

PROVINCIAL MONSOON CONTINGENCY PLAN 2016

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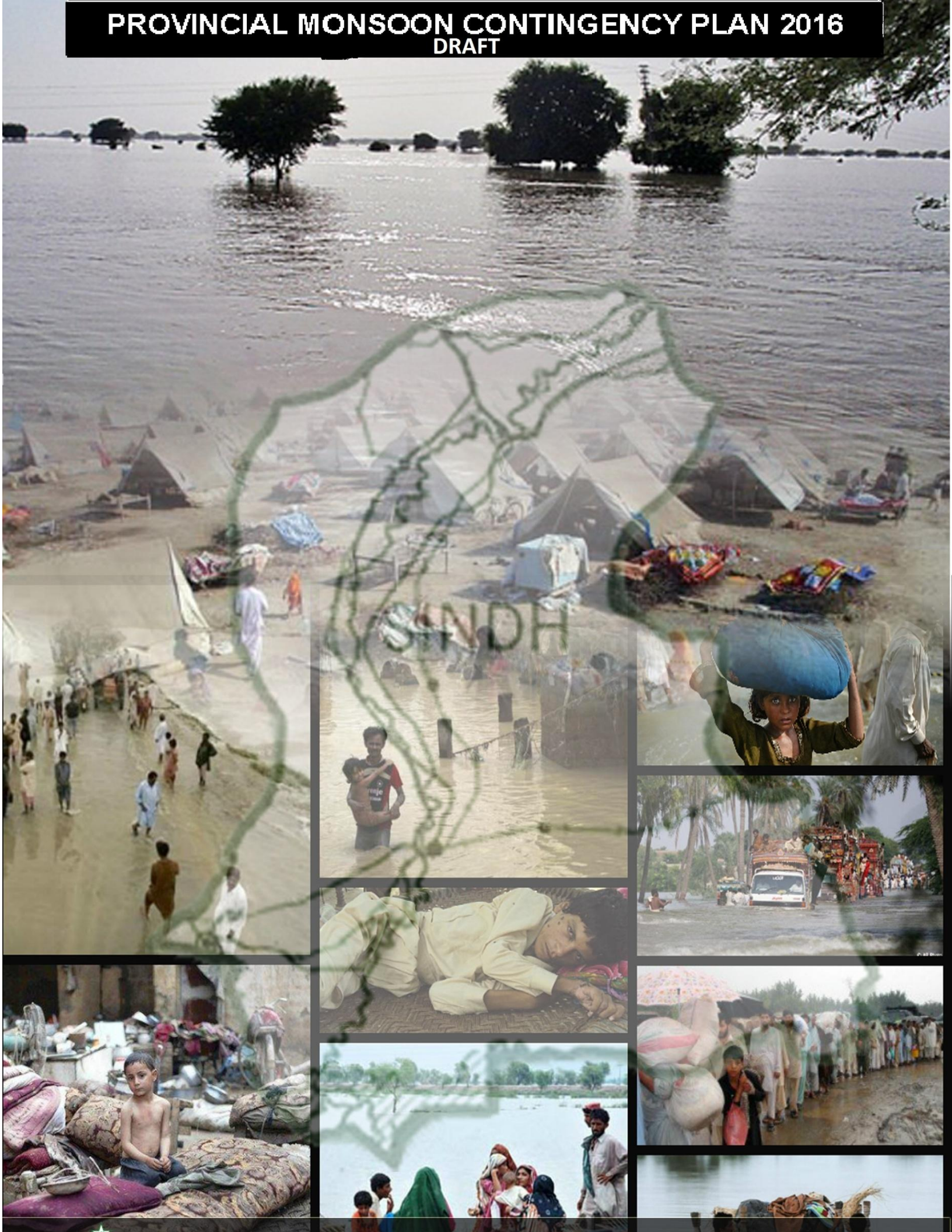


