately with proper care and fulfillment of their physical and psycho-social needs. Missing persons / children should be reported immediately to DPO, DC and PDMA.
12. Needs of women as per local and cultural environment shall be considered for establishing separate relief camps for ladies with provision of proper security, light arrangements. Moreover, their medical needs should also be kept in mind and be arranged with some female member of the Camp Management.

TABLE 3.6: SOPs FOR CAMP MANAGEMENT

Land	3.0-4.5 square meter per person
Shelter	3.5 square meter per person
Water	15-20 liters per person per day
Food	2100kcal per person per day
Toilet	One per family of 6-10 persons
Health Centre	One per 20,000 persons
Child Friendly Spaces	2-4 year olds- 15 children:2 facilitators 5-9 year olds-20 children : 2 facilitators 10-18 year olds- 30 children :2 facilitators
Hospital	One for as many as 200,000 persons

Figure 3.6: Camp Management



3.3.3 PROVISION OF MEDICAL SERVICES

Disasters disturb almost all segments of the society and compel them to dislocate and get together in Camps. Different people of different background with varying immunity levels get together in camps and remain there for unpredicted time. On one hand all displaced people are under stress due to the disaster, above that close interaction and contact with communicable diseases' patients, make highly vulnerable group susceptible to those diseases. Moreover floods, and to some extent other disaster too, provide conducive environment to vector born disaster as water stays in ditched and den after flood water recedes. Hence it become important to offer medical facilities at camp during emergencies and at site after water recedes.

The main purpose of providing health services in disaster situations is to prevent, reduce and to control the spread of infectious and contagious diseases after a disaster. Major diseases that are observed in these circumstances are gastroenteritis, diarrhea, scabies, rash, malaria and snake bites etc. Therefore all relief camps shall have a medical center. Mobile clinics would also be immediately setup in the affected areas. These clinics should be fully equipped to cater for the medical needs of the affected people. The District Health Departments will spearhead the relief effort in coordination with Provincial department and PDMA. The assistance of NGOs and International NGOs may be solicited as per the government policy. Proper maintenance of records of all patients should be ensured to be able to identify any epidemic outbreaks or for any other assessment.

Orphans, destitute women and other vulnerable elements of the affected population are the responsibility of the social welfare department. Their teams should be available in the affected areas registering such persons and shifting them to proper places separately, setting up special camps for them. There would be an ongoing systematic collection, collation, analysis and interpretation of patient data.

A Disease Early Warning System would track the outbreak of diseases such as cholera, typhoid and malaria. The main goal of this system is to minimize the morbidity and mortality by detecting epidemics at the earliest possible stages. The 3C must assess the functional status and capacity of local, public and private health institutions/ organizations in the vicinity of the disaster affected area.

3.3.4 REHABILITATION

Disasters cause manifold damages to the resident of areas which are hit by any disaster, on one hand they destroy their shelters and on the other hand they affect their properties and livelihoods too. In case of floods, crops and livestock which are main sources of their income also get affected. Government of Punjab seems to become permanent partner with disaster affectees, in rehabilitation process by offering financial assistance programs for disaster affected people since 2010. Punjab has faced floods every year since then and Government has launched Emergency Cash Transfer Program every year. Watan Card, Citizens' Damage Compensation Program, Khadim e Ala Relief Card, Khadim e Punjab Imdadi Package are main Emergency Cash Transfer Programs offered launched by Government of Punjab for Flood affected people of 2010, 2012 and 2014 Floods.

Apart from cash, affected persons may also be provided with transport, if they have been relocated away from their villages. Similarly basic amenities that were given to them in the camps such as tents, utensils, beddings clothes, beddings medicine NFIs etc. may be carried by them back to their places. These items specially the tents are very useful for shelter during the rebuilding of houses.

Rehabilitation is largely dependent on the restoration of basic communication networks and infrastructures including roads and bridges. Without the proper access, people are generally reluctant to return to their home places. Also roads and bridges make repatriation easier for stakeholders. Therefore the provincial government through its departments such as Communication & Works and Irrigation should, on top priority, reopen and where needed rebuild the basic road and bridge structures so that the basic communication and road networks become operational. This is absolutely essential for the rehabilitation process.

Similarly other departments have to restore their basic facilities, where buildings have been damaged they should

be repaired and reopened. Schools and hospitals etc. are basic facilities that have to be reopened for the public in order to facilitate rehabilitation and repatriation of the affected population. Electric Power supply is very critical and essential for rehabilitation. WAPDA authorities should, on top priority, restore its connections and supplies in order to facilitate those who are returning to their homes.

Alternatively, safety of affectees would be a part of the security management. Police and other Law enforcing agencies would maintain law and order during and after the emergency, and provide security to the people affected by disaster. Appropriate measures would immediately be taken to prevent the children from child labor or sexual exploitation. The social welfare department and other NGOs which specialize in children related issues are normally assigned these tasks.

3.4 ROLES & RESPONSIBILITIES OF DEPARTMENTS

3.4.1 NATIONAL DISASTER MANAGEMENT AUTHORITY (NDMA)

National Disaster Management Authority oversees the establishment of early warning system and prepares national contingency and post disaster plans.

ROLES AND RESPONSIBILITIES

1. NDMA is the prime national agency for disaster management and provides broad based guidelines and supports (technical & material) in case of 3rd level disaster hits any area.
2. NDMA sets up a National Emergency Operation Centre (NEOC) and maintains a state of readiness with all equipments in working order.
3. NDMA coordinates with Non-governmental, UN organizations, international NGOs and donor partners regarding availability of resources and information sharing.
4. NDMA also ensures the safety and security of members and representatives of the I/NGOs and other UN agencies that are working in the field during any disaster situation.
5. At the onset of a disaster, NDMA activates the National Emergency Operation Centre which organizes initial assessment of disaster and coordinates all concerned departments to respond with the right amount of resources.
6. NDMA also closely monitors the disaster situation and gathers information from all district administrations and provincial PDMA's and governments as per its mandate provided in NDM Act 2010.
7. NDMA also actively involves in the provision of support and relief material to all parts of the country and coordinate with them in disaster situations.
8. NDMA also coordinates with the federal ministries and agencies regarding any disaster.
9. The world has become a global village and in today's community of nations Pakistan also supports other nations which are affected by disasters. NDMA is also responsible for arranging and providing international aid and help.

3.4.2 DISTRICT DISASTER MANAGEMENT AUTHORITIES (DDMAS)

ROLES AND RESPONSIBILITIES

DDMAS are created under Section 18 of the NDM Act 2010 which defines their composition and also outlines their functions, duties and powers.

District Disaster Management Authorities are the first line of defense and the implementing arm of the government policy and plans. Within the district there are three to four key players/departments that have to put up a joint and coordinated effort in order to fight with and handle any disaster under the leadership and coordination of the Deputy Commissioner. The office of the DC fully supported by the DPO and line departments such sets of responsibilities followed by the role of provincial departments (Contact details of Deputy Commissioners and ADCs are attached at Annexure-II and of Rescue 1122 at Annexure-III).

All district administrations had prepared a detailed contingency plan to face any disaster or hazard specially floods which until recently have become an annual affair for some districts.

The district administration will divide the area as per district division with the Assistant Commissioner as in charge of his / her tehsil. All disaster related activities in a said tehsil will be coordinated through the concerned AC and the District Administrations.

On receipt of a flood warning, immediate warning will be conveyed to all the concerned officers. Immediate action will be taken in each sector / sub sector for evacuation of the population from risk prone areas to safer places or to Relief Camps. An Assistant Commissioner will ensure that announcements are made through loudspeakers of the mosques utilizing the services of the Revenue department. Headmasters of the Schools, Imam Masjid and councilors to make announcements etc.

The tactical operations would be headed by the ADC designated by the Deputy Commissioner. The ADC would be responsible for coordinating and supervising the disaster control and relief measures in the district.

District Administration must establish a Disaster / Flood control room at the DC's office, the numbers of which will be circulated to all concerned. The Disaster / Flood Control Room has to maintain updated information regarding the threat of disaster and statistics post disaster. The center will maintain a regular communication with the Flood Forecasting Division or the dam authorities up stream in case of a flood.

The District Administration would immediately mobilize the equipment needed to tackle the challenges created by a disaster. The District Administration will provide a comprehensive list of flood fighting equipment to PDMA as part of their flood contingency plans.

CEO, District Health Authority will ensure the availability of adequate medicines for treatment of common issues, particularly for snake and dog bite cases and general vaccines at each relief camp.

District Regional Transport Authorities (DRTAs) in all 36 districts of Punjab are managed by Secretaries who would coordinate with local transporters to arrange for arranging transport required for evacuation of people from affected areas. In case of shortfall in transport in a particular district, the adjoining district would mobilize the transporters in his district to assist with the evacuation of people.

All districts are required to prepare a District Disaster Management Plan as per a uniform template devised by PDMA Punjab. This DDMP would help all offices and districts to cope with any disaster or emergency. DDMP template is attached at Annexure-I.

PDMA requests all District Administrations to implement the following as a corollary to the Pre-Flood arrangements:-

1. Monthly DDMA Meetings
2. Inspection of flood protection bunds etc. with concerned departments
3. TPV of all flood fighting equipment

4. Rationalized demand of flood fighting equipment (Details of District Stocks are at Annexure-V)
5. Survey and action on dangerous buildings
6. Full dress Mock exercises
7. Removal of encroachments in coordination with Irrigation Department, Home Department and Punjab Police
8. Pre-qualification of vendors for Food items and local transport

3.4.3 IRRIGATION DEPARTMENT

Punjab's Irrigation infrastructure consists of 14 Head works and Barrages that generate 21 different main canals. These canals along with their branches cover almost 4000 miles to deliver water to more than 2000 distributaries and minor canals. This vast network of water channels irrigate 20 million acres of land in the Province. As such the role of the Provincial Irrigation Department (PID) Punjab is critical during floods and the monsoon seasons.

ROLES AND RESPONSIBILITIES

1. Irrigation department should therefore ensure that the following actions are taken well before the onset of the monsoon season.
2. Continuous monitoring of the water levels in the major water channels and dams.
3. In case of rising discharge rates, the Irrigation department issues early warnings to the PDMA and other districts about such discharges. This information is very critical regarding discharges from spill ways of the two major dams.
4. Protection of barrages, settlements, canals, bunds, spurs and communication infrastructure such as railways, highways etc. have to be ensured. Vulnerable embankments have to properly protected and strengthened throughout the Province. The embankments stretch for more than 3,300 kilometers.
5. All the six different zones, headed by a zonal chief should prepare a flood fighting plan and submit it to the Chief Engineer, Drainage and Floods for review. The Chief Engineer should review the zonal plans and prepare a comprehensive contingency plan for the entire department.
6. Chief Engineer (Drainage and Floods) through the Executive Engineers (XENs) should ensure inspection of flood works to identify damages to embankments or the encroachments blocking passage of water in various channels.
7. Irrigation department has to work in coordination with other civil authorities to take care of the encroachments on embankments and spurs.
8. The department must also maintain a state of readiness and ensure the availability of stones and other flood fighting materials in proper stocks prior to the monsoon season.
9. The flood warning and control room should be established in coordination with the allied departments.
10. Preparation to reinforce or breach a section in case of any emergency should be in place.
11. The Irrigation personnel are deputed at head works and vulnerable points for timely warning equipped with wireless sets (base & mobile) to communicate the discharge rates.
12. Irrigation department maintains 19 breaching sections throughout the Province. These breaching sections are vast land areas. A threatening increase in water levels can be managed by diverting excess water into the breaching sections.

TABLE 3.7: LENGTH OF VARIOUS RIVERS OF PUNJAB

RIVER	LENGTH OF RIVER (K.M.)	LENGTH OF BUNDS	SPURS / STUDS
INDUS	547	811	131
JHELUM	363	155	43
CHENAB	731	1330	309
RAVI	694	630	127
SUTLEJ	515	406	30
TOTAL	2850	3332	640

TABLE 3.8: FLOOD BUND CATEGORIES

INFORMATION REGARDING FLOOD BUND CATEGORY A			
SR.NO	NAME OF DIVISION	NAME OF EMBANKMENT / BUND	LENGTH (ft.)
SARGODHA ZONE			
1	Rasul Head works Division	Right Guide Bund	2,121
2	-do-	Left Guide Bund	3,360
3	-do-	Right Guide Spur	2,762
4	-do-	Left Marginal Bund	17,170
	Total in Feet.		25,413
	Total in Miles.		4.81
PMO BARRAGES			
1	Kalabagh H/Works Division	Jinnah Barrage	25,080
	Total in Feet.		25,080
	Total in Miles.		4.75
FAISALABAD DIVISION			
1	Khanki Division	Left Marginal Bund	21,000
2	-do-	Right Marginal Bund	29,000
3	Jhang Division	Jhang Flood Protection Bund	43,875
4	Qadirabad Barrage Division	Left Marginal Bund	20,000
5	-do-	Right Marginal Bund	20,000
	Total in Feet.		133,875
	Total in Miles.		25.36
BAHAWALPUR ZONE			
1	Punjad Head works Division	Right Marginal Bund	15,000
2	-do-	Left Marginal Bund	15,000
3	-do-	Colony Protection Bund	15,000
4	Khanpur Canal Division	Minchin Flood Bund	10,000
	Total in Feet.		55,000

	Total in Miles.		10.42
MULTAN ZONE			
1	Trimmu Division	Right Marginal Bund	20,000
2	-do-	Left Marginal Bund	20,000
3	Sulemanki Division	Left Marginal Bund	10,000
4	-do-	Right Marginal Bund	10,000
5	Shuja Canal Division	Right Bank of Shujabad Branch	10,000
6	-do-	Akbar Flood Bund	10,000
	Total in Feet.		80,000
	Total in Miles.		15.15
D.G.KHAN ZONE			
1	Taunsa Barrage	Right Guide Bund Upstream	15,000
2	-do-	Left Guide Bund	20,000
3	-do-	Shahwala Groyne	10,000
4	Muzaffargarh Canal Division	Muzaffargarh Flood Bund	50,000
5	-do-	Doaba Flood Bund.	5,000
6	-do-	Khangarh Flood Bund	5,000
7	-do-	Khanwah Flood Bund	5,000
8	Jampur Construction Division	Jampur Flood Bund	5,000
9	-do-	Rojhan Flood Bund	20,000
	Total in Feet.		1,35,000
	Total in Miles		25.57
LBDC(IP)			
1	Balloki Head works Division	Left Marginal Bund	15,000
2	Do	Right Marginal Bund	15,000
	Total in Feet		30,000
	Total in Miles		6
LAHORE ZONE			
1	FLOOD Bund Division Narowal	Jassar Highway Bund	10,000
2	Do	Rayya flood Bund	5,000
3	Pasrur Link Division Sialkot	City Flood Protection Bund along AikNullah	7,340
4	Do	Hajoipur Flood Protection Bund along AikNullah	86,00
5	Do	Left Flood Protection Bund over DegNullah from defence embankment to ZafarwalaKingra road	10,000
6	Marala Division UCC	Left Marginal Bund	50,000
7	Do	Right Marginal Bund	10,000
8	Lahore Drainage Div.	Shahdara Flood Protection Bund	15,000
	Total in Feet		115,940
	Total in Miles		22
	Grand Total in Miles		114

INFORMATION REGARDING FLOOD BUND CATEGORY – B			
Sr.No.	Name of Division	Name of Embankment / Bund	Length (ft.)
SARGODHA ZONE			
1	RasulHeadworks Division	Important / Vulnerable Reaches	10,000
2	Bhakkar Division	-do-	10,000
3	Layyah Division	-do-	10,000
4	Jhelum Division	-do-	5,000
	Total in Feet.		35,000
	Total in Miles		6.63
FAISALABAD ZONE			
1	Khani Division	-do-	20,000
2	Jhang Division	-do-	50,000
3	Qadirabad Barrage Division	-do-	60,000
4	Burala Division	-do-	35,000
	Total in Feet.		165,000
	Total in Miles		31.25
BAHAWALPUR ZONE			
1	Punjnad Headworks Division	-do-	90,000
2	Khanpur Canal Division	-do-	100,000
3	Bahawalpur Canal Division	-do-	50,000
4	Rahimyar Canal Division	-do-	50,000
	Total in Feet.		290,000
	Total in Miles		54.92
MULTAN ZONE			
1	Trimmu Division	-do-	80,000
2	Suleimanki Division	-do-	50,000
3	Shujabad Canal Division	-do-	60,000
	Total in Feet.		190,000
	Total in Miles		35.98
D.G.KHAN ZONE			
1	Taunsa Barrage	-do-	80,000
2	KotAdu Canal Division	-do-	90,000
3	Muzaffargarh Canal Division	-do-	180,000
4	River Diversion Division	-do-	80,000
5	Jampur Construction Division	-do-	140,000
6	D.G.Khan Construction Division	-do-	60,000
	Total in Feet.		630,000
	Total in Miles		119.32
LBDC (IP)			
1	Balloki Headworks Division	-do-	40,000
2	Okara Division	-do-	40,000

3	Sahiwal Division	-do-	20,000
	Total in Feet.		100,000
	Total in Miles		18.94
LAHORE ZONE			
1	Flood Bund Division Narowal	-do-	40,000
2	Pasrur Link Division Sialkot	-do-	10,000
3	Chakbandi Division	-do-	20,000
4	Marala Division UCC	-do-	50,000
5	Lahore Drainage Division	-do-	80,000
6	Kasur Division	-do-	80,000
7	Gujranwala UCC	-do-	100,000
8	Rachna Drainage	-do-	42,000
	Total in Feet.		422,000
	Total in Miles		79.92
PMO BARRAGES			
1	Jinnah Barrage	-do-	20,000
	Total in Feet.		20,000
	Total in Miles		3.79

Grand Total (in Miles)

350.76

TABLE 3.9: STONE PROCUREMENT IN 2017

Irrigation Zone	Available (lac cft)	Funds Released (Rs. m)	Remarks
DG Khan	50%	45.550	Procurement underway
Multan	88%	-	
Faisalabad	70%	-	
Bahawalpur	71%	-	
Lahore	34%	8.038	Tenders to be opened on 10/11.5.18
Sargodha	39%	49.320	Tendering completed, work yet to be awarded
PMO Barrages	70%	-	
LDCIP	60%	14.587	Procurement underway

TABLE 3.10: DESIGNED CAPACITIES OF RIVERS AND DISCHARGE RATES

River	Gauge Site	Designed Capacity (lac Cs)	Flood Limits in Lac Cs.				
			Low	Med:	High	Very High	Exp. High
INDUS	Kalabagh	9.5	2.5	3.75	5	6.5	8
	Chashma	10	2.5	3.75	5	6.5	8
	Taunsa	10	2.5	3.75	5	6.5	8
JHELUM	Kohala	12	1	1.5	2	3	4
	Mangla	10.6	0.75	1.1	1.5	2.25	3
	Rasul	8.5	0.75	1.1	1.5	2.25	3
CHENAB	Marala	11	1	1.5	2	4	6
	Khanki	8	1	1.5	2	4	6
	Qadirabad	9	1	1.5	2	4	6
	Trimmu	6.45	1.5	2	3	4.5	6
	Punjnad	7	1.5	2	3	4.5	6
RAVI	Jassar	2.75	0.5	0.75	1	1.5	2
	Ravi Syphon	4	0.4	0.65	0.9	1.35	1.8
	Shahdara	2.5	0.4	0.65	0.9	1.35	1.8
	Balloki	2.25	0.4	0.65	0.9	1.35	1.8
	Sidhnai	1.5	0.3	0.45	0.6	0.9	1.3
SUTLEJ	G.S.Wala	10 ft.	19.5	21.5	23.3	25.3	
	Suleimanki	3.25	0.5	0.8	1.2	1.75	2.25
	Islam	3	0.5	0.8	1.2	1.75	2.25
	Mailsi Syphon	4	0.75	1.1	1.5	2.25	3

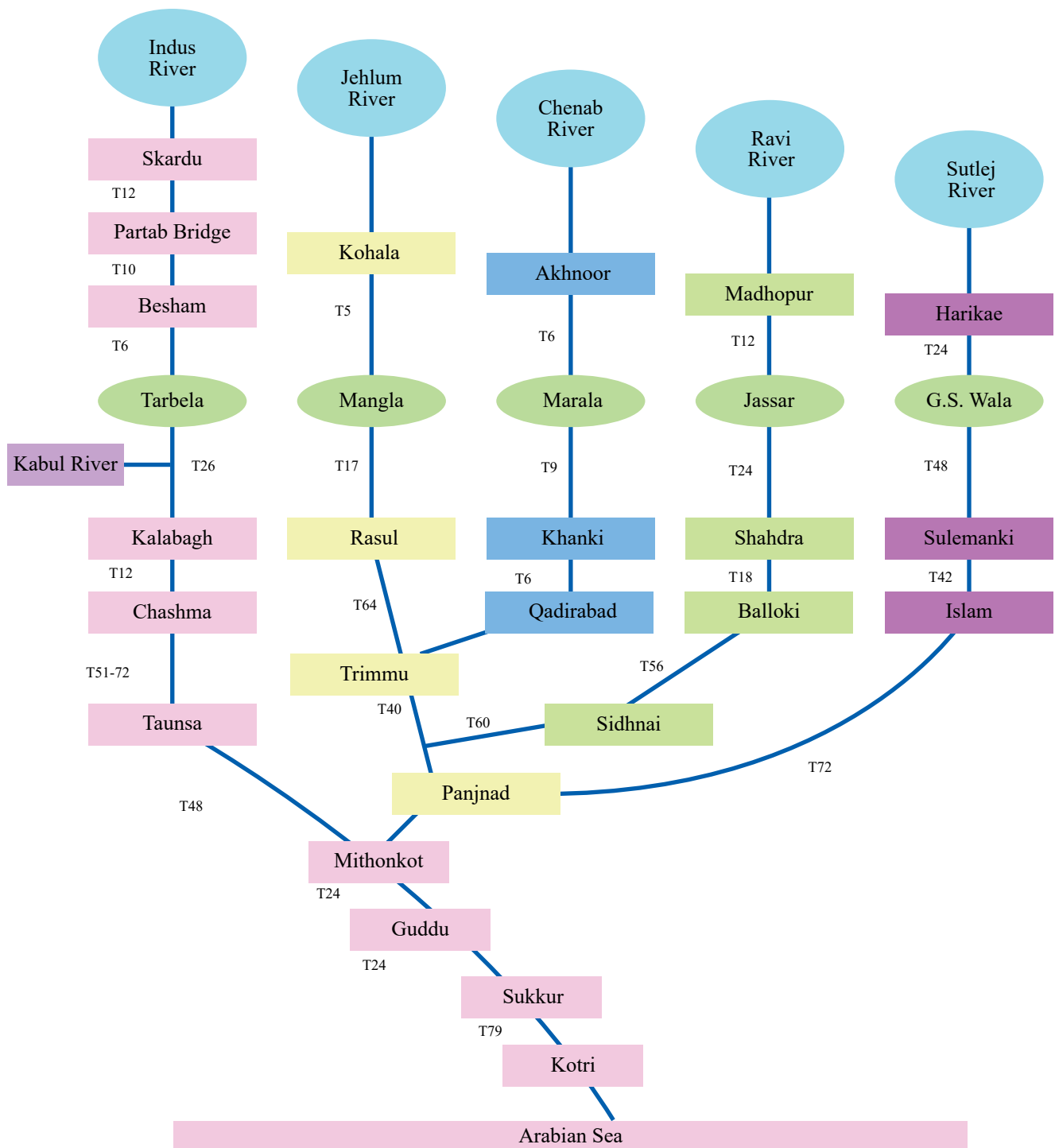
TABLE 3.11: NUMBER OF BREACHING SECTIONS IN PUNJAB

Department	Number of Breaching Sections
PID Punjab	13
Pakistan Railways	04
NHA / Provincial Highways Department	02
Total	19

Figure 3.7: Irrigation Zones in Punjab



Figure 3.8: River System and Flood Routing Model in Punjab



Note: T = Average travel time in hours

Source: Flood Forecasting Division, Pakistan Meterological Department

3.4.4 PUNJAB EMERGENCY SERVICE (RESCUE 1122)

3.4.4.1 THE DISASTER RESPONSE FORCE (DRF)

Government of the Punjab has notified a Disaster Response Force (DRF) under the PDMA comprising Rescue 1122, Civil Defence, and the District Disaster Coordinators. 1122 and the Civil Defence form the working and implementing arm of the DRF. It would comprise of 7,500 personnel of Rescue 1122, trained in water rescue and generally any form of disaster. The DRF would be under the operational command of Rescue 1122. PDMA has already provided 210 boats to Rescue 1122 for rescue and evacuation efforts. The Disaster Response Force would carry out sophisticated search and rescue and evacuate affected and vulnerable people. To manage the high number of operations during a disaster, Rescue 1122 would establish a Provincial Monitoring Cell at its headquarters in Lahore. This monitoring cell along with Rescue 1122's command and control room would be operational around the clock and would also be linked with the 4C at PDMA through video conferencing and radio link.

Rescue 1122 organization has been established for immediate response to emergencies and disasters. 1122 specializes in the provision of emergency medical treatment to persons affected by emergencies. PES evacuated about thousands of victims from the flood hit districts of the province specially Jhang, Muzaffargarh, and Multan during the recent floods of 2014 in the river Chenab. They are trained in sophisticated search and rescue techniques and 1122 is Punjab's foremost rescue agency. The agency possesses multipurpose rescue vehicles that contain essential rescue equipment such as heavy duty hydraulic cutters, spreaders, and electronic search and rescue devices. Apart from the Rescue vehicles the agency also possesses Ambulances, Fire fighting vehicles, Water Bowsers, Water Rescue vans, Recovery vehicles, Boats, OBM Engines, Life Jackets, Rings and Buoys etc.

ROLES AND RESPONSIBILITIES

1122 assists the district administration in:-

1. The immediate evacuation of people from the disaster prone and vulnerable areas.
2. Provision of immediate medical aid during any emergency and at the same time transporting the injured or sick to the nearby hospital through their team of ambulances.
3. In flood situations rescuing people from drowning in the strong currents is a specialty of 1122 as it has its own set of divers and boats. Similarly in case of collapsed buildings or structures the equipped with heavy machinery to cut through heavy debris.
4. Apart from that responsible deployment of fire fighters, cordoning of hazardous areas, provision of first aid and medical treatment, immediate search and rescue of victims and management of the pre-hospital emergency system.
5. Rescue 1122 is well trained in setting up medical camps for provision of emergency medical treatment. These camps are setup by Rescue 1122's doctors and paramedic staff.

3.4.5 HOME DEPARTMENT

Home Department has six major implementation arms for disaster management activities: Police Telecommunication Department, Police Operations Department, Civil Defense, Special Branch, Traffic Police and Rescue 1122. The Police Department is generally responsible for law and order situation but in case of disaster the department will follow the Standard Operating Procedures (SOPs) issued for a disaster situation by the home department. The primary objective of the Police is to save human lives, and to protect

vital infrastructure, installations, machinery, equipment, stock of resources and to maintain law and order during emergencies/disasters. The department has to make arrangements for traffic control, and planning alternative routes during evacuation and maintaining law and order at the time of evacuation and in relief camps. Roles and responsibilities are as under:-

1. The wireless system and control rooms already established by the PDMA and Irrigation department would be networked with the Police control. Most of the police staff active in the field would be equipped with mobile wireless sets. DSP/Tele (TP) and Inspector Workshop will be responsible for the supply of these wireless sets to different areas and these officials would also work for prompt repair of all nonfunctional equipment.
2. Police should lay special emphasis on ensuring the security of the personnel of the international humanitarian organizations, donors, and embassies, visiting the affected areas.
3. Police should ideally also be trained in search and rescue, evacuation, first aid and emergency response in collaboration with Civil Defence and Rescue 1122.
4. Police would support district administration in evacuation of affected people and transport to camp sites. The police personnel must maintain law and order situation at the camp sites, relief centers, distribution points and shelter sites.
5. The department has to keep close watch for any criminal and anti-state activity in the area activities.
6. Police would draw up security plan for evacuation routes, warehouses, relief camps, relief centers, distribution points and public/private property for any potential disaster in the district and share it with DDMA.
7. Police has to ensure the security of all key points such as siphons, bridges, link drains etc. All police mobiles would be equipped with extra torches, rubber tubes, shovels, snake bite kits, and life buoys etc.
8. Police would plan an active role in the relief disbursement by assisting in the supply and distribution of food and other relief items
9. SP (Operations) will spear head the patrolling of affected areas and evacuation routes. He would plan a shift wise system of patrolling duties to maintain law and order around the clock. Patrolling must be provided on the designated routes of relief supply. The Police would assist the district administration and Rescue 1122 in the evacuation of people at risk.
10. Police manages traffic during a disaster situation and develop alternative traffic management plan to avoid inconvenience. The Police have to coordinate with the C&W or Highways Departments to direct traffic towards alternative routes.
11. Police will also be engaged in forced evacuations in case a disaster becomes imminent and local communities continue to underestimate the destruction that a disaster might cause. In case heavy duty electric lines get ruptured and fall down, the Police would cordon the area before informing WAPDA to take care of the issue.
12. Police Telecommunications branch will provide the communication support to PDMA, Irrigation department or other departmental personnel responsible for patrolling the vulnerable areas. The Police Telecommunication department would deploy its personnel to the affected areas. These teams would be equipped with high frequency sets, ultra-high or very high frequency base sets, battery chargers etc

3.4.6 CIVIL DEFENCE

Civil Defence force assists the district administration in the evacuation of people and their properties from the disaster affected areas.

1. The Directorate engages a large number of volunteers for search, rescue, evacuation and disbursement of relief goods. These volunteers generally known as “Razakars” are usually trained in swimming, rowing, handling of OBM, basic rescue techniques, first aid etc.

2. Civil Defence Razakars basically help local administration / police and Pakistan Army, Rescue 1122 in evacuation and other disaster response activities.
3. Razakars manage and utilize all boats, oars, out board engines, generators, search lights, and other lifesaving equipment. Razakars that know how to swim and dive are utilized for specialized water rescue.
4. These volunteers also assist the fire brigade in rescue, and Health department's representatives in the treatment of injured victims.
5. Civil Defence also assists the District Administration and Police in setting up information desks for general public in emergencies.
6. The Civil Defence Razakars are very helpful in management of relief camps setup by the district administration in disaster situations, performing watch and ward duties as well managing distribution points.

3.4.7 HEALTH DEPARTMENT (PRIMARY & SECONDARY HEALTHCARE DEPARTMENT AND SPECIALIZED HEALTHCARE AND MEDICAL EDUCATION DEPARTMENT)

Government of Punjab is providing primary, secondary as well as tertiary health care services throughout the province with an infrastructure of 2,456 Basic Health Units (BHUs), 290 Rural Health Centers (RHCs), 81 Tehsil Head Quarter (THQ) Hospitals, 36 District Head Quarter (DHQ) Hospitals and 19 Teaching Hospitals. The public sector health delivery system comprises of four tiers and as such will continue to provide services at these four tiers during and after any disaster

Outreach and Community Based Activities, which focus on immunization, sanitation, malaria control, maternal and child health, and family planning. Primary care facilities include BHUs, RHCs, THQs and DHQs provide inpatient and outpatient care. Tertiary care hospitals located in the major cities for more specialized healthcare.

In case of any disaster or calamity the health department will ensure that the following measures are in place:-

1. To provide first aid to the injured people and arrange evacuation of patients for further assistance.
2. Medical camps and mobile health teams should be arranged for prevention and control of communicable diseases, immunization and provision of essential drugs.
3. Health department would make a roster of all medical officers and paramedics that would be deployed to these camps and teams.
4. Drugs and other medical equipment should be available at all these camps and with mobile teams. The medicine should be for relevant flood related issues.
5. The shelters or relief camps established by the district administration should have medical centers with ambulances and special facilities for women and children.
6. An emergency control room will be established in the office of Directorate General Health Services and a representative of this emergency control room would be designated to PDMA's control room.
7. A list of essential medicines would be prepared by the Health department and it would ensure that medicines and other resources are present in sufficient stocks in hospitals in disaster hit areas.
8. Medical colleges may be involved to create Emergency Response teams
9. Health department would also coordinate with international organizations such as WHO and UNICEF.
10. Extensive disease surveillances in the disaster hit areas should be carried out warnings if needed be issued through the Disease Early Warning System.
11. Medical teams and paramedic staff should be mobilized and deployed for rapid assessment and quick response

in the affected areas.

12. A contingency plan will be prepared and submitted regarding preparedness for any disaster or calamity.
13. The National Disaster Management Authority has designated WHO as the key organization that will fill the gaps in the supply of medicines, rapid diagnostic kits, and vaccinations etc.
14. CEO District Health Authority would oversee all activities related to health in the district and employ female health workers in emergency areas specially, for spreading awareness regarding health risks in a disaster and for any vaccination or immunization programme that may be needed during any emergency.
15. A Health and Nutrition Cluster for overall management and oversight of Health department's disaster response would be formed at the Directorate General Health office.
16. In case the medicine stocks or even the infrastructure is damaged due to floods, the department would draw up a plan for early recovery of health infrastructure and service delivery.

3.4.8 EDUCATION DEPARTMENT

Education Department is the largest department in terms of manpower and infrastructure. During any emergency their manpower comes in very handy as they are well educated and are technology savvy.