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LIST OF ACRONYMES

DDMA	District Disaster Management Authority
DRR	Disaster Risk Reduction
DEOC	District Emergency Operation Center
DMA	Disaster Management Authority
ERC	Emergency Relief Cell
FDP	Flood Displaced Person
FFC	Federal Flood Commission
FFD	Flood Forecasting Division
FFT	Flood Forecasting Telemetry System.
GHQ	Army General Headquarters
HH	Households
INGO	International Non-Governmental Organization
LBOD	Left Bank Outfall Drain
MIRA	Multi Cluster Initial Rapid Assessment
NDMA	National Disaster Management Authority
NGO	Non-Governmental Organization
NHA	National Highways Authority
NHEPRN	National Health Emergency Preparedness and Response Network
OCHA	UN Office for the Coordination of Humanitarian Affairs
O&M	Operations and Maintenance
PDMA	Provincial Disaster Management Authority
PEOC	Provincial Emergency Operations Center
PMD	Pakistan Meteorological Department
PRCS	Pakistan Red Crescent Society
RBOD	Right Bank Outfall Drain
SASCOF	South Asian Climate Outlook Forum
SITREP	Situation Report
SUPARCO	Space and Upper Atmosphere Research Commission
SOPs	Standard Operating Procedures
UN	United Nations
UNICEF	UN Children's Fund
USAR	Urban Search and Rescue Team
Wash	Water, Sanitation and Hygiene
WHO	World Health Organization
WMO	World Meteorological Organization

EXECUTIVE SUMMARY

The nature and intensity of natural disasters has changed considerably over the period of time. Disaster risk reduction and management, attempts to address risks associated with potential hazards is an integral part of development. Consequently, it is less events and more process oriented. It is based on a continuous assessment of vulnerabilities, risks and involves the role of multiple actors and stakeholders. Given the complexity, contingency planning is required to define what preparedness mechanisms will be used, when and where. Before a response is required, contingency planning affords agencies, both government and humanitarian the opportunity to define when, where and why their emergency response resources will be deployed, when emergency funds will be used and what kind of responses, materials and types of personnel they will need.

The lessons learnt from unprecedented floods of 2010 followed by heavy monsoon rainfalls of 2011 and flash flooding in 2012 and subsequent disasters call for quick and effective actions to control the situation and above all, to save lives. However, effective action depends on the existence of practical and well tested contingency plans. The Provincial Contingency Plan has been formulated to translate recommendations from district administrations, line departments and other stakeholders into action. However, the devastation caused due to floods/ rainfalls witnessed since last six years has necessitated for taking on board all agencies for an integrated contingency planning, involving government departments, districts administrations, armed forces and humanitarian assistance organizations, thereby ensuring synergized and optimal utilization of resources by agencies in the field while complementing each other with appropriate linkages and better coordination to support actions along lines of command.

PDMA continues to emphasize upon the Contingency Planning process as a preparedness measure for response to natural hazards particularly Monsoon Contingency. Following catastrophic floods since 2010, this plan

focuses on planning for the upcoming Monsoon - 2016 hazards to identify and analyze related risks for not just their humanitarian impacts but also the associated adverse affects on private and public infrastructure, and to define roles and responsibilities of diverse stakeholders for preparedness and response.

It is worth mentioning here that PDMA carried out joint sessions for 2016 Monsoon contingency planning with district administrations, line departments, armed forces and other stakeholders primarily for anticipating likely scenarios and perceiving threat levels. While further drawing conclusions from the inputs through the technical experts and relevant departments, it mainly involves identifying gaps and challenges to effective emergency response and then planning and implementing a series of actions to increase response capacity and reduce potential gaps. Unlike former simple or generic plans scenarios were used as a basis for developing preparedness plans. The key anticipated outcomes are:

- Awareness for Building Capacities for Response,
- Depict anticipated threat perception for earmarking required resources,
- Build Integrated Planning Capacities, and
- Define required gaps ensuing Preparatory Measures.

CHAPTER 1

OVERVIEW OF THE SINDH PROVINCE

1.1 GEOGRAPHY

The Province of Sindh is located in the South- Eastern part of the Country (between Lat 23-35 degree and Lat 28- 30 N). Its gross geographical area is 140,914 Sq. km which is 18% of the Country. The geographical area is 14 million hectares out of which almost 8.0 million hectare is cultivable, and the remaining area is not available for cultivation, mostly lying in the northern hills of Khirthar Range, Eastern desert of Thar and Achharo Thar and, the Riverine area. Sindh's 60% land area is arid. Annual average precipitation is 5 inches. The River Indus flows through the middle of the province. There are seasonal streams which become active in the monsoon season; they emanate from the Khirthar hill range from West of Province, and fallout in River Indus and Arabian Sea. The province borders Arabian Sea in South, India in East, Punjab in North and Balochistan in West. Administratively Sindh Province is divided in 6 Divisions comprising of 29 Districts.