1. The school buildings would be used to establish relief camps and distribution points. These school buildings are normally the first choice for setting up relief camp as they provide safe shelter with basic utilities.
2. The schools are also used to accommodate armed forces that are available to help the district during any disaster. Government Schools provide large open places as well which suits the forces.
3. The CEO District Education Authority would mobilize teachers and staff members to help the affected district administration in the conducting of various surveys and assessments during and after the disaster or floods.
4. The staff and teachers of the department are also very useful in relief camp management and the CEO District Education Authority should issue duty rosters in coordination with the district focal person.
5. A large part of the displaced persons comprises of women. The female staff and teachers of the department should be employed to handle the females during camp establishments, registrations, distributions etc.
6. CEO District Education Authority would ensure that proper surveys of damages to school buildings are conducted and details conveyed to the provincial government and PDMA.
7. Extended stay at relief camps for longer durations can create educational shortcomings. Therefore the Education department would also consider the setting up of emergency mobile schools and provision of teaching material to continue education during the emergency.
8. The department would compile a roster of the volunteer teachers and students who can be deployed as workforce in emergency response. Teachers and students would also provide voluntary assistance in disaster assessment and distribution of relief goods in the affected areas.
9. Education department would also prepare a list of Government schools and colleges that may be used for relief camps

3.4.9 COMMUNICATION AND WORKS DEPARTMENT

C&W Department is responsible for planning, execution, development and maintenance of all Provincial Roads and Bridges for maintenance of the communication infrastructure. The department takes steps to ensure speedy repair and restoration of transport and communication links. During any disaster such as floods, earthquakes etc. the communication infrastructures such as bridges are damaged, the C&W department restores and repairs the infrastructure to restore communication. The C&W department has divided its geographic jurisdiction in

Provincial Highway Circles, headed by a Superintending Engineer who is responsible for disaster response in his particular circle. In case of any disaster or calamity the C&W Department will ensure that the following measures are in place:-

1. Executive Engineers supervise the local emergency response and ensure provision of equipment such as heavy machinery, torches, lamps, red lights and even the steel floating and bailey bridges to the district administration when needed. The C&W department possesses five bailey bridges and six floating or boat bridges.
2. C&W department will conduct an immediate survey of the calamity hit area in order to assess damage to local roads bridges and allied infrastructure. Repair work is based on this early survey and analysis. The department also prepares alternative route plans to guide commuters to roads that are still open and safe for thoroughfare.
3. Bridges are important links in any road network and their repair and restoration is critical for rehabilitation. The help of the Pakistan Army's similar resources may be called in if needed.
4. In case a particular road or bridge is damaged by the disaster, the Sub Divisional Officer along with Executive Engineer In-charge would visit the affected site and report the extent of the damage and possible remedial measures to the Superintending Engineer and Chief Engineer.
5. Executive Engineer would then inspect the possibility of diverting traffic on other roads and would impose speed and load restrictions on roads that are susceptible to any damage. In case the road is blocked by a landslide or falling debris is threatening ongoing traffic, the Sub Engineer and Road Inspector will blast the land mass with explosives and clear the rest of the debris with heavy machinery or manual labor
6. C&W department also assists the Irrigation Department and Army with the opening of breaching sections or as was seen in the recent floods in breaching bunds and other structures.

3.4.10 AGRICULTURE DEPARTMENT

Agriculture is mainstay of Pakistan's economy. It accounts for 21% of the GDP and together with agro-based products fetches 80% of the country's total export earnings. More than 48% of the labor force is engaged in this sector. The role of the agriculture department is therefore of vital importance. The basic aim and purpose of this department is to sustain food security and support the national economy, making agriculture cost effective and knowledge based, with emphasis on farmer's welfare and increased yield potentials with Improvement of agricultural and water management methods. The agriculture department is actively involved in providing protection against insects, pests, augmenting prevention of plants diseases through quality control of pesticides. The department is directly involved in enhancing soil fertility and strives for soil conservation Mechanization, reclamation of land, use of agriculture machinery ploughing, tube-wells and installation and research Agricultural Engineering (Agricultural Machinery and Implements) are some of the important functions of the department.

In case of any disaster or calamity, Agriculture department will ensure that the following measures are in place

1. Agriculture Department is responsible for the assessment of standing crop losses. This exercise can be conducted in coordination with the revenue department as their record is useful in crop assessment. The field assistants have been provided with electronic tablet devices and these can be used affectively for conducting of field surveys.
2. Agriculture department has to immediately report on the standing crop losses and this initial survey helps formulate any compensation policy.
3. Agriculture department also has heavy farm machinery which can be used to help build protection bunds or other structures. Similarly heavy machinery could be used by other departments such as Irrigation or C&W.
4. The entomologists of Agriculture department would also exercise vigilance about pest attack on the crop and take effective measures against it.
5. Provision of fodder for Livestock is very important for during disasters as there is acute shortage of fodder. The department is therefore actively involved in the management of fodder in collaboration with Livestock &

Dairy Development Department and ensures that the fodder is available along with feed supplements such as Wanda etc.

6. In order to ensure that there is no shortage of any vegetable for human consumption the department should be actively involved in monitoring of markets and mandi etc.
7. Agriculture department has many off road vehicles which can also be employed to visit areas that are normally off road and not easily accessible.

3.4.11 LIVESTOCK & DAIRY DEVELOPMENT DEPARTMENT

The Livestock sector plays an important role in the rural economy of Pakistan. Its role is very critical as 30-35 million of the rural population is engaged in livestock raising. The average household holdings are 2-3 cattle/buffalo, 3-4 sheep/goats and 10-12 poultry per family which contributes 35-40 percent of their income from livestock. The role of this sector is very important and it is a major contributor to the agriculture sector of our economy. In case of any disaster or calamity the department will ensure that the following measures are in place:-

1. The primary responsibility of the department is to save animal and poultry population from any direct injuries or fatalities and infectious diseases during and after the disaster.
2. In case of mass evacuation of population and their livestock the livestock department in coordination with the district administration should identify suitable and safe where these animals can be kept.
3. The department will setup mobile veterinary camps in and around the disaster affected areas. These camps will contain all the medicine for controlling water borne diseases and epidemics. The department will exercise extreme vigilance about disease outbreaks in the disaster area.
4. The department would coordinate with Transport department and district administration for rescue operations particularly involving large animals such as cattle and buffaloes.
5. District Livestock Officers would arrange for large scale vaccination specially for diseases such as hemorrhagic septicemia and foot and mouth disease. This is supported by deworming of the animals.
6. The department would also arrange for fodder for the animals. In disaster situations there is an acute shortage of fodder and the livestock department should arrange fodder from outside the district. Furthermore wheat straw or hay stacks and bundles should be arranged and made available for animals. Similarly feed supplement by the four Government owned feed mills at Bohadar-Nagar, Bhuneikay, Rakh Dera Chahl and Kharimourat.
7. The department would conduct a rapid assessment of damages to livestock and provide
8. Financial and technical resources to the district livestock departments for immediate provision of medical and material relief
9. The department would also oversee procurement and replenishment of reserve stock of medicines, vaccines and flood fighting mission.

TABLE 3.12: LIVESTOCK FIELD FORCE 2018

Livestock Field Force	Number
Flood Sectors / Centers	435
Flood Sub-sectors	289
Veterinary Officers	461/500
Veterinary Assistants	1325/1577
Mobile Veterinary Dispensaries	88/211
Mobile Veterinary Diagnostics Laboratory	42

3.4.12 SOCIAL WELFARE DEPARTMENT

The Social Welfare department has to coordinate with all CBOs/NGOs, INGOs, UN organizations, and Rural Support Networks to provide relief to the victims of a disaster and rehabilitate them. During any emergency or disaster the social welfare department represented by the Directors and Deputy Directors Social Welfare in the districts will ensure the following measure and steps.

1. This department must maintain a list of all NGOs and donors articulating their key operations and ensuring that the NGOs are working in line with the government policies.
2. The Social Welfare department would monitor social protection issues in IDP Camps with a particular focus on the status of women and children.
3. The department would coordinate with the DDMA's to ensure that needs of most vulnerable groups such as minorities, disabled, elderly, and widows are addressed in all possible ways.
4. The department would assist the DDMA's in the management of relief camps, distribution of relief goods and the assessment of damages.
5. The department will also play a major role in child protection by opening Child Welfare Units in the disaster affected areas catering to child victims of gender based violence, psychological trauma and physical harm.

3.4.13 INFORMATION DEPARTMENT

Information department reports on the extent of disaster and highlights the measures that the Government of Punjab would be undertaking for rescue and relief operations. All the relevant information on the disaster and the provincial government's response would be communicated to all the media channels. The department has a district information officer in each district who is in close liaison with the district administrations and continuously reports on the measures and steps undertaken by the district. Information department coordinates with all the media channels and networks and ensures that fact and figures are properly reported and projected for the general public.

1. Dedicated team to be appointed by DGPR for performing duties and conducting media campaigns during flood season from 15th June to 15th October in PDMA Control Room.
2. Information department would try to minimize sensationalism specially in the portrayal of disaster management and facts. All efforts would be made to check and limit any propaganda or news that in effect defames, ridicules or undermines the Governmental response. Proper facts and figures will be regularly conveyed to all media houses through regular media releases.
3. Constructive criticism of media is immensely important to reorient the Governmental response; hence, the Information department is responsible for differentiating between rightful criticism and baseless negative propaganda that can spread hopelessness at the time of a disaster.
4. PDMA Punjab would seek media's cooperation in delivering early warnings and information on evacuation routes etc. In case of epidemic disasters, the media can be engaged to relay messages about preventing communicable diseases.
5. It also provides information on the relief and recovery efforts of the Government and other humanitarian organizations. The media highlights the gaps in relief and rehabilitation allowing the Government to prioritize its provision of relief services. The Information department would ensure that the news-items relating to a disaster present an accurate picture of the actual position and do not create undue panic.
6. The department would make sure that media is giving due air time and attention to the Government of Punjab's remedial measures and response efforts. The Information department would continuously communicate

the information about the short and long term measures undertaken by different departments for relief and rehabilitation of affected people

3.4.14 LOCAL GOVERNMENT & COMMUNITY DEVELOPMENT DEPARTMENT

LG & CD department basically is the parent department of all Municipal Corporations / Committees. It would therefore issue suitable instructions to all Municipal Corporations / Committees to ensure the availability of proper equipment and human resources that are required to dispose waste, and deliver clean drinking water in the disaster affected areas. Although the Municipal Corporations / Committees are working under the district administration but from time to time suitable instructions are issued from the department as well regarding provision of clean drinking water, maintenance of proper sanitation and general assistance of the district administration.

1. The department would also have to coordinate with International and National non-Government agencies working on water/sanitation activities. The Local Government has to reduce the chances of such medical emergencies by keeping a close watch on the sanitary conditions of the disaster affected area.
2. The primary objective is to ensure that the disposal stations and main drains are open and functional. All machinery available with the Municipal Corporations / Committees should be functional and working. This department would maintain a close coordination with both Water and Sanitation Authority and Solid Waste Management. The Local Government department has the ability to mobilize heavy duty machinery such as tractors, front end loaders, sewer sucker, jetting machines, water bowsers, dewatering sets and generators etc.
3. The department should ensure that all De-Watering sets, Generators and other machinery are in functional condition before the onset of Monsoon season and that skilled manpower is present to operate the machinery etc.

3.4.15 INDUSTRIES DEPARTMENT

The department is entrusted with the task of ensuring a regular supply of Petroleum, Oil and Lubricants (POL) and essential edible commodities throughout the disaster response. Any shortage in POL would jeopardize all response efforts, including rescue, evacuation or relief provision.

1. Industry department coordinates with the leading Oil Marketing Companies (OMC) to maintain a reserve stock of POL. This department works with Total PARCO, Chevron Pakistan, Pakistan State Oil, and Shell Pakistan to encourage them to store reserve stocks in various geographical regions of the province.
2. The Department will provide PDMA a list of depots where the reserve POL has been stocked.
3. All OMCs take necessary measures in time to maintain reasonable stocks or reserve quantities of fuel and lubricants for a period of one month.
4. The officials of industries department visit the depots where reserve stocks are maintained to ensure uninterrupted supply of fuel to consumers during flood season.

3.4.16 FOOD DEPARTMENT

Food Department would ensure the protection of Wheat stocks against all sorts of disasters. The stocks piled in flood prone areas would be protected by the construction of embankments or the deposition of sand/soil bags around the stock.

1. In case heavy flooding is expected the wheat stock should be removed to safer locations before the onset of the disaster. In case the storage area is waterlogged then, the department would make arrangements to drain out the water.
2. The department would coordinate with the operational flour mills in the disaster affected areas to arrange a supply of flour that would then be distributed in flood affected areas and relief camps.
3. The food department would keep a watch on the market prices of the wheat and should take all possible steps to prevent an exceptional rise in the prices that could result due to the shortage of food after the disaster.

3.4.17 PAKISTAN ARMY

Pakistan Army's resources are employed for immediate search, rescue and evacuation. Pakistan Army is called in the 'Aid of Civil Power' only when a disaster overwhelms the resources at the disposal of the Government of Punjab. The Army's setup in Punjab is administratively divided into six Corps with a Corps Commander leading each Corps. Roles and responsibilities are as under:-

1. The Deputy Commissioner of the affected district would request the relevant Army Authorities for aid of Army upon the approval of the Home Department.
2. PDMA has provided the Army with 850 boats and OBMs for rescue and evacuation purposes. PDMA annually pays for the repair and maintenance expenditures of these 850 boats. During rescue operations at times the use of boats is not possible or feasible. In such circumstances helicopters are used from the army aviation authorities.
3. Pakistan Army in collaboration with the Irrigation and C&W departments plays a substantial role in the opening of breaching sections and or breaching of bunds. During the unprecedented high floods in the Chenab River in 2014 various protection bunds and bridges had to be breached to protect the population in Multan and Jhang districts.
4. In case a disaster disrupts the existing telecommunication channels in a certain area, Pakistan Army would spearhead or assist the installation of wireless stations.
5. In case of high floods, the respective Corps Commanders would setup Flood Relief Committees, consisting of but not limited to Commander Corps Engineer, Commander Corps Signals, Chief of Staff, Colonel.

3.4.18 PAKISTAN METEOROLOGICAL DEPARTMENT

The primary function of this department is to provide an early warning of a natural hazard. This department continuously monitors various meteorological factors such as rainfall, temperature, atmospheric pressure, etc.

1. The department issues weather forecasts on a regular basis through electronic and print media and to all the concerned districts and provinces about any random change in weather pattern that can be a reason of concern. However some natural disasters are not possible to predict such as earthquakes and tornadoes.
2. The monsoon prediction for this year is that there will be a delayed monsoon and more drought like conditions may prevail in the Cholistan area. However floods have not been completely ruled out. This is mainly due to the fact that there have been pre monsoon rains and the two major dams i.e. the Tarbela and Mangla have already attained their full capacity. Therefore with little storage capacity any amount of monsoon rain can lead to flooding if not properly managed. However, as seen in the previous floods at times the amount of rain is not directly proportional with the flood waters in the rivers.
3. PDMA Punjab establishes a Flood Warning Center at MET office Lahore for better coordination and dissemination of timely information.

3.4.19 WATER AND POWER DEVELOPMENT AUTHORITY (WAPDA)

Ministry of Water and Power conducts periodic monitoring and inspection of dams and provides telemetric data from rain gauge stations and flood data from Indus River Basin, to the Flood Forecasting Division of the Pakistan Meteorological Department.

1. The Ministry also coordinates with the Indian counterpart to remain informed about the water levels in the shared water channels. The Water and Power Development Authority (WAPDA) collects and transmits rainfall and flood discharge data. This data is collected by Automatic Flood Telemetry Systems maintained by WAPDA.

3.4.20 FEDERAL FLOOD COMMISSION (FFC)

FFC is a federal department responsible for coordinating efforts aimed at reducing the risk of floods.

1. FFC reviews the capacity of flood protection works such as embankments and overcomes the shortcomings by enhancing the physical structures that preclude an over flow of waters from water channels such as rivers or canals.
2. FFC engages various contractors to remove the excessive silt in the canals and strengthen areas where a breach might occur.
3. FFC keeps providing PDMA with regular updates on the flow rates and volumes in different rivers of the Province.

ANNEXURES

ANNEXURE 1

NOTIFICATION: CABINET COMMITTEE TO REVIEW FLOOD ARRANGEMENTS



GOVERNMENT OF THE PUNJAB
SERVICES & GENERAL ADMINISTRATION
DEPARTMENT
(CABINET WING)

Dated Lahore, the 12th July, 2017

NOTIFICATION

No. SO(CAB-II)S-2/2017(2): In supersession of this department's Notification of even No. dated 22.06.2016, Chief Minister has been pleased to reconstitute the Cabinet Committee comprising the following to review flood arrangements:-

i.	Minister for P&D	Chairman
ii.	Minister for Disaster Management	Vice-Chairman
iii.	Minister for School Education	Member
iv.	Minister for Irrigation	Member
v.	Minister for Food	Member
vi.	Minister for Agriculture	Member
vii.	Minister for Industries	Member
viii.	Minister for Livestock	Member
ix.	Minister for SH & ME	Member
x.	Minister for P&SH	Member
xi.	Chief Secretary	Co-Vice Chairman
xii.	Senior Member, Board of Revenue	Member
xiii.	Addl. Chief Secretary Home	Member
xiv.	Inspector General of Police	Member
xv.	Secretary, C&W	Member
xvi.	Secretary, Irrigation	Member
xvii.	Secretary, Agriculture	Member
xviii.	Secretary, Information & Culture	Member
xix.	Secretary, SH & ME	Member
xx.	Secretary, P&SH	Member
xxi.	Secretary, L&DD	Member
xxii.	Secretary, LG & CD	Member
xxiii.	Director General PDMA	Secretary
xxiv.	Director, Civil Defence	Member
xxv.	Director General, Rescue 1122	Member
xxvi.	Rep. HQ & Corps Engineer	Member
xxvii.	Any other member co-opted by the Committee	

2. The Secretarial and logistic support to the Committee shall be provided by the office of DG, PDMA.

CAPT. (R) ZAHID SAEED
CHIEF SECRETARY

No. & DATE EVEN

A copy is forwarded for information and necessary action to:

1. All members of the Committee.
2. The Secretary to Chief Minister, Punjab
3. The Director General, Provincial Disaster Management Authority, Punjab.
4. The Additional Secretary (General) / Staff Officer to Chief Secretary, Punjab.
5. P.S. to Secretary (I&C), S&GAD.

(AHMAD RAZA BUTT)
SECTION OFFICER (CABINET-II)

PS to D.G. (PDMA)
Dy. No. 2121
Date 18-7-17

18/7/17
Sec. 18-01-17

Di 694

ANNEXURE 2

COMPENSATION POLICY



P D M A



Phone No.99210780-81

No. 513 -2017/ **631** /CR-I
GOVERNMENT OF THE PUNJAB
DISASTER MANAGEMENT
DEPARTMENT/PDMA
40-A, LAWRENCE ROAD

Lahore dated the **8th** July, 2017

To

All the Deputy Commissioners in the Punjab.

Subject:- **COMPENSATION TO BE GIVEN TO THE AFFECTEES OF NATURAL CALAMITIES.**

In supersession of all previous instructions on the subject, in pursuance of the Cabinet Committee meeting held on 29-6-2017, Chief Minister, Punjab has been pleased to revise the compensation rates to be given to the affectees of natural calamities in the province of Punjab, which are produced below for information and guidance for taking up the cases for grant of compensation with immediate effect except for loss of life which is w.e.f. 7th June, 2017:-

- | | | |
|------|---|--|
| i) | <u>Loss of Life</u>
For each person died due to natural calamity
Irrespective of the No. of causalities in a family | Rs.800,000/- |
| ii) | <u>Injured Persons</u>
(a) Critical serious injury (Permanent)
Disability or loss of limbs
(b) Serious/critical injury
(c) Minor Injured | Rs.300,000/-
Rs.100,000/-
Rs. 40,000/- |
| iii) | <u>Damage to House:</u>
a) House Completely
Damaged/Destroyed
b) House partially damaged
(depending upon the extent of damage) | Rs.100,000/-
Rs. 40,000/- |
| iv) | <u>Loss of Cattle Heads.</u>
Loss of Cattle Head (Milch and Draught
Animal Except Sheep and Goat) | Rs. 20,000/- |

2. Definitions for assessing claims and awarding compensation viz a viz Complete and Partial house damage and Minutes circulated to all Deputy Commissioners in the Punjab vide letter No.239-2017/421/CR-I, dated 17th May, 2017:

COMPLETELY DAMAGED HOUSE.

- (1) **For Single Room House / Unit:**
One or more (walls or roof) collapsed or are damaged to such an extent that the structure requires reconstruction of entire residential house.

(2) **For Houses having more than One Room:**

If a house comprises of more than one room, and more than one room is affected (either wall or roof or both) collapsed or damaged to an extent that it is not in a livable condition.

PARTIALLY DAMAGED HOUSE

(1) **For Single Room House / Unit:**

Roof of a residential house is in place and walls are damaged upto an extent of repair.

(2) **For Houses having more than One Room:**

If a house comprises of more than one room and only one room (either wall or roof or both) is collapsed or damaged, it will be considered as partially damaged.

GENERAL GUIDELINES:

1. If a house is shared with different brothers or family member(s) then, each will be considered as separate units, in case the incumbent is a separate head of family having different NADRA Family Number.
2. Any boundary wall, livestock shed, out-door toilets would not be considered part of the residential house.
3. The following District Committee will carry out survey in a transparent manner for assessment of completely/partially damaged houses:-

- i) ADC (Revenue)
- ii) Tehsildar / N Tehsildar (concerned)
- iii) Deputy Director Agriculture (Extension)
- iv) SDO Buildings (concerned)
- v) Any other member co-opted by Deputy Commissioner

Convenor
Member
Member
Member



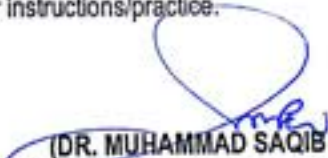
4. Bio Metric verification will be necessary for identification of the claimant before payment through NADRA.
5. Compensation will be paid only to the Head of the family after verification by District Administration.
6. House built/damaged in the River Bed Area would not be considered for compensation.

INSTRUCTIONS FOR PAYMENT OF COMPENSATION TO THE INJURED PERSONS.

- a) **INJURED PERSON (PERMANENT DISABILITY).** A person is permanently and totally disabled if he or she cannot engage in any substantial gainful activity because of a physical or mental level condition. A physician determines that the condition has been lasted or can be expected to last continuously for at least a year or can lead to death, it means that because of a sickness or injury a person is unable to work in their own or any occupation for which they are suited by training education or experience.
- b) **CRITICAL INJURED PATIENTS:-** Critically injured means an injury of a serious nature that -
 - a) Places life in jeopardy.
 - b) Produces unconsciousness
 - c) Results in substantial loss of blood
 - d) Involves the amputation of a leg or arm but not a finger or toe.
 - e) Involves the amputation of a leg, arm, hand or foot but not a finger or toe.
 - f) Consists of burns to a major portion of the body, or
 - g) Causes the loss of sight in any eye
- c) **MINOR INJURY:-** A minor injury is defined as a sprain, strain, whiplash associated disorder, contusion, abrasion, laceration or subluxation and any clinically associated sequelae.

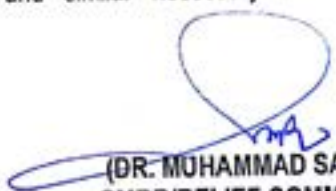
It was further decided that "Any injury needing hospital admission with the categorization Hospital admission by Medical Board and medical treatment of the injured persons due to natural calamity will be carried out in any Government Hospital free of cost till complete recovery on the recommendation of Medical Board."

3. It is, therefore, requested to please ensure that the above mentioned rates are followed in making recommendations for disbursement of compensation to the affectees of natural calamities. The procedure for disbursement of compensation will continue as per instructions/practice.


(DR. MUHAMMAD SAQIB AZIZ)
SMBR/RELIEF COMMISSIONER,
PUNJAB.

Even No. & Date

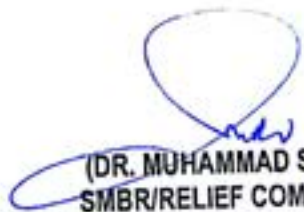
A copy is forwarded for information and similar necessary action to all the Commissioners of Divisions in the Punjab.


(DR. MUHAMMAD SAQIB AZIZ)
SMBR/RELIEF COMMISSIONER,
PUNJAB.

Even No. & Date

A copy is forwarded for information to:-

1. Malik Nadeem Kamran, Chairman, Cabinet Committee on Floods/Minister for P&D, Punjab, Lahore.
2. Mehr Ejaz Ahmed Achlana, Vice Chairman, Cabinet Committee on Floods/Minister for Disaster Management, Punjab, Lahore.
3. The Chief Secretary, Punjab, Lahore.
4. The Secretary to Chief Minister, Punjab, Lahore.
5. All administrative Secretaries in the Punjab.
6. All Divisional Commissioners in the Punjab


(DR. MUHAMMAD SAQIB AZIZ)
SMBR/RELIEF COMMISSIONER,
PUNJAB.



P D M A



BOARD OF REVENUE, PUNJAB
DISASTER MANAGEMENT
DEPARTMENT/PDMA
40-A, LAWRENCE ROAD

Lahore dated the 07th August, 2017.

NOTIFICATION

No. 594-2017/ 823 /CR-I. In compliance with the directions of the Cabinet Committee on Floods in its meeting held on 02-08-2017, the competent authority has been pleased to constitute a "District Committee" comprising of the following members in order to verify the genuineness of casualties/death compensation cases for payment of compensation in pursuance of instructions issued vide PDMA Punjab's letter No.513-2017/631/CR-I, dated 8-7-2017, during rains/floods:-

i.	Deputy Commissioner	Convenor
ii.	Mayor Metropolitan/Corporations/ Chairmen District Councils	Member
iii.	CEO District Health Authority	Member
iv.	A.C. of the concerned Tehsil	Member*
v.	DEO PES Rescue-1122 concerned.	Member

DR. MUHAMMAD SAQIB AZIZ
SENIOR MEMBER, BOARD OF REVENUE/
RELIEF COMMISSIONER, PUNJAB.

No. & Date Even.

A copy is forwarded for information and necessary action to :-

1. The Chief Secretary, Punjab.
2. All the Commissioners in the Punjab.
3. All the Deputy Commissioners in the Punjab
4. PSO to Minister for P&D/Punjab, Lahore
5. PSO to Minister for Disaster Management, Punjab, Lahore.
6. PS to D.G. PDMA, Punjab.


7/31/17
DIRECTOR (OPERATIONS)
Provincial Disaster Management Authority, Punjab

ANNEXURE 3

NOTIFICATION: CONSTITUTION OF DISTRICT DISASTER MANAGEMENT AUTHORITY

3

**BOARD OF REVENUE, PUNJAB
DISASTER MANAGEMENT
DEPARTMENT/PDMA
40-A LAWRENCE ROAD
Lahore dated 22nd June, 2017**

NOTIFICATION

No. 148-2017 / 185 / Admn-I In supersession of Notification No. 558-2011/ 836/Admn-I dated 29.08.2011 and in pursuance of promulgation of Punjab Local Government Act, 2013 (Act No. XVIII of 2013) and Civil Administration Ordinance 2016, Governor of the Punjab is pleased to reconstitute the District Disaster Management Authority (DDMA) in each district in the following manner:

1.	Deputy Commissioner	Chairperson
2.	Mayors of Metropolitan / Municipal Corporations	Member
3.	Chairmen District Councils	Member
4.	District Police Officer	Member
5.	Two elected representatives to be nominated by the Chief Minister for each DDMA	Member
6.	Two representatives of NGOs / Civil Society to be nominated by the Chair	Member
7.	CEO District Health Authority	Member
8.	CEO District Education Authority	Member
9.	Additional Director Livestock	Member
10.	Deputy Director Agriculture (Extension)	Member
11.	District Food Controller	Member
12.	SP / DSP Special Branch	Member
13.	Executive Engineer Irrigation	Member
14.	Executive Engineer Public Health	Member
15.	Executive Engineer Highways	Member
16.	Executive Engineer Buildings	Member
17.	District Emergency Officer (Rescue 1122)	Secretary
18.	Disaster Management Officer, Pakistan Red Crescent Society	Member
19.	All Chief Officers of Municipal Corporations/ Municipal Committees / District Councils	Member
20.	Federal Government Officers which the DDMA's decide to co-opt as per powers delegated under sections 20 & 22 of NDM Act 2010	Member

SMR / RELIEF COMMISSIONER /
SECRETARY TO GOVERNMENT OF THE PUNJAB
DISASTER MANAGEMENT DEPARTMENT

No. & Date Even

- A copy is forwarded for information to:
1. The Cabinet Secretary, Government of Pakistan, Cabinet Secretariat, Islamabad
 2. The Chairman, National Disaster Management Authority, Prime Minister's Secretariat, Islamabad

(Signature)
(DIRECTOR GENERAL) -
PROVINCIAL DISASTER MANAGEMENT AUTHORITY PUNJAB

ANNEXURE 4

**NOTIFICATIONS:
ADVISORY COMMITTEE,
DIVISIONAL AND DISTRICT
TECHNICAL COMMITTEES
FOR ASSESSMENT OF
DANGEROUS BUILDINGS**



**GOVERNMENT OF THE PUNJAB
PROVINCIAL DISASTER MANAGEMENT
AUTHORITY, PUNJAB**

Dated Lahore, the November 18TH, 2015

NOTIFICATION

No. 343-2015/263/Tech/Building : In pursuance of the directions of Chief Minister Punjab, the competent authority has been pleased to constitute an **Advisory Committee** comprising of following to design, conduct, supervise and review the survey of dangerous buildings, enforcement mechanism and legal regime:-

1.	Khawaja Ahmad Hassan, EX-Chairman LTC & LWMC	Convener
2.	Secretary C&W	Member
3.	Secretary LG & CD	Member
4.	Secretary HUD & PHED	Member
5.	Secretary Irrigation Department	Member
6.	Commissioner Gujranwala Division	Member
7.	Commissioner Sahiwal Division	Member
8.	Commissioner Lahore Division	Member
9.	CEO, The Urban Unit	Member
10.	DG Walled City Authority	Member
11.	DG LDA	Member
12.	DG PDMA	Member/Secretary
13.	Any other member (s) co-opted by the committee	Member

The terms of reference (TORs) of the committee are as under:-

- To devise design methodology and steering of survey of public and private dangerous buildings in the Province and to make policy recommendations.
- To revise the existing building laws of public and private sector and suggest necessary amendments for improvement if any and their effective implementation.
- To review the enforcement mechanism of legal regime of all concerned departments and propose an integrated, coherent and well-coordinated implementation strategy for enforcement of rules and regulation in true letter and spirit in this realm.
- To identify capacity gaps of each agency and recommend sustainable measures to enhance the engineering, human resource and technical capacity to cope with any major disaster.

(KHIZAR HAYAT GONDAL)
CHIEF SECRETARY, PUNJAB

No. & Date Even.

A copy is forwarded for information and necessary action to:-

1. SMBR/Relief Commissioner, Punjab
2. Secretary to Chief Minister, Punjab
3. All Administrative Secretaries to Government of Punjab.
4. All Divisional Commissioners in Punjab.
5. Additional Secretary (Staff) to Chief Secretary, Punjab.
6. All District Coordination Officers in Punjab.
7. All concerned departments of Federal Government

DIRECTOR GENERAL,
PDMA, PUNJAB



GOVERNMENT OF THE PUNJAB
PROVINCIAL DISASTER MANAGEMENT
AUTHORITY, PUNJAB

143

Dated Lahore, the November 30th, 2015

NOTIFICATION

No. 343 -2015/ 276 /Tech/Building : In pursuance of the directions of the Advisory Committee for assessment / survey of dangerous buildings in Punjab, the Competent Authority has been pleased to constitute the **Divisional Technical Committee** comprising of following to conduct, supervise, compile and review the survey of dangerous buildings, enforcement mechanism and take steps for remedial measures and legal action:-

1	Divisional Commissioner concerned	Convener
2	Superintending Engineer, Building Department	Member
3	Superintending Engineer, Highway Department	Member
4	Superintending Engineer, Irrigation Department	Member
5	Superintending Engineer, Public Health Department	Member
6	Superintending Engineer, Local Government Department	Member
7	Superintending Engineer, WAPDA	Member
8	Superintending Engineer, Pakistan Railways	Member
9	Superintending Engineer, Pak PWD	Member
10	Representative of the Urban Unit	Member
11	Chief Engineer, LDA/concerned Development Authority	Member
12	Any other member co-opted by the committee	Member

2. **Terms of Reference (TORs)** of the Divisional Technical Committee are as under:-

- Review / analyses of dangerous buildings data collected by HUD & PHED
- Action for evacuation, demolishing and major repair through concerned agency for the most dangerous buildings within one week under intimation to Provincial Advisory Committee.
- Collection and compilation of data for dangerous buildings
 - Public buildings
 - Public infrastructures
 - Private buildings
- Monthly progress to advisory committee and fortnightly meeting to review the progress and implementation status of decisions.
- Urban Unit shall conduct training session of Divisional Technical Committee for fresh survey of dangerous buildings through smart phone applications.
- To monitor and supervise the District Technical Committees working within respective Divisions.

DIRECTOR GENERAL
PDMA PUNJAB

No. & Date Even,

A copy is forwarded for information and necessary action to:-

- Chief Secretary, Government of the Punjab, Lahore.
- SMBR/Relief Commissioner, Punjab
- Secretary to Chief Minister, Punjab
- All Administrative Secretaries to Government of Punjab.
- All Divisional Commissioners in Punjab.
- All members of the Advisory Committee.
- Additional Secretary (Staff) to Chief Secretary, Punjab
- All District Coordination Officers in Punjab.
- All concerned Departments of Federal Government.
- P.S to DG, PDMA, Lahore.

20/11/2015
DIRECTOR (TECHNICAL)



GOVERNMENT OF THE PUNJAB
PROVINCIAL DISASTER MANAGEMENT
AUTHORITY, PUNJAB

Dated Lahore, the November 30th, 2015

NOTIFICATION

No. 343-2015/ 277 /Tech/Building : In pursuance of the directions of the Advisory Committee for assessment / survey of dangerous buildings in Punjab, the Competent Authority has been pleased to constitute the **District Technical Committee** comprising of following to conduct, supervise, compile and review the survey of dangerous buildings, enforcement mechanism and take steps for remedial measures and legal action:-

1	District Coordination Officer concerned	Convener
2	Executive Engineer, Building Department	Member
3	Executive Engineer, Highway Department	Member
4	Executive Engineer, Irrigation Department	Member
5	Executive Engineer, Public Health Department	Member
6	Executive Engineer, Local Government Department	Member
7	Executive Engineer, WAPDA	Member
8	Executive Engineer, Pakistan Railways	Member
9	Executive Engineer, Pak PWD	Member
10	Director Engineer, LDA/concerned Development Authority	Member
11	Any other member co-opted by the committee	Member

2. Terms of Reference (TORs) of the District Technical Committee are as under:-

- Review / analyses of dangerous buildings data collected by HUD & PHED
- Action for evacuation/ demolishing and major repair through concerned agency for the most dangerous buildings within one week under intimation to Divisional Technical Committee.
- Collection and compilation of data for dangerous buildings
 - Public buildings
 - Public infrastructures
 - Private buildings
- Monthly progress to Divisional Technical committee and fortnightly meeting to review the progress and implementation status of decisions.
- Urban Unit shall conduct training session of District Technical Committee for fresh survey of dangerous buildings through smart phone applications.
- To monitor and supervise the Survey Teams working within respective Districts.