The Province took its name from River Sindh (as per the Greeks). Predominantly, it is an agricultural and pastoral economy. Lately natural resources have been identified like Oil, Gas, Coal, Granite and Cut Stone etc. These are being extracted and are contributing substantially to the national produce. Besides, the province has industries of various kind which include Textiles, Chemicals, Cement, Steel and others. Most of the industries are located in three Cities- Karachi, Kotri/ Hyderabad and Sukkur. There are two modern sea ports: Karachi Port and Bin Qasim Port, both of which are situated in Karachi and serve the entire Country including Afghanistan.

1.2 **GEOLOGY**

The Geology of Sindh is divisible in three main regions, the mountain ranges of Kirthar, Pab containing a chain of minor hills in the West and in East it is covered by the Thar Desert and part of Indian Platform where the main exposure is of Karonjhar mountains, which is famous for Nagar Parkar Granite. In the North Sindh is enquired by rocks of Laki range extending to Suleiman range and its Southern most part is encircled by the Arabian Sea. The rocks exposed in this area belong to upper Cretaceous which are recent in age. The sub-surface rocks are about 20,000 feet thick and belong to Cretaceous and Pre-Cretaceous periods.

Basin wise Sindh lies in the lower Indus Basin and its main tectonic features are the platform and fore deep areas. Thick sequences of Pab sandstone of Upper Cretaceous, Ranikot Group (Khadro, Bara, Lakhra) of Paleocene, Laki, Tiyon, and Khirthar of Eocene age, Nari Formation of Oligocene, Gaj Formation of Lower to Middle Miocene, Manchar of Upper Miocene to Pliocene, Dada Conglomerate of Pleistocene are present in various areas of Sindh. Limestone and sandstones are the most dominant sedimentary rocks in the area. Structurally Sindh generally contains gently folded anticlinal features trending in North-South direction. The major active faults in Province are as under:

SURJANI FAULT: N-S Trending: *Located West of Larkana. It cuts Quaternary deposits. The maximum magnitude of the Earthquake associated with the fault is of the order $M=6.1$ on Richter Scale.*

JHIMPIR FAULT: N-W Trending: *A number of epicenters are located on the fault. The fault has produced an earthquake of $M=5.6$ on Richter Scale.*

PAB FAULT: NN-W Trending: *Located in the Eastern part of Pab range. The maximum magnitude of the earthquake associated with fault is of the order $M=7.0$ on Richter Scale.*

RANN OF KUTCH: E-W Trending: *The fault has produced an earthquake of the order $M=7.6$ on Richter Scale. Recent studies have revealed that this fault traverses the Karachi Metropolitan Area.*

1.3 DEMOGRAPHY

The 1998 Census of Pakistan indicated a population of Sindh Province was 30.4 million, the current population is estimated to be 42.2 million using a compound growth of 2.8% since then just under half of this being urban dwellers, mainly living in Karachi, Hyderabad, Sukkur and Larkana which approximately 2.6 million people residing in katcha area. Male population is 26.315 million and Female population is 23.685 million. The literacy rate is 45.29%- Male 54.50% and Female 34.78%. Rural area 25.73% - Male 37.89% and female 12.23% whereas, urban - 63.72% - Male 69.75% & Female 56.66%. Agriculture & Fisheries workers count 34.84% out of which 65.56% is Rural Population, Elementary occupation, Service sector and Business count 43.65%.

1.4 SOCIETY

The society is cosmopolitan and the languages spoken besides Sindhi are Urdu, Punjabi, Pashto, Siraiki, Balochi, Brahui, Rajasthani, and Gujarati, while Balochis and Urdu-speaking are recent immigrants. Both Balochi, Sindhi and natives speak Sindhi language as their mother tongue.