DIRECTOR GENERAL
PDMA PUNJAB

No. & Date Even.

A copy is forwarded for information and necessary action to:-

1. Chief Secretary, Government of the Punjab, Lahore.
2. SMRR/Relief Commissioner, Punjab
3. Secretary to Chief Minister, Punjab
4. All Administrative Secretaries to Government of Punjab.
5. All Divisional Commissioners in Punjab.
6. All members of the Advisory Committee.
7. Additional Secretary (Staff) to Chief Secretary, Punjab
8. All District Coordination Officers in Punjab.
9. All concerned Departments of Federal Government.
10. P.S to DG, PDMA, Lahore.

DIRECTOR (TECHNICAL)



GOVERNMENT OF THE PUNJAB
PROVINCIAL DISASTER MANAGEMENT
AUTHORITY PUNJAB

Dated Lahore, the 04th July 2017

NOTIFICATION

No. 343 – 2015 / 59 / Tech / Building: In supersession of Notification No. 343 – 2015 / 277 / Tech / Building dated 30.11.2015 the **District Technical Committee** (to conduct, supervise, compile and review the survey of dangerous buildings, enforcement mechanism and taking steps for remedial measures and legal action) constituted in pursuance of the directions of the **Advisory Committee** for assessment / survey of dangerous buildings in Punjab has been reconstituted in the following manner:-

1.	Deputy Commissioner concerned	Convener
2.	Executive Engineer, Building Department	Member
3.	Executive Engineer, Highway Department	Member
4.	Executive Engineer, Irrigation Department	Member
5.	Executive Engineer, Public Health Engineering Department	Member
6.	Executive Engineer, Local Government Department	Member
7.	Executive Engineer, WAPDA	Member
8.	Executive Engineer, Pakistan Railways	Member
9.	Executive Engineer, Pak PWD	Member
10.	Director Engineer, LDA / concerned Development Authority	Member
11.	Deputy Director / Assistant Director Environment	Member
12.	Deputy Director Social Welfare	Member
13.	Assistant Director Labour	Member
14.	District Officer Industries, Crisis, Weights & Measures	Member
15.	Any other member co-opted by the Committee	Member

2. **Terms of Reference (TORs) of the District Technical Committee** are as under:-

- Review / analysis of dangerous buildings data collected by HUD & PHED.
- Action for evacuation/ demolishing and major repair through concerned agency for the most dangerous buildings within one week under intimation to Divisional Technical Committee.
- Collection and compilation of data for dangerous buildings.
 - Public buildings
 - Public infrastructures
 - Private buildings
- Monthly progress to Divisional Technical Committee and fortnightly meeting to review the progress and implementation status of decisions.
- Urban Unit shall conduct training session of District Technical Committee for fresh survey of dangerous buildings through smart phone applications.
- To monitor and supervise the Survey Teams working within respective Districts.

(DIRECTOR GENERAL)
PROVINCIAL DISASTER MANAGEMENT AUTHORITY PUNJAB

No & Date Even

- A copy is forwarded for information and necessary action to:-
- Chief Secretary, Government of the Punjab, Lahore.
 - SMBR/Relief Commissioner, Punjab
 - All Administrative Secretaries to Government of Punjab.
 - All Divisional Commissioners in Punjab.
 - All members of the Advisory Committee.
 - All Deputy Commissioners in Punjab.
 - All concerned Departments of Federal Government.
 - P.S to Minister for Disaster Management.
 - P.S to DG, PDMA, Lahore.


ASSISTANT DIRECTOR (TECHNICAL)
PROVINCIAL DISASTER MANAGEMENT AUTHORITY PUNJAB

ANNEXURE 5

GUIDELINES / TORs / SOPs FOR DISPOSAL OF FOOD HAMPERS

GOVERNMENT OF THE PUNJAB
DISASTER MANAGEMENT
DEPARTMENT/PDMA
40-A LAWRENCE ROAD LAHORE
Lahore dated the 10th May, 2018

NOTIFICATION

No.112-2018/ 258 / CR-I. In pursuance of the decision taken by the Cabinet Committee on Floods in its meeting held on 07.03.2018, under the Chairmanship of Minister for Planning & Development, Government of the Punjab / Chairman Cabinet Committee on Floods, following guidelines for disposal of Food Hampers / Food Items by the District Disaster Management Authorities (DDMAs) in Punjab are notified.

GUIDELINES / TORS / SOPS FOR DISPOSAL OF FOOD HAMPERS / FOOD ITEMS BY THE DISTRICT DISASTER MANAGEMENT AUTHORITIES (DDMAS) IN PUNJAB

1. All Deputy Commissioners as Chairmen of the District Disaster Management Authorities (DDMAs) reconstituted under Notification No. 149-2017 / 186 / Admn-I dated 22.08.2017 shall ensure timely distribution of all the Food Hampers / Food Items to the affectees of any disaster / emergency.
2. All District Disaster Management Authorities (DDMAs) of the respective districts may convene a separate meeting of the DDMA and present the issue of disposal of Food Hampers / Food Items before the members of the DDMA and decide the cases of disposal of Food Items / Food Hampers rendered in excess and after approval of the DDMA, may decide the fate of the excess Food Hampers / Food Items accordingly.
3. In case Food Items / Food Hampers remain undistributed due to less number of affectees, excess quantity of food hampers / food items or any other reason as the case may be (reasons to be recorded in writing); then a meeting of the District Disaster Management Authority (DDMA) shall be convened and decision shall be taken vis-à-vis disposal of Food Hampers / Food Items in respect to the distribution of the leftover Food Hampers / Food Items to be distributed amongst the poorest of the poor / most deserving populations either amongst BISP card holders or the beneficiaries of District Zakat holders or as decided by the District Disaster Management Authority (DDMA) through a well-documented and transparent procedure.
4. Before disposing off the undistributed Food Hampers / Food Items, the District Disaster Management Authority (DDMA) shall ensure that all Food Items / Food Hampers are fit for human consumption. This issue will not arise if Food Items / Food Hampers are distributed timely, however, in case these Food Hampers / Food Items remained unused for more than a year, the safety becomes compromised due to their perishable nature.
5. In such cases where certainty of Food Items / Food Hampers is compromised, all such items including packed items like dry milk, tea, packed chilly etc. on which the dates of expiry are mentioned should be strictly adhered to and in case date is expired the same shall be destroyed.

6. In case of food items where date of expiry is not mentioned like rice, pulses, roasted channa, atta and etc, the same should be subjected to Laboratory test and after the laboratory test reports, should be subjected to fate on the basis of the following:
 - a. If found fit for human consumption, the same should be immediately distributed amongst the deserving population as mentioned at Serial No. 3.
 - b. If found fit for animal consumption, the same should be immediately given to the animals after taking due input of the Livestock & Dairy Development Department.
 - c. If found unfit for both the same shall be disposed off / destroyed accordingly.
7. In case any food item is declared unfit for human / animal consumption or found expired as per the date of expiry mentioned, the same should be destroyed immediately.
8. All the aforementioned action(s), if required to be taken, should be properly documented in form of minutes by the concerned District Disaster Management Authorities (DDMAs).

DIRECTOR GENERAL
PROVINCIAL DISASTER MANAGEMENT AUTHORITY
PUNJAB

No & Date Even

1. The Chief Secretary Punjab
2. The Additional Chief Secretary Punjab
3. The Chairman P&D
4. The Secretary to Chief Minister Punjab
5. All Administrative Secretaries to Government of the Punjab
6. PPO / Inspector General of Punjab
7. All Commissioners in Punjab
8. Member (Operations), NDMA
9. All Deputy Commissioners / Chairmen DDMAs in Punjab
10. Director General Public Relations, Punjab
11. Director General PES(Rescue 1122)
12. Director Civil Defence Lahore
13. PSO to the Chairman NDMA
14. PSO to Minister for P&D / Chairman Cabinet Committee on Floods
15. PSO to Minister for Disaster Management Department
16. PSO to SMBR / Relief Commissioner Punjab
17. PS to DG PDMA
18. PAs to Director PDMA / Director (Technical), PDMA


DIRECTOR (OPERATIONS)
(Provincial Disaster Management Authority Punjab)

ANNEXURE 6

NOTIFICATION: DISTRICT FIRE SAFETY COMMITTEE

**GOVERNMENT OF THE PUNJAB
DISASTER MANAGEMENT
DEPARTMENT/PDMA
40-A LAWRENCE ROAD LAHORE
Lahore dated the 23rd February, 2017**

NOTIFICATION

No. 50-2017/20/Tech (Building). In pursuance of the decision taken by the Provincial Disaster Management Authority Punjab in its 1st meeting (2017), dated 20.01.2017, under the Chairmanship of SMBR / Relief Commissioner Punjab, the following **District Fire Safety Committees** have been constituted for ensuring the implementation of the recommendations of the Fire Safety Commission (FSC) constituted by the Hon'able Lahore High Court Lahore vide Order dated 01.03.2013 passed in Writ Petition No. 1619/2013.

CONSTITUTION OF DISTRICT FIRE SAFETY COMMITTEE (DFSC)

The District Fire Safety Committee (DFSC) will comprise the following in each District of Punjab.

I.	Deputy Commissioner	Chairperson
II.	District Emergency Officer (Rescue 1122).	Secretary
III.	All Assistant Commissioner of District	Member
IV.	All SDPOs in District	Member
V.	DO Civil Defence	Member
VI.	A representative of each District Council / Municipal Committee/Body or Development Authority (such as LDA)	Member

TORs OF DISTRICT FIRE SAFETY COMMITTEE (DFSC)

- I. The Director General PDMA and DG PES (Rescue 1122) will be responsible for overall supervision and monitoring of the District Fire Safety Committees and all DFSCs will report to them.
- II. The District Fire Safety Committee in each District will visit all high rise buildings above 38 feet and ensure following Fire Safety Commission's recommendations communicated through the Hon'able Lahore High Court Lahore in W.P.No. 1619/2013.

a. Installation of External Staircases

External staircases must be installed at all high-rise buildings above 38 feet for safe evacuation, where exits are not already available. Buildings having over 10,000 square feet of covered area must have a minimum of 2 external staircases, with one on each

side of the building and with a maximum travel distance to an emergency exit not more than 100 feet.

b. Provision of Fire Doors opening outwards

Emergency staircases must be separated from the main building by preferably two fire doors opening outwards. The fire doors shall be of hinge type with clear width of at least 3 feet and minimum of one hour fire resistant rating. Overhead or sliding doors must not be installed.

c. Provision of external or internal Pressurized Hydrant System

All high-rise buildings must have an external or internal pressurized hydrant system running along the exit staircases comprising of a minimum 4-inch diameter pipes with pressure gauge valves and 2.5-inch outlets with Delivery Hose and Branch Pipe for use by rescue service and 1.5-inch diameter long-life rubber hose stored in an insulated fire cabinet installed near the exit for occupants use on each floor/strategic locations. The hydrant system should have an independent power supply supporting the pumping systems.

All multistorey buildings, having 4 to 10 floors shall have an independent overhead water tank of minimum 7,500 gallons capacity or an external underground tank of 15,000 gallons to support the hydrant system. In case a building is more than 10 stories high, it shall have an independent overhead tank of 15,000 gallons and external underground tank of minimum 30,000 gallons. The external underground tank of all buildings should be accessible to rescue and fire services and vehicles at all times.

d. Installation of Fire Extinguishers

All high-rise buildings should install fire extinguishers in line with NFPA 10 for meeting immediate needs. Fire extinguishers should be provided in the following pairs:

- i) One multipurpose (A,B,C) dry chemical powder 6kg fire extinguisher and one Water Type Stored pressure extinguisher of 9 liters for each 2000 square feet of covered area ;or
- ii) One CO2 (minimum 4kg) fire extinguisher and one Water Type Stored Pressure extinguisher of 9 liters for each 2000 square feet of covered area.

e. Installation of Fire Alarm System

With a prescribed time-frame, all high-rise buildings must ensure installation of fire alarms as installed in other safety compliant buildings. As a second phase and within a prescribed time-frame, all high-rise buildings shall provide for a comprehensive intelligent fire detection and alarm system with relevant detectors at all locations with the buildings.

f. Provision of free and clear access for emergency vehicles / removal of obstruction

High-rise buildings ensure that free and clear access for emergency vehicles be provided around the buildings. This access must be free from overhead obstruction

(Wires, cables etc.) and the windows of all floors must be of an appropriate size to allow for emergency evacuation. It is essential to ensure security with safety and accordingly the security measures around the high rise buildings must be reviewed so as to allow free access to the buildings for emergency vehicles.

g. Preparation and Display of Emergency Evacuation Plans and Emergency Lighting System

All high-rise buildings must prominently display evacuation plans at their entrances. The exit signs must be clearly legible and printed of fluorescent material guiding towards emergency exits. Assembly areas must immediately be earmarked in all high-rise buildings and evacuation drills conducted on a regular basis.

h. Constitution of Emergency Response Team with a dedicated Building Safety Manager

Every high-rise building should have a Building Safety Manager with a designated Emergency Response Team to ensure implementation of the FSC's recommendations and ensure prompt evacuation at the hour of need. The designated manager and his emergency team should be trained by Rescue 1122 and Civil Defence.

- III. Apart from high rise buildings, these Fire Safety Protocols need to be implemented by all Public Sector Buildings and Private Sector Hotels.
- IV. District Fire Safety Committees will visit all such buildings on quarterly basis and submit reports to DG PDMA and DG PES (Rescue 1122).
- V. DG PDMA shall submit the reports before the Provincial Disaster Management Authority (PDMA) Punjab to ensure that appropriate steps are taken for Disaster Risk Reduction.

**SMBR / RELIEF COMMISSIONER /
CHAIRMAN PROVINCIAL DISASTER
MANAGEMENT AUTHORITY PUNJAB**

No & Date Even

1. The Chairman, NDMA
2. The Chief Secretary Punjab
3. The Additional Chief Secretary Punjab
4. The Chairman P&D
5. The Secretary to Chief Minister Punjab
6. All Administrative Secretaries to Government of the Punjab
7. PPO / Inspector General of Punjab
8. All Commissioners in Punjab
9. CCPO Lahore
10. All Deputy Commissioners in Punjab
11. All CPOs and DPOs in Punjab
12. Director General Public Relations, Punjab
13. Director General PES (Rescue 1122)
14. Director Civil Defence Lahore
15. PSO to Minister for Disaster Management Department
16. PSO to SMBR / Relief Commissioner

17. PS to DG PDMA

18. PAs to Director PDMA / Director (Operations), PDMA / Director (Technical), PDMA



DIRECTOR

(Provincial Disaster Management Authority)

No & Date Even (For Information)

1. The Registrar Lahore High Court Lahore
2. The Advocate General Punjab
3. Mr. Rafay Alam Advocate, Secretary Fire Safety Commission constituted by Hon'able Lahore High Court Lahore vide W.P.No. 1619/2013



DIRECTOR

(Provincial Disaster Management Authority)

ANNEXURE 7

CONTACT DETAILS OF DEPUTY COMMISSIONERS & ADDITIONAL DEPUTY COMMISSIONERS

DEPUTY COMMISSIONERS IN THE PUNJAB

Sr. No.	Designation	Name/ Address	Telephone Office	Tele.Residence	Fax. No
1	D.C Bahawalpur Code - 062	Rana Muhammad Saleem Afzal dcobahawalpur@punjab.gov.pk	9250492 9250494	9250063 0341-0922083	9250493
2	D.C Bahawalnagar Code-063	Mr. Muhammad Azhar Hayat dcobwn@gmail.com	9240201-2	9240201-03 0304-0920084	9240204
3	D.C Rahim Yar Khan Code-068	Socrat Aman Rana dcorykhan@punjab.gov.pk	9230266 9230233	9230277-78 0304-0920085	9230267
4	D.C Dera Ghazi Khan Code-064	Mr. Muhammad Ibrahim Junaid	9260340	9260341 0304-0920090	9260349 9260113
5	D.C Layyah Code-0606	Mr. Wajid Ali Shah dcolayyah@punjab.gov.pk	920103-4	413705 0304-0920092	920102
6	D.C Muzaffargarh Code-066	Muhammad Saif Anwar Jappa dcmuzaffargarh@gmail.com	9200251-52	9200254 0304-0920091	9200253
7	D.C Rajanpur Code-0604	Mr. Ishfaq Ahmed Ch. dcorajanpur@gmail.com	920001	920002 0304-0920093	920003
8	D.C Faisalabad Code-041	Mr. Salman Ghani dcofaisalabad@punjabgov.pk	9200205 9200206	9200208-9 0301-8662426	9200156
9	D.C Chiniot Code-047	Muhammad Ayub Khan dcochiniot@punjab.gov.pk	9210111 9210101	9200201 0304-0920080	9210110 9210109
10	D.C Jhang Code-047	Mr. Mudassar Riaz Malik dcojhang@punjab.gov.pk	9200081	510659 0304-0920079	9200100
11	D.C T.T Singh Code-046	Mr. Irfan Nawaz Memon dcottsing@punjab.gov.pk snattsingh@punjab.gov.pk	9201001 2515922	9200024-25 0304-0920064	9201004 516040
12	D.C Gujranwala Code-055	Mr. Umar Jahangir	9200051-52 9200043	9200024-25 0304-0920064	9200043 9200024-25
13	D.C Gujrat Code-053	Muhammad Ali Randhawa dcogujrat@punjab.gov.pk	9260010-100 9260066	9260011 0304-0920066	9260009 9260014 ®
14	D.C Hafizabad Code-0547	Ms. Saleha Saeed	521784 524085	521075 0304-0920069	521075 521784
15	D.C Mandi Bahauddin Code- 0546	Hafiz Shaukat Ali dembdin@punjab.gov.pk	504220	504200 0304-0920068	504100 500987
16	D.C Narowal Code- 0542	Mr. Ali Anan Qamar dconwl@punjab.gov.pk	920010 920020	92121-2 0304-0920067	920300
17	D.C Sialkot Code- 052	Dr. Farrukh Naveed dcosialkot@hotmail.com	9250451-2	9250454 0304-0920065	9250453
18	D.C Lahore Code-042	Mr. Sumair Ahmed Syed 0323-8447950	99211003-4 0304-0920060	99200201-2 0300-8447950	99211006

DEPUTY COMMISSIONERS IN THE PUNJAB

Sr. No.	Designation	Name/Address	Telephone Office	Tele. Residence	Fax. No
19	D.C Kasur Code- 049	Ms. Saira Umer	9250067 9250143	9250140 0304-0920062	9250162
20	D.C Nankana Sahib Code- 056	Malik Abdul Waheed dconankana@punjab.gov.pk	920110-11	9201014 0322-8887859	9201015
21	D.C Sheikhpura Code-056	Mr. Arqam Tariq dcosheikhpura@gmail.com	9200150-2	9200153-4 0304-0920061	9200152
22	D.C Multan Code-061	Mr. Zahid Saleem Gondal dco.multan.it@gmail.com	9200042-43	9200045-724 0304-0920081	9200725
23	D.C Khanewal Code- 065	Mr. Muzaffar Khan Sial dcokhanewal@gmail.com	9200032	9200031 0304-090082	9200033
24	D.C Lodhran Code- 0608	Raja Khuram Shahzad dcolodhran@gmail.com	9200066	9200200 0304-0920088	9200077
25	D.C Vehari Code- 067	Mr. Ali Akbar Bhatti dcovehari@punjab.gov.pk	3362122 3363488	3363477-78 0304-0920094	3363688 3363478 ®
26	D.C Rawalpindi Code- 051	Mr. Talat Mehmood Gondal dcpindi@gmail.com	9292530 9292531	9292732-33 0304-0920070	9292529
27	D.C Attock Code- 057	Rana Akb ar Hayat pccsattock@gmail.com	9316010	931601-12 0304-0920072	9316011
28	D.C Chakwal Code- 0543	Mr. Ghulam Saghir Shahid dco.chakwal@gmail.com	660001 660003	660100 0304-0920073	660106 660250
29	D.C Jhelum Code- 0544	Capt.(Rtd) Abdul Sattar dco.jhelum@gmail.com	9270081	9270082 0304-0920071	9270086 9270083
30	D.C Sahiwal Code- 040	Mr. Shaukat Ali Khichi dcosahiwal@gmail.com	9200060-61	9200064 0304-0920086	9200062
31	D.C Okara Code- 044	Dr. Muhammad Irshad	9200025 9200026	0341-0920063	9200032
32	D.C Pakpattan Code- 0457	Mr. Raja Mansoor Ahmed	374198 373033	0304-0920087	371035
33	D.C Sargodha Code- 048	Mr. Liaqat Ali Chattha dscosargodha@punjab.gov.pk	9230025-26	9200388 0304-0920077	9230024 9230046 ®
34	D.C Bhakkar Code- 0453	Syed Bilal Haider dcobhakkar@punjab.gov.pk	9200188 9200288	9200388 0304-0920077	9200160-1
35	D.C Khushab Code- 0454	Mr. Amjad Bashir dcokhushab@punjab.gov.pk	920202 720626	720470 0304-0920075	920204
36	D.C Mianwali Code- 0459	Mr. Shozeb Saeed dcomianwali@gmail.com	234300	232555 0304-0920076	234895

LIST OF ADDITIONAL DEPUTY COMMISSIONERS IN THE PUNJAB

Sr. No	Name	District	Office No.	Cell No	Fax No
1	Mr. Ikram-ul-Haq	Attock	057-9316013	0312-5204289	057-9316022
2	Mr. Tariq Mehmood Bukhari	Bahawalnagar	063-9240209	0333-6489999	063-9240210
3	Imrana Ajmal	Bahawaplur	062-9250046	0323-6502114	062-9250041
4	Hafiz Ahmed Tariq	Bhakkar	0453-9200396	0332-4561399	0453-9200398
5	Muhammad Asim Javed	Chakwal	0543-660102	0300-4229255	0543-660250
6	Mr. Sana Ullah	Chiniot	047-6332338	0300-4640021	047-9210097
7	Mr. Abdul Shakoor	D.G Khan	064-9260334	0333-8569248	
8	Mr. Khawar Ijaz Khaliq	Faisalabad	041-9200306	0333-7373737	041-9200298
9	Mr. Tariq Qureshi	Gujranwala	055-9200034	0340-0002951	055-9200039
10	Mr. Irfan Ali Khatia	Gujrat	053-9260061		053-9260062
11	Mr. Munawar Hafeez	Hafizabad	0547-524338	0333-8158387	0547-526171
12	Mr. Abdul Qadir Shah	Jhang	047-9200107-110	0300-5900722	
13	Mr. Imran Raza Abbasi	Jhelum	0544-9270102	0333-4146777	0544-9270371
14	Muhammad Shahid Khan	Kasur	049-9250099	0300-5819570	
15	Mr. Ishfaq Ahmed Ch.	Khanewal	065-9200069	0300-8780143	065-9200033
16	Rao Atif Raza	Khushab	0454-920120	0300-6048343	0454-920218
17	Mr. Ifran Nawaz Memon	Lahore	042-99210614-15	0345-4014701	042-99210632
18	Dr. Lubna Nazir	Layyah	0606-920107	0300-4989307	0606-920102
19	Dr. Javed Ahmed	Lodhran	0608-9200120	0300-6461115	0608-9200121
20	Mr. Afzal Ahmed Warraich	M.B Din	0546-506488	0300-7239250	0546-504100
21	Mr. Ghulam Mustafa	Mianwali	0459-235005	0300-9460973	0459-234895
22	Mr. Manzar Javed Ali	Multan	061-9200073	0334-9998877	061-9200976
23	Mr. Ijaz Munir	Muzaffargarh	066-9200264	0300-6550400	066-9200259
24	Mr. Tariq Kareem Khokhar	Narowal	0542-920063	0300-4914911	
25	Dr. Shahzeb Hasnain	Nankana Sahib	056-9201080	0333-4591013	056-2877061
26	Muhammad Riaz	Okara	044-9200251	0300-9348113	044-9200248
27	Mr. Arif Umar Aziz	Pakpattan	0457-352725	0333-8013524	0457-371279
28	Mr. Shozeb Saeed	R.Y Khan	068-9230226	0300-8670463	068-9230331
29	Mr. Abdul Fateh Halio	Rajanpur	0604-689282	0344-2710274	0604-689288
30	Mr. Arif Raheem	Rawalpindi	051-9292528	0300-8482212	051-9292527
31	Mr. Kashif Muhammad Ali	Sahiwal	040-9200078	0300-6301838	040-9200076
32	Mr. Farooq Rasheed Sindhu	Sargodha	048-9230255-56	0300-9440106	
33	Mr. Rao Riaz Ijaz	Sheikhupura	056-9200163	0345-9262101	056-9200164
34	Muhammad Umer Sher	Sialkot	052-9250466	0333-4573308	
35	Mr. Zeshan Shabbir Rana	T.T Singh	046-9201011	0300-8525277	
36	Rana Saleem Ahmed	Vehari	067-3364063	0301-8683222	067-3363514

ANNEXURE 8

CONTACT DETAILS OF PUNJAB EMERGENCY SERVICES OFFICERS

PUNJAB EMERGENCY SERVICES (RESCUE 1122)

DISTRICT EMERGENCY OFFICERS NUMBERS

Sr. No	Name	District	Cell No.
1	Dr. Ashfaq Mian	Attock	0300-5124877
2	Engr. Rao Sharafat Ali	Bahawalnagar	0302-4219300
3	Dr. Asif Reheem	Bahawalpur	0321-6807001
4	Engr. Naveed Iqbal	Bhakkar	0300-4434543
5	Dr. Ateeq Ahmed Khan	Chakwal	0336-0001188
6	Tahira Khan	Chiniot	0300-4179020
7	Dr. Muhammad Natiq Hayat	D.G Khan	0333-6475473
8	Engr. Ehtisham	Faisalabad	0333-8881122
9	Engr. Omar Akbar Ali Ghuman	Gujranwala	(03336517115) (03059911224)
10	Engr. Muhammad Naeem Akhtar	Gujrat	0300-8074275
11	Engr. Sibghat Ullah	Hafizabad	0333-4175110
12	Engr. Ali Hussain	Jhang	0321-8666993
13	Dr. Faisal Mehmood	Jhelum	0345-0313-7308299
14	Dr. Farzand Ali	Kasur	0300-4355396
15	Dr. Ijaz Anjum	Khanewal	0333-7621122
16	Dr. Muhammad Nayyar Alam	Khushab	0331-8627686
17	Mr. Shahid Waheed Qamar	Lahore	0321-4090063
18	Dr. Sajjad Ahmed	Layyah	0300-4512364
19	Mr. Muhammad Baqir Hussain	Lodhran	0332-6531122
20	Engr. Imran Khan	M.B Din	(03215141122) (03225444467)
21	Engineer Obaid Ullah	Mianwali	0333-6175736
22	Dr. Kaleem Ullah	Multan	0323-4018426
23	Dr. Irshad Ul Haq	Muzaffargarh	(03216871122) (03334238012)
24	Engr. Adnan Nawaz	Narowal	0333-8646254
25	Dr. Muhammad Akram	Nankana Sahib	0333-8641122
26	Dr. Zafar Iqbal	Okara	0333-4044279
27	Dr. Tahir Mehmmod	Pakpattan	0344-6730994
28	Dr. Abdul Sattar	R.Y Khan	0332-4321122
29	Dr. Muhammad Aslam	Rajanpur	0333-7627166
30	Dr. Abdul Rahman	Rawalpindi	0333-4471122
31	Dr. Khalid Abdullah	Sahiwal	0300-9443288
32	Mr. Mazhar Shah	Sargodha	(03337861122) (03334461122)
33	Mr. Rana Ijaz Ahmed	Sheikhupura	0336-4441122
34	Syed Kamal Abid	Sialkot	0301-8616077
35	Engr. Mian Faraz Munir	T.T Singh	0331-7771122
36	Engr. Danish Khalil	Vehari	0333-5154346

ANNEXURE 9

RAINFALL STATEMENTS FOR YEAR 2017

RAINFALL (MM) STATEMENT FOR THE MONTH OF JUNE - 2017

Punjab-Stations	1	2	3	4	5	6	7	8	9	10	11	12	13
1 BAHAWALNAGAR	0	0	0	0	0	0	0.01	0	0	0	0.01	0	0
2 BAHAWALPUR,CITY	1	0	0	0	0	0	0	5	2	0	7	0	0
3 BAHAWALPUR,AIRPORT	0.01	0	0	0	0	0	0	27	0	0	2	0	0
4 BHAKKAR	0	0	0	0	0	0	15	0	0.01	0	2	0	0.01
5 CHAKWAL	2.4	0	0	0	0	0	9.2	0	17	0	63	0	0
6 D.G.KHAN	0	0	0	0	0	0	0.01	0	0	0	1	0	0
7 FAISALABAD	0	0	0	0	0	0	12	0	0	0	18.8	0	6
8 ISLAMABAD,AIRPORT	0	0	0	0	0	6	4	0	15	0	0	0	3
9 ISLAMABAD,ZEROPOINT	0	0	0	0	0	6	1	0	17.9	0	0	0	0
14 JHANG	0	0	0	0	0	1	2.4	0	0	0	4	0	0
15 JOHARABAD	0	0	0	0	0	0	0.01	6	0	0	2.6	0	0.01
16 JHELMUM	3	0	0	0	0	0	5.1	0	8.6	0	2	0	0
17 KASUR	0.01	0	0	0	0	0	25	0	0	0	10.2	0	0
18 KHANPUR	0	0	0	0	0	0	0	0.1	0	0	0	0	0
19 KOT ADDU	0	0	0	0	0	0	0	0	0	0	2	0	1
20 KAMRA	0.01	0	0	0	0	2	1	0	0	0	0	0	0
21 LAHORE, AIRPORT	0	0	0	0	0	0	9	0	40	0	8	0	0
22 LAHORE,CITY	0.01	0	0	0	0	0	10.4	0	51	0	3.8	0	0
37 LAYYAH	0	0	0	0	0	0	0	0	10	0	0	0	0
38 MANDIBAHAUDDIN	7	0	0	0	0	0	0.01	0	0.01	0	6	0	0
39 MIANWALI	0	0	0	0	0	0	0	0	0	0	0	0	0.01
40 MULTAN	0	0	0	0	0	0	0	0	2.4	0	25	0	1.3
41 MANGLA	8	0	0	0	0	0.01	10	0	13.6	0	3	0	1.6
42 MURREE	0	0	0	0	0	26	11	0	21	0	11	0	0
43 NOORPUR THAL	0	0	0	0	0	0	5	0	1	0	1	0	0
44 OKARA	0	0	0	0	0	0	19	0	0	0	11	0	0
45 RAHIM YAR KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0
46 GUJRANWALA	1.6	0	0	0	0	0	0	0	41	0	0.01	0	0
47 GUJRAT	0	0	0	0	0	0	0	0	11.2	11.2	0.01	0	0
48 SAHIWAL	0	0	0	0	0	0	29	0	0	0	16	0	0
49 SARGODHA A/P	0	0	0	0	0	0.01	1	0	0	0	21	0	0
50 SHORKOT	0	0	0	0	0	0	4	0	0	0	7	0	0
51 SIALKOT CANTT	0.7	0	0	0	0	0	0	0	1.7	0	0	0	0
52 SIALKOT AIRPORT	4.2	0	0	0	0	0.01	0	0	3.6	0	0.5	0	0
53 T.T. SINGH	0	0	0	0	0	0	20.3	0	0	0	0	0	0

■ Indicates daily highest rainfall

■ No rain through out the region

RAINFALL (MM) STATEMENT FOR THE MONTH OF JUNE - 2017

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
0	5	0	0	0	0	2	4	16	0	0	0	0	10	0	0	0	37.02
0	0	0	0	0	0	17	17	17	0	0	0	0	0	0.1	0	0	66.10
0	0	0	0	0	0	6	45.3	64.4	0.6	0	0	0	0	0	0	0	145.31
0	0	0	0	1	0	0	8	0	0	0	0	0	48	0	0.01	0	74.03
0	3	0	14	0	0	0	4.2	0.8	0	0	0	0	0	14.8	34.6	0	163.00
3	4	0	0	0.01	0.01	9	21	1	0	0	0	0	0	1	0	0	40.03
0	0	0	0	0	0	0	39	0	0	0	0	0	0	4	3.4	0	77.20
6	0	0	11	0	0	10	1	0.01	0	0	0	30	1	4	39	0	133.01
0	0	0	8	0	2	20	0.01	0.01	0	0	0	58	2	2	26	0.01	145.93
0	0.01	0	0	0	0	0	21.7	0	0	0	0	0	0	109	1	0	139.11
0	0	0	0	0	0	0	6.2	0	0	0	0	0	0	12.6	1	0	28.41
0	2	0.01	1	1	0.01	12.6	19.6	17	0	0	0	0	0	14.5	0.4	0.4	87.23
0	0	0	0	15	0	9.2	18	0	0.01	0	0	0	0	0.01	28	3.2	108.63
0	0	0	0	8	0.01	0	28.4	1	0	0	0	0	0	5.1	0	0	42.61
0	0	0	0	0	0.01	1.8	12.6	0	0	0	0	0	19	0	0	0	35.41
0	0	0	1	0	0	0	10	0.01	0	0	0	4	20	0	0.3	0	39.32
0	0	0.01	0	25	0	6	16	0.01	0	0	0	0	0	12	8.9	5	129.92
0	0	0	0	25	0	17.4	23.2	0.01	0	0	0	0	0	13	54.4	3	201.22
0	0	0	0	0.01	0	0	2	0	0	0	0	0	0	6	0	0	18.01
0	0	0	5	5	0	4	39.2	0.01	0	0	0	0	0	0	0.2	0.01	66.44
0	0	0	8	0	0	3	7	0	0	0	0	0	6	4	0	0	28.01
0	0	0	0	6	0.01	2	34	5	0.01	0	0	0	0	6	0.01	0.01	81.74
0	3	0	4.3	0.01	0	23.6	15	8	0	0	0	0	0	52.2	4.3	0	146.62
0.01	0.01	9	0	0	2	34.5	12	4.6	0	0	0	18	0.3	0	5	58.4	212.82
0	2	0	0	0	0	0	53	0	0	0	0	0	0	63	1	0	126.00
0	0	0	0	0	0	3	43	0	0	0	0	0	0	10.4	0.01	0	86.41
0	0	0	0	0	0	0	34	0	0	0	0	0	0	15	0	0	49.00
0	0	4.4	17.5	4	7.4	7.6	53.7	3	0	0	0	0	0	0.8	8.8	7.3	157.11
0	4	5.2	6.6	2	5	16.6	32.8	0	0	0	0	0	0	16	14	9.2	133.81
0	3	0	0	0	0	0.01	10	0.01	0.01	0	0	0	0.01	49	0	0	107.04
0	0	0	0	0	0	0.01	5	0	0	0	0	0	0	21	4	0	52.02
0	0.01	0	0	0	0	0.01	26	0.01	0	0	0	0	0	30	2	0	69.03
0	0.01	4	0	0.01	11.7	27	13.2	18	0	0	0	0	0.01	0	24	34	134.33
0	1	4.8	19.2	0	0.8	29.6	20.6	21.6	0	0	0	0	0	0	20	6.8	132.71
0	16	0	0	0	0	0	24.8	0	0	0	0	0	0	28.6	2	0	91.70