Sindh's population is predominantly Muslim. The Province of Sindh is also home to nearly all of Pakistan's Hindus, numbering roughly 2.3 million, although most Sindhi Hindus migrated to India at the time of the partition. Smaller groups of Christians, Parsis or Zoroastrians, Ahmadis, and a few members of the Jewish community can also be found in the province.

The society in general is harmonious , but in the last couple of decades communal strife have been reported, which affects the peace of the Province in particular and the Country at large in general.

1.5 ECONOMY

As of the rest of Pakistan, the economy of Sindh is predominantly Agricultural and depends almost entirely on Irrigation. The principal source of water is the Indus River, on which three irrigation barrages have been built- Guddu Barrage in Kashmore@Kandhkot district; the Lloyd Barrage at Sukkur and the Kotri barrage at Jamshoro is the farthest in south.

Principal crops are Wheat, Rice, Cotton, Oilseeds, Sugarcane, Millets, Vegetables and Fruits. Sheep, Cattle, Camels, and Poultry are raised, and there is a healthy fishing industry as well. Manufacturing industries are concentrated in Karachi, Hyderabad, Nooriabad, Kotri and Sukkur. They produce Textile, Cement, Cardboard, Chemicals, Electric Power Supplies, Rail-Road Equipment, Machinery and other Metal products.

1.6 SHELTER

In 1998, there were 5.022 million households in Sindh, with average household size at 6.0 persons and occupancy at 3.3 persons per room. The overall housing stock comprised 52 percent katcha houses mostly without proper water supply, 48 percent pakka / semi-pakka houses mostly without planned sanitation or sewerage system. The majority of rural housing is katcha (mud), with minimal water supply and sanitation or drainage services. Almost half of the urban population is living in slums and katchi abadis, with inadequate housing and living conditions.

1.7 ADMINISTRATIVE SYSTEM

Administratively Sindh Province comprises of:

- **Division:** 06 Divisions headed by Divisional Commissioners, comprising of Karachi, Hyderabad, Mirpurkhas, Sukkur, Larkana and a newly established Shaheed Benazirabad.

- **District:** 29 Districts headed by Deputy Commissioners.

- **The Administrative / Line Departments** are headed by Administrative Secretary. Some of the most important departments are:
 - Home Department
 - Finance Department
 - Irrigation Department
 - Planning & Development Department
 - Revenue Department
 - Health Department
 - Education & Literacy Department
 - Fisheries and Livestock Department
 - Works & Services Department
 - Agriculture Department
 - Forest & Wildlife Department
 - Law Department
 - Social Welfare Department
 - Local Government Department

- **Talukas / Tehsils / Sub Divisions:** 129
- **Number of villages (settlements)** 66,923 as per census of 1998 within 5871 dehs.

CHAPTER – 2

MONSOON CONTINGENCY PLAN – GENERAL

OVERVIEW OF FLOODS

2.1 FLOODS

When rivers overflow their banks they cause damage to property and crops. Floods are common and costly Natural Disasters.

Floods usually are local, short-lived events that can happen suddenly, sometimes with little or no warning. They usually are caused by intense storms that produce more runoff than an area can store or a stream can carry within its normal channel. Rivers can also flood when dams fail, when ice jams or landslides temporarily block a channel, or when snow melts rapidly. In a broader sense, normally dry lands can be flooded by high lake levels, by high tides, or by waves driven ashore by strong winds.

Small streams are subject to floods (very rapid increases in runoff), which may last from a few minutes to a few hours. On larger streams, floods usually last from several hours to a few days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

Floods can occur at any time, but weather patterns have a strong influence on when and where floods happen. Cyclones, or Storms that bring moisture inland from the Ocean, can cause floods. Thunderstorms are relatively small but intense storms that can cause floods in smaller streams. Frontal storms form at the front of large, moist air masses moving across the Country and can cause floods. Hurricanes are intense tropical storms that can cause floods.

The size, or magnitude, of a flood is described by a term called Recurrence Interval. By studying a long period of flow records for a stream, it is possible to estimate the size of a flood that would, for example, have a 5-year

Recurrence Interval (called a 5-year flood). A 5-year flood is one that would occur, on the average, once every 5 years. Although a 100-year flood is expected to happen only once in a century, there is a 1 percent chance that a flood of that size could happen during any year.

Flood plains are lands bordering rivers and streams that normally are dry but are covered with water during floods. Floods can damage buildings or other structures placed in flood plains. They also can change the pattern of water flow and increase flooding and flood damage on adjacent property by block

The confluence of River Basins, the Canal Irrigation Network and Interrupted Drainage System and control of Head works on three major rivers, part of Indus River System, with India are some of the major reasons of flooding in Pakistan.

2.1.1 CAUSES OF FLOODS

Floods can be divided In five major categories

(I) Monsoon Floods: Flooding along rivers is natural and inevitable. Some floods occur seasonally, when monsoon rains coupled with melting snows fill river basins with too much water, too quickly. Torrential rains from decaying Hurricanes or Tropical Systems can also produce river flooding.

It has been argued that El-Nino and La Nina factors have upset the system of rains in India, Pakistan, Iran and Afghanistan. Incidentally El-Nino events are a local manifestation of a global phenomenon, which begins with the relaxation of the wind stress that drives warm water towards the West. In the case of the monsoons, which are also part of a global phenomenon, the atmospheric pressure at sea level at the South-West of the Indian Peninsula, the ocean temperature in the Bay of Bengal and the rainfall fluctuation across South Asia are inter-related critical factors. Whereas, La-Nina is a counterpart of El-Nino.

(II) Flash Floods: An arroyo is a water-carved gully or a normally dry creek found in arid or desert regions. When storms appear in these areas, the rain water cuts into the dry dusty soil creating a small fast-moving river. Flash flooding in an arroyo can occur in less than a minute, with enough power to wash away sections of pavement.

Because of its rapid nature, flash floods are difficult to forecast and give people little time to escape or to take food and other essentials with them.

(III) Floods due to Breaches: Floods due to the breaches of river embankments and canal breaches are a frequent occurrence in all the districts of Pakistan.

(IV) Urban Floods: As undeveloped land is paved for construction, it loses its ability to absorb rainfall. Rainwater cannot be absorbed into the ground and becomes runoff, filling parking lots, making roads into rivers, and flooding basements and businesses. An urban area can be flooded by an amount of rainfall that would have had no impact in a rural area. **But in crowded towns and cities, rainwater flows into storm sewers and drainage thus flooding them.**

(V) Coastal Floods - Hurricanes and Tropical storms can produce heavy rains, or drive ocean water into land. Beaches and coastal houses can be swept away by the water. Coastal flooding can also be produced by sea waves called Tsunamis, giant tidal Waves that are created by Volcanoes or Earthquakes in the ocean.

2.2 MONSOON HAZARDS IN SINDH

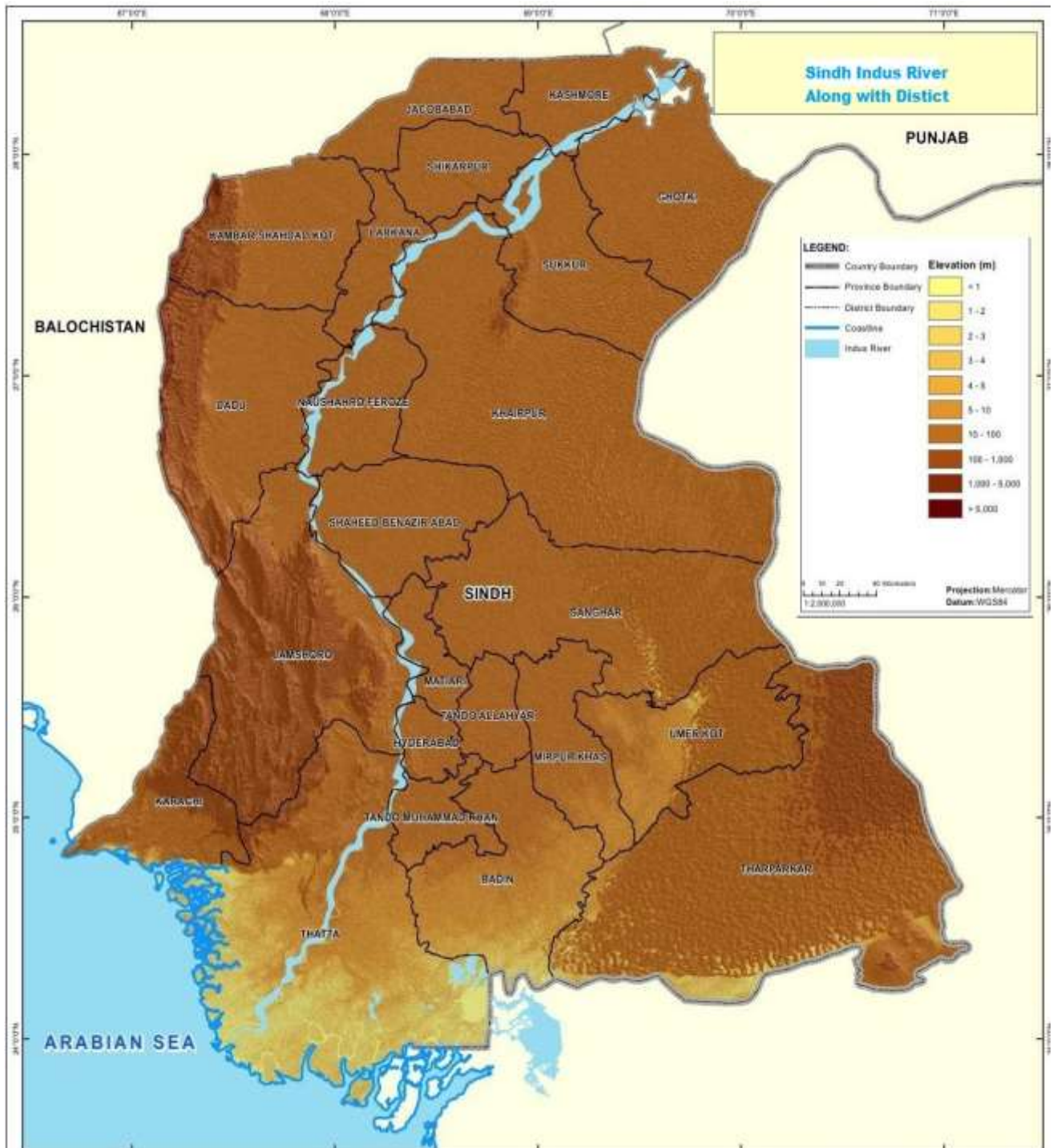
River Indus after receiving water from 5 rivers' system, causes floods in the Sindh Province. The upper regions of the Sindh Province constitute the Districts of Kashmore, Shikarpur, Jacobabad, and Larkana on the right bank of River Indus and Ghotki, Sukkur, Khairpur, Naushahro-feroze and Shaheed Benazirabad on the left bank of River Indus. These Districts on the right and left of River Indus face a severe threat owing to passage of River Indus. The districts in the lower Sindh, prone to Riverine flooding includes Dadu, Jamshoro and Thatta on the right bank of River Indus and Tando Muhammad Khan, Matiari, Hyderabad and Sujawal. The length of River Indus through the province is 750 kms.

Districts of Jacobabad, Kambar@Shahdadkot, Dadu and Jamshoro, are also vulnerable to hill torrents which cause flash flooding, the early warning possibility for which is very minimal.

Monsoon hazards in Sindh emerge as a result of heavy precipitation and subsequent high floods at Panjnad in Indus river and through flash flooding in numerous hill torrents on the Southern part of the Province. The Province is also vulnerable to precipitation generated flash flooding and urban flooding because of cloud burst, primarily in the cities of Karachi and Hyderabad. In fact historical evidence suggests that natural and manmade disasters have a significant toll in human lives in Karachi alone. Given the complexity, the simultaneous occurrence of riverine and flash floods, heavy precipitation and cloud burst phenomenon can worsen the impacts of monsoon generated disasters in the province.

2.3 MAP WITH FLOW OF RIVER INDUS ALONG DISTRICTS OF SINDH

Fig.1 Flow of River Indus



2.4 CHANGES IN THE RIVER MORPHOLOGY

The unprecedented nature of 2010 Floods caused occurrence of unregulated river flow patterns resulting in widened spans and erosions at various places. During Monsoons