RAINFALL (MM) STATEMENT FOR THE MONTH OF JULY - 2017

Punjab-Stations	1	2	3	4	5	6	7	8	9	10	11	12	13
1 BAHAWALNAGAR	0	0	0	0	0	0	9	0	0	0	0	0	0
2 BAHAWALPUR,CITY	0	0	0	0	0	0	2	0	0	0	0	0	0
3 BAHAWALPUR,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
4 BHAKKAR	0	0	0	0	0	0	6	0	0	0	0	0	0.01
5 CHAKWAL	0	0	6.8	0	2.2	0	0.01	0	0	0	0	0	0
6 D.G.KHAN	0	0	0	0	0	0	0.01	14	0	0	0	0	0
7 FAISALABAD	0	0	0	0	16	0	8	0	0	0	0	0	0
8 ISLAMABAD,AIRPORT	0	0	0.01	0	0.01	0.01	0.01	0	0	0.01	34	53	6
9 ISLAMABAD,ZEROPOINT	0	0	0.01	0	5	0	0	0	0	0.01	38	48	3
14 JHANG	0	0	0	0	0	0	2	0	0	0	0	0	0
15 JOHARABAD	0	0	0	0	0	0	4.4	0	0	0	0	0	0
16 JHELMUM	0	0	0.6	0	0	0	0.2	0	0	0	1.4	58.2	0.01
17 KASUR	0	0	0	0	0	0	18	0	0	0	0	0.01	0
18 KHANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0
19 KOT ADDU	0	0	0	0	0	0	69	0	0	0	0	0	0
20 KAMRA	0	0	0	0	18	0	0	0	0	0	10	22	1
21 LAHORE, AIRPORT	0	0	2	0	1	0	66.2	0	0	0	5	8.4	0
22 LAHORE,CITY	0	0	1	0	0	0	23	0	0	0	0.01	21.6	0
37 LAYYAH	0	0	0	0	0	0	0.01	0	0	0	0	0	0
38 MANDIBAHAUDDIN	0	0	0.01	0	14	0	2.5	0	0	0	0	8	0
39 MIANWALI	0	0	0	0	13.5	0	0	0	0	0	0	47	0.01
40 MULTAN	0	0	0	0	0	0	2.2	0	0	0	0	0	1.3
41 MANGLA	0	0	4	0	0.8	0	0	0	0	3	1.8	33	1.6
42 MURREE	0	0.01	0	3	3	0	0.01	0	0	1	50	42	0
43 NOORPUR THAL	0	0	0	0	0	4	1	0	0	0	0	0	0
44 OKARA	0	0	0	0	0	0	0	0	0	0	0	0	0
45 RAHIM YAR KHAN	0	0	0	0	0	0	6.8	0	0	0	0	0	0
46 GUJRANWALA	0	0	16	0	46	14	6.4	0	0	0	0	107	0
47 GUJRAT	0	0	1	6	8.2	0	0.01	0	0	0.6	0	138	0
48 SAHIWAL	0	0	0	0	0	0	3	0	0	0	0	0	0
49 SARGODHA A/P	0	0	0	0	18	0	39	0	0	0	0	0	0
50 SHORKOT	0	0	0	0	0	0	2	0	0	0	0	0	0
51 SIALKOT CANTT	0	0	0	4	2	0	1	0	8.4	44.5	1.4	30	0
52 SIALKOT AIRPORT	0	0	9.8	0.4	14.2	0	1	0	1.6	12.8	0.8	113	0
53 T.T. SINGH	0	0	0	0	0	0	0.6	0	0	0	0	0	0

■ Indicates daily highest rainfall

■ No rain through out the region

RAINFALL (MM) STATEMENT FOR THE MONTH OF JULY - 2017

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29.00
0	0	0	0	0	16	0.01	0	0	0	0	0	0	0	0	7	0	0	25.61
0	0	0	0	0	14	0.01	0	0	0	0	0	0	0	0	0.01	0	0	16.32
0	0	0	0	0	8	0	0	0	0	0	0	0	0.01	0	0	0	0	16.01
0	9.2	0	3.2	18.4	0	0	30.6	4.4	4.4	1.6	18.5	0	11.6	8.2	36.2	39.8	0	204.51
0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	34.03
0	0	0	0	0	0	0	1	0	11	0	0	0	0	1	8	0	1	92.00
0	0	0	5	2	0	0	14	0.01	1	0.01	0.01	2	2	2	0	0.01	42	227.09
0	0	0.01	18.5	3	0.01	0	14	0	9	0.01	1	0.01	0.01	0.01	0	0.01	45	284.59
0	0	0	0	0	2	0	22.4	0	0	0	0	0	0	0	97	0	0	127.60
0	1	0	5	0.01	1	0	0.01	0	0	0	0.01	0	12.7	2.4	16	4	0	47.53
1.8	0	0	30.6	30.6	26.2	0	0.01	0	0	0	1.8	2.2	5	38.6	25	6.4	0.01	259.32
0	0	0	0	21	0	0	0	0	0	0	0	0	0	0.01	0	0	0	39.04
0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	0.01	0.01	0	46.02
0	0	0	0	0	12.2	0	0	0	1.4	0	0	0	1	0	0	0	0	90.60
0	0.01	0	0.01	21	0	0	56	0.01	79	0	48	34	23	2	0.01	0.01	10	332.05
0	8	0	0	10	45	0	0.01	0	0	0	0	0	0	0	0.01	0	2	152.62
0.01	46.6	0	0	1.4	0.4	0	0.01	0	0	0	0	0	0	18	25.2	0	4.7	149.13
0	0	0	0	1.6	0.01	0	0	0	0	0	0	0	0	0	0	0	0	1.62
0.01	0	0	35.4	24	4	0	0	0	0	0	0	0.5	0.01	0	5	0	1	177.83
0	14	0	8	0	5	0	0	0	0.01	0.01	0	1	7	0	20	0.01	0	116.03
0	0	0	0	0	6.6	0	0	0	0	0	0	0	0	0	9	0	0.01	29.81
0.5	0	0	22	71	17	0	0	0.3	0.01	0	36.7	1.2	5.1	31.8	0	0.01	0.01	252.23
5	1.2	0	1.9	6	0.5	0	6	9	17	3	0	0	3	0	3	8	1	209.62
0	0	0	0	0	0	0	0	0	0	0	0	0	68	0	0	5	0	78.00
3	0	0	0	0.6	0	0	2.8	0.01	0.2	0	0	0	0	0	0	0	0	29.61
0	0	0	0	0	7.6	0	0	0	0	0	0	0	0	0	1.2	0	0	15.60
0	0	2	0.01	0.4	1	0	0.01	0	1.4	1	0	16	0	0	0	3	0	275.22
0	0	0	39.4	15.8	4.2	0	0	0	0	0	21	1.5	18	3.5	0	0	38	331.11
0	0	0	0	1	40	0	9	0	0	0	0	0	0	0	2	0	0	55.01
0	0	0	0	0	3	0	0	0	0	0	0.01	0	11	0.3	3	4	11	89.32
0	0.01	0	0	0	13	0	15	0	0	0	0	0	0	0	2	0	0.01	32.02
0	0	23.3	0.6	0.2	80	0	0	43.5	26.5	0.01	8	14	0	0.6	45.5	0.01	46	396.82
0	0	2	10.8	0.4	18.2	0	0	0	0	0.8	0.01	0.01	0	0.01	0.4	0.01	31.8	265.84
0	0	0	0	0	37.2	0	0.2	0	0	0	0	0	0	0	35	0	0	77.20

RAINFALL (MM) STATEMENT FOR THE MONTH OF AUGUST - 2017

Punjab-Stations	1	2	3	4	5	6	7	8	9	10	11	12	13
1 BAHAWALNAGAR	0.01	0	0	0	0	0	0	0	0	0	0	0	0
2 BAHAWALPUR,CITY	0	0	0	0	0	0	0	0	0	0	0	0	0
3 BAHAWALPUR,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
4 BHAKKAR	0	0	0	0	0	0	0	0	0	0	0	0	0
5 CHAKWAL	0.01	64.8	0	2.6	0	0	0	0	0	0	0	0	0
6 D.G.KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0
7 FAISALABAD	0.6	4	0	0	0	0	0	0	0	0	0	0	0
8 ISLAMABAD,AIRPORT	0.01	24	10	3	0.01	0.01	0	0	0	20	8	0	0
9 ISLAMABAD,ZEROPOINT	0.01	24	7	3.8	4	0	0	0	2	27	21	0	0
14 JHANG	0	0	0	0	0	0	0	0	0	0	0	0	0
15 JOHARABAD	2.6	8.2	0	0	0	0	0	0	0	0	0	1	0
16 JHELMUM	12	155	6.3	0	0	0	0	0	0	0	0.6	0.01	0
17 KASUR	0	0	0	0.8	0	0	2	34	0	0	0	0	0
18 KHANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0
19 KOT ADDU	0	0	0	0	0	0	0	0	0	0	0	0	0
20 KAMRA	35	7	32	39	0.01	0	0	0	0	21	0.01	0	0
21 LAHORE, AIRPORT	0.01	5	0	0	0	0.01	29	0	0.01	0	0	0	0
22 LAHORE,CITY	0.01	0.01	0.01	0	0	3	12	0	0.2	0	0	0	0
37 LAYYAH	0	0	0	0	0	0	0	0	0	0	0	0.5	0
38 MANDIBAHAUDDIN	1.6	3.8	0	0	0	0	0	0	0	0	10	0	0
39 MIANWALI	42	0.01	0.01	0	0	0	0	0	0	0	0	0.01	0
40 MULTAN	0	0	0	0	0	0	0	0	0	0	0	0	0
41 MANGLA	53	53	24.8	0	0	0	0	0	0	3	1.6	0.01	0
42 MURREE	22	5	17	0.01	0	0.01	3	0	28	57	19	5	0
43 NOORPUR THAL	0	0	0	0	0	0	0	0	0	0	0	21	0
44 OKARA	7	0.3	0	0	0	0	0	0	0	0	0	0	0
45 RAHIM YAR KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0
46 GUJRANWALA	14	64	0.8	1.8	0	0	6	0	0	0	0	0	0
47 GUJRAT	21	57.5	0	0	12	0	0	0	0	10.2	0.01	0	15.2
48 SAHIWAL	8	0	0	0	0	0	0	0	0	0	0	0	0
49 SARGODHA A/P	0	0.01	0	0.01	0	0	0	0	0	0	0	0.01	0
50 SHORKOT	0	0	0	0	0	0	0	0	0	0	0	0	0
51 SIALKOT CANTT	18	0	51.1	0.9	1	0	0	0	20	39	43.4	0	1
52 SIALKOT AIRPORT	39	55.2	39	6.2	9.2	0	0	0	9	3.8	0.6	0	0.4
53 T.T. SINGH	0	66.2	0	0	0	0	0	0	0	0	0	0	0

■ Indicates daily highest rainfall

■ No rain through out the region

RAINFALL (MM) STATEMENT FOR THE MONTH OF AUGUST - 2017

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	25	25.02
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.03
0	0	0	0	0	0	0	0	0	0	0	0	0	2.7	0	0	0.01	0	2.71
2	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	2.01
37.8	0	0	0	0	0	1	0	0	12.5	0	16.2	4.4	0	0	0	0	0	139.31
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0.01	32	71.01
25	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	1	37.60
10	0	0	0	0	0	1	0	4	0.01	72	70	0	0	0	16	0	0	238.04
7	0	0	0	0	0	3	0	1	0.01	22	39	0	0	0	0.01	0.01	0	160.84
29.6	0	0	0	0	0	0	0	0	0.01	0	0	6.8	0	0	0	44.2	69.8	150.41
28.4	0	0	0	0	0	0.01	0	0	14	0	0.01	29	0	0	0	0.01	8.3	91.53
19.4	0	0	0	0	0	35	0	0	5.2	28.6	33.6	4	0	0	0	0.6	11.6	311.51
0	0.01	0	0	0	0	0	0	0	0	0	15	1	0.01	0	0	11	2	65.82
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2.4	5.40
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6.00
4	0	0	0	0	0	16	0.01	39	1	3	12	0	0	0	0	0	2	211.03
9	0	0	0	0	0	0	0.01	0	0	0	0.01	12	7	0	0	20	20	102.05
6.2	0	0	0	0.01	0	0	0	0	0	0	5.2	19.4	3.7	0	0	11	9.6	70.34
42	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	60.50
53.6	0	0	0	0	0	21	0	0	0.01	0	73	7.5	0.01	0	0	2.2	5	177.72
116	0	0	0	0	0	0	0	0	6	0	6	2	0	0	21	0	0	193.03
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	26.2	30	56.22
35	0	0	0	0	0	22	0	0	2	45	35	14	0.01	0	0.01	0	9.3	297.73
5.6	0	0	0	0	0	24	0	0.01	0	0.01	27	0	0	0	46.0	0	3.4	262.04
45	0	0	0	0	0	0	0	0	0	0	0	20	0	0	11	0	1	98.00
1.8	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.1	9.22
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.00
37	0.2	0	0	0	0	0	0	0	0	0.01	12.8	17.2	5	0	0	5.4	4	167.81
25	0	0	0	0	0	0	0	0	0	15	22	33	0	0	0	2.6	1	214.01
0.01	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2	2	17.01
27	0	0	0	0	0	0	0	0	0	0	0	27	0.01	0	16	6	18	94.04
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9	54.00
26	0	0	0	0	0	0.01	0	0	0	0.01	5.6	10.2	0.4	0	2	1	0.4	220.02
16.8	0	0	0	0	0	1	0.01	0	0	22.2	78.4	20.4	0.01	0	4.8	7.2	0.4	313.62
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	13.8	3.8	117.81

RAINFALL (MM) STATEMENT FOR THE MONTH OF SEPTEMBER - 2017

Punjab-Stations	1	2	3	4	5	6	7	8	9	10	11	12	13
1 BAHAWALNAGAR	5	0	0	0	39.0	0	0	3	0	0	0	0	0
2 BAHAWALPUR,CITY	8	0.01	0	0	0	0	0	0	0	0	0	0	0
3 BAHAWALPUR,AIRPORT	25	0	0	0	0	0	0	0	0	0	0	0	0
4 BHAKKAR	0	0	0	0	0	1	0	0	0	0	0	0	0
5 CHAKWAL	0	5.4	0	36	0	0	4.2	0	0	0	10.6	0	0
6 D.G.KHAN	7	1	0	0	0	0	3	0	0	0	0.01	0.01	0
7 FAISALABAD	3.6	0	9	21	0	0	13	0	0	0	0	0	0
8 ISLAMABAD,AIRPORT	3	13	0	1	3	0	0	0.01	0	0	14	0	0
9 ISLAMABAD,ZEROPOINT	0	49.0	0	0	0	0	0	0	0	0	43.0	0	0
14 JHANG	3.4	0	32.8	0	0	0	0	0	0	0	0	0	0
15 JOHARABAD	0	5.6	0	29.2	0	4.4	2	0	0	0	0.8	0	0
16 JHELMUM	52	6	2	0	4	0	0	0	0	0	3.1	0	0
17 KASUR	0.01	0	0	0.01	0.01	0	0.01	0	0	0	3	2	0
18 KHANPUR	45.6	0	0	0	0	0	0	0	0	0	0	0	0
19 KOT ADDU	27.4	0	0	0	0	0	0	0	0	0	0.01	0	0
20 KAMRA	0	30	19	3	0	1	0	0	0	0	5	0	0
21 LAHORE, AIRPORT	0.01	9.8	0.01	0.01	1	0	30.5	0	0	0	0.01	0	0
22 LAHORE,CITY	0.0	19.0	0	0	0	0	24.2	0	0	0	0.01	0	0
37 LAYYAH	4	0	0	0	0	0.3	0	0	0	0	0	0	0
38 MANDIBAHAUDDIN	0.01	6	0	10	0.01	0	0.01	0	0	0	9	0	0
39 MIANWALI	0	0	0	61.0	0	0	0	0	0	0	3	0	0
40 MULTAN	12.2	0	0	0	0	0	0	0	0	0	0	0	0
41 MANGLA	21	25	0	0	23	0	0	0	0	0	7.3	0	0
42 MURREE	16	10	4	0	0	0.01	5	6	0.01	0	12	0	0
43 NOORPUR THAL	5	2	12	7	0	0	0	0	0	0	0	0	0
44 OKARA	16	0	7	0	1	0	1.8	0	0	0	0.01	0	0
45 RAHIM YAR KHAN	27	0	0	0	0	0	0	0	0	0	0	0	0
46 GUJRANWALA	30	10	0	0	1	0	7.8	0	0	0	1	0	0
47 GUJRAT	12.6	0	0	0	0	0	0	0	0	0	5.6	0	0
48 SAHIWAL	43	0	0	0	1	0	0	0	0	0	0	0	0
49 SARGODHA A/P	4	12	2	27	0	0	9	0	0	0	0.01	0	0
50 SHORKOT	6	0	0	0.01	0	0	0	0	0	0	0	0	0
51 SIALKOT CANTT	4.4	0.01	32	0	5	0	0.01	0	0	0.4	0	0	0
52 SIALKOT AIRPORT	11.2	4.8	0	0	9.2	0	0.2	0	0	0	0.4	0	0
53 T.T. SINGH	8.1	0	0	0.4	1	0	24	0	0	0	0	0	0

■ Indicates daily highest rainfall

■ No rain through out the region

RAINFALL (MM) STATEMENT FOR THE MONTH OF SEPTEMBER - 2017

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47.00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.00
1	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.01
2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.02
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49.60
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92.00
1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.60
29.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71.00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67.10
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.04
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45.6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.41
0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58.01
0.01	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	41.36
0.2	0	0	0	0	0	0.01	0	8.8	0	0	0	0	0	0	0	0	52.23
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.30
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.04
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73.0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.20
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76.30
0	0	0	0	0	0	0	0	0	0	0	2	1.4	0	0	0	0	56.42
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.81
0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.02
2	0	0	0	0	0	0	0	0	0	0	0	0	4.5	0	0	0	56.30
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.20
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44.00
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76.0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.01
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41.82
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.81
0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33.51

RAINFALL (MM) STATEMENT FOR THE MONTH OF OCTOBER - 2017

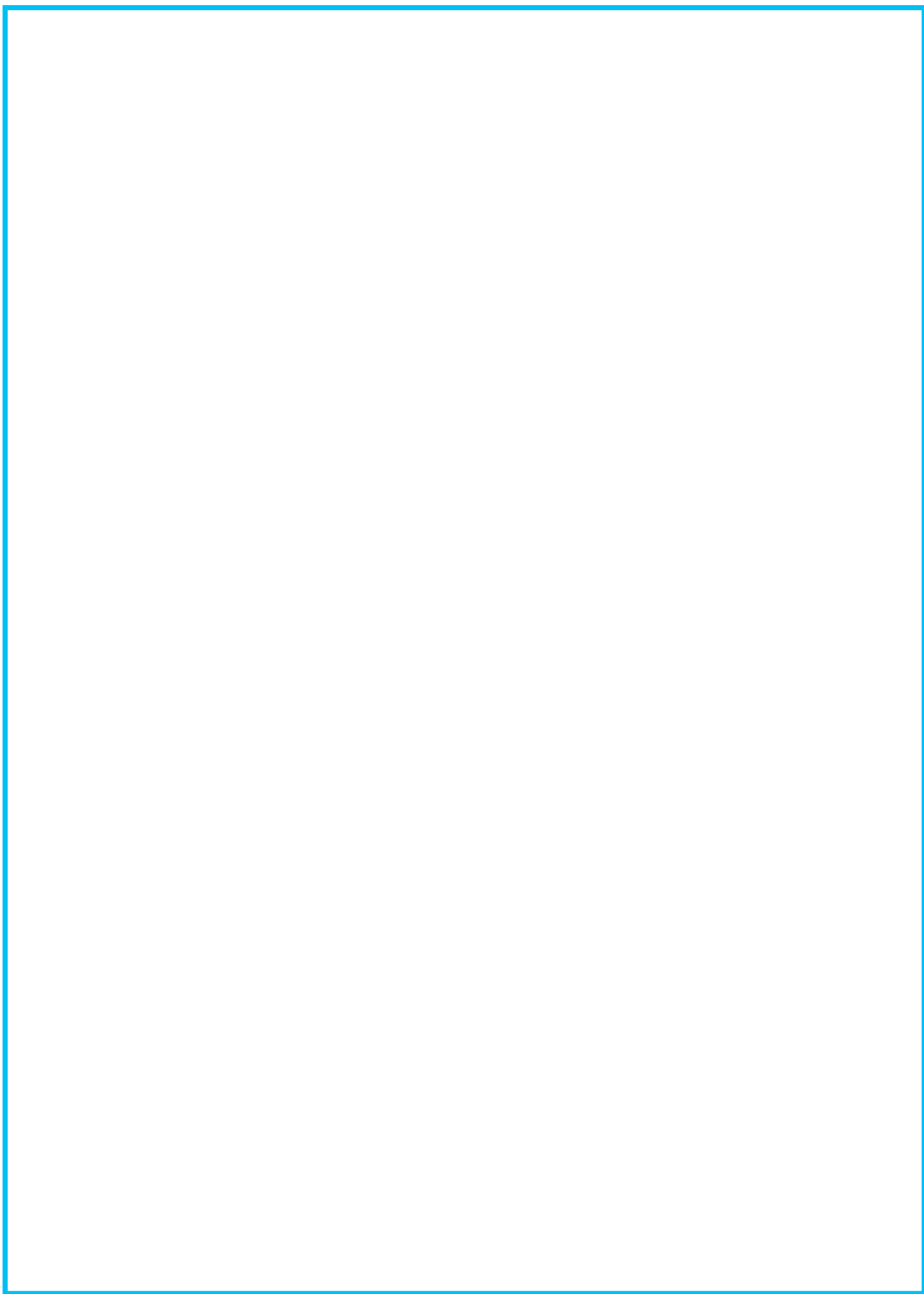
Punjab-Stations	1	2	3	4	5	6	7	8	9	10	11	12	13
1 BAHAWALNAGAR	0	0	0	0	0	0	0	0	0	0	0	0	0
2 BAHAWALPUR,CITY	0	0	0	0	0	0	0	0	0	0	0	0	0
3 BAHAWALPUR,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
4 BHAKKAR	0	0	0	0	0	0	0	0	0	0	0	0	0
5 CHAKWAL	0	0	0	0	0	0	0	0	0	0	0	0	0
6 D.G.KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0
7 FAISALABAD	0	0	0	0	0	0	0	0	0	0	0	0	0
8 ISLAMABAD,AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
9 ISLAMABAD,ZEROPOINT	0	0	0	0	0	0	0	0	0	0	0	0	0
14 JHANG	0	0	0	0	0	0	0	0	0	0	0	0	0
15 JOHARABAD	0	0	0	0	0	0	0	0	0	0	0	0	0
16 JHELUM	0	0	0	0	0	0	0	0	0	0	0	0	0
17 KASUR	0	0	0	0	0	0	0	0	0	0	0	0	0
18 KHANPUR	0	0	0	0	0	0	0	0	0	0	0	0	0
19 KOT ADDU	0	0	0	0	0	0	0	0	0	0	0	0	0
20 KAMRA	0	0	0	0	0	0	0	0	0	0	0	0	0
21 LAHORE, AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
22 LAHORE,CITY	0	0	0	0	0	0	0	0	0	0	0	0	0
37 LAYYAH	0	0	0	0	0	0	0	0	0	0	0	0	0
38 MANDIBAHAUDDIN	0	0	0	0	0	0	0	0	0	0	0	0	0
39 MIANWALI	0	0	0	0	0	0	0	0	0	0	0	0	0
40 MULTAN	0	0	0	0	0	0	0	0	0	0	0	0	0
41 MANGLA	0	0	0	0	0	0	0	0	0	0	0	0	0
42 MURREE	0	0	0	0	0	0	0	0	0	0	0	0	0
43 NOORPUR THAL	0	0	0	0	0	0	0	0	0	0	0	0	0
44 OKARA	0	0	0	0	0	0	0	0	0	0	0	0	0
45 RAHIM YAR KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0
46 GUJRANWALA	0	0	0	0	0	0	0	0	0	0	0	0	0
47 GUJRAT	0	0	0	0	0	0	0	0	0	0	0	0	0
48 SAHIWAL	0	0	0	0	0	0	0	0	0	0	0	0	0
49 SARGODHA A/P	0	0	0	0	0	0	0	0	0	0	0	0	0
50 SHORKOT	0	0	0	0	0	0	0	0	0	0	0	0	0
51 SIALKOT CANTT	0	0	0	0	0	0	0	0	0	0	0	0	0
52 SIALKOT AIRPORT	0	0	0	0	0	0	0	0	0	0	0	0	0
53 T.T. SINGH	0	0	0	0	0	0	0	0	0	0	0	0	0

■ Indicates daily highest rainfall

■ No rain through out the region

RAINFALL (MM) STATEMENT FOR THE MONTH OF OCTOBER - 2017

[illegible]



ANNEXURE 10

FLOOD FIGHTING EQUIPMENT

FLOOD FIGHTING EQUIPMENT

Sr. No.	Name of Districts	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Life Jackets	Life Rings	Life Lines	Boats	OBM Engine	First Aid Kits	Rescue Bag	Safety Harnesses	Ambulances	Basket or Floating Stretchers	Fire Brigade	De-Watering Sets	Sucker Machine	Jitter Machine	Water Tanks / Bowzers	Tractors / Trolleys	Dumpers	Excavator	Cranes	Bulldozers / Loaders
1	Lahore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Kasur	275	-	-	7	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Sheikhupura	180	78	-	16	19	-	-	-	17	-	3	85	-	-	-	36	1	-	-	-
4	Nankana Sahib	168	129	3	12	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	623	207	3	35	45	0	0	0	17	0	3	85	0	0	0	36	1	0	0	0
5	Bahawalpur	150	50	-	14	15	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-
6	Bahawalnagar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Rahim Yar Khan	360	57	34	34	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	Total	510	107	34	48	15	0	-	-	-	-	-	27	-	-	-	-	-	-	-	-
8	D.G Khan	460	84	-	32	32	-	-	-	-	-	-	35	-	-	-	-	-	-	-	-
9	Layyah	694	66	-	-	-	-	-	-	22	-	5	15	-	-	11	40	-	-	-	15
10	Muzaffargarh	732	50	-	39	39	-	-	-	-	-	3	58	5	5	8	41	-	-	-	-
11	Rajanpur	281	125	-	32	30	-	-	-	-	-	-	65	-	-	-	-	-	-	-	-
	Total	2167	325	0	103	101	0	0	0	22	0	8	173	5	5	19	81	0	0	0	15
12	Faisalabad	166	35	-	12	8	-	-	-	18	-	-	95	-	-	-	3	7	-	-	-
13	Chiniot	449	106	-	23	23	-	-	-	14	-	-	20	-	-	-	-	-	-	-	-
14	Jhang	1173	217	-	50	50	-	-	-	11	-	-	40	-	-	-	21	-	-	-	-
15	Toba Tek Singh	100	7	-	10	10	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
	Total	1888	365	0	95	91	0	0	0	43	0	0	159	0	0	0	24	7	0	0	0

FLOOD FIGHTING EQUIPMENT

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	D i v i s i o n s		
Jeeps	Pickups	Mini Trucks	Axes/Shovels/Picks	Dry Suits	Electrical Power Generators	Extension Ladder	Foggin Machines	Hydraulic Cutter	Jumping Sheet	Megaphones	Rescue Tripod	Rope Ladders	Ropes	Rubber Gloves (11000 Watt)	SCBA Cylinders	Search Lights	Tent	Blankets	Torches / Lamps	Dredgers	Sand Bags	Mosquito Net	Plastic Mats			
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		L a h o r e	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	170	-	-	-	-	-	-			100
-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	196	-	-	-	-	-	-			112
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	14		
0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	10	377	0	0	0	0	0	0	226	B a h a w a l p u r	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	-	-	-	-	-	-	-		
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	55	3900	-	-	-	-	-	1700	500		
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	65	3902	-	-	-	-	-	1700	500		
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	4	15	-	-	-	-	-	-	4	D G K h a n	
53	45	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1413	-	-	-	-	500	713			
-	-	-	-	-	1	-	39	-	-	-	-	-	-	-	-	90	131	-	-	-	-	335	910			
-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	19	2726	-	-	-	-	1000	1870			
53	45	7	0	0	4	0	39	0	0	0	0	0	0	0	0	113	4285	0	0	0	0	1835	3497			
-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-	57	140	-	-	-	-	0	120	F a i s a l a b a d		
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	14	500	-	-	-	-	1000	1000			
-	-	-	-	-	1	-	19	-	-	-	-	-	-	-	-	135	4642	120	-	-	-	3000	3000			
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	710	-	-	-	-	200	400			
0	0	0	0	0	30	0	19	0	0	0	0	0	0	0	0	207	5992	120	0	0	0	4200	4520			

FLOOD FIGHTING EQUIPMENT

Sr. No.	Name of Districts	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Life Jackets	Life Rings	Life Lines	Boats	OBM Engine	First Aid Kits	Rescue Bag	Safety Harnesses	Ambulances	Basket or Floating Stretchers	Fire Brigade	De-Watering Sets	Sucker Machine	Jitter Machine	Water Tanks / Bowzers	Tractors / Trolleys	Dumpers	Excavator	Cranes	Bulldozers / Loaders
16	Gujranwala	430	190	6	36	37	38	2		27	-	-	-	-	-	-	-	-	-	-	-
17	Gujrat	261	125	-	14	14	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-
18	Hafizabad	499	144	-	39	39	-	-	-	27	-	3	37	-	-	3	16	-	-	-	-
19	Mandi Bahauddin	360	104	4	19	18	10	-	-	17	-	9	19	1	-	7	15	-	-	-	1
20	Narowal	288	124	-	24	13	-	-	-	-	-	-	27	-	-	-	-	-	-	-	-
21	Sialkot	456	376	5	36	36	42	-	-	17	-	10	122	6	2	5	20		2	-	-
	Total	2294	1063	15	168	157	90	2	0	88	0	22	231	7	2	15	51	0	2	0	1
22	Multan	547	210		31	31	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-
23	Khanewal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	Lodhran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Vehari	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	547	210	0	31	31	0	0	0	0	0	0	78	0	0	0	0	0	0	0	0
26	Rawalpindi	195	43	19	19	-	-	-	-	28	-	-	22	-	-	-	3	-	-	-	-
27	Attock	108	20		9	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Chakwal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	Jhelum	240	27		23	23	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
	Total	543	90	19	51	32	0	0	0	28	0	0	26	0	0	0	3	0	0	0	0
30	Sahiwal	80	140	-	10	11	-	-	-	-	-	-	42	-	-	-	-	-	-	-	-
31	Okara	162	122	13	13	-	10	10	20	25	-	10	-	-	-	14		1	-	-	-
32	Pakpattan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	242	262	13	23	11	10	10	20	25	0	10	42	0	0	14	0	1	0	0	0
33	Sargodha	262	172	-	16	16	-	-	-	20	-	8	35	-	-	8	19	-	-	-	-
34	Bhakkar	296	128	-	21	19	-	-	-	-	-	-	12	4	2	5	22	-	-	-	-
35	Khushab	260	52	-	31	27	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-
36	Mianwali	300	145	-	18	18	-	-	-	21	-	3	29	-	-	-	13	-	-	-	-
	Total	1118	497	0	86	80	0	0	0	41	0	11	91	4	2	14	54	0	0	1	20
GRAND TOTAL		9932	3126	84	640	563	100	12	20	264	0	54	912	16	9	62	249	9	2	1	36

FLOOD FIGHTING EQUIPMENT

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	D i v i s i o n s
Jeeps	Pickups	Mini Trucks	Axes/Shovels/Picks	Dry Suits	Electrical Power Generators	Extension Ladder	Foggin Machines	Hydraulic Cutter	Jumping Sheet	Megaphones	Rescue Tripod	Rope Ladders	Ropes	Rubber Gloves (11000 Watt)	SCBA Cylinders	Search Lights	Tent	Blankets	Torches / Lamps	Dredgers	Sand Bags	Mosquito Net	Plastic Mats	
1	-	-	-	7		2	-	-	2	-	-	-	-	-	-	15	118	-	-	-	-	18	18	G
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2	0	0	0	7	11	2	0	2	2	0	0	0	0	0	6	280	4180	480	25	0	0	2560	3038	w
-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1696	-	-	-	-	-	670	975	a
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5	0	0	43	3	7	2	0	3	0	0	0	-	-	-	15	57	2782	-	-	-	-	1070	1332	g
60	57	7	43	10	71	7	58	5	8	0	0	0	10	0	21	775	24988	600	25	0	0	13165	15358	o
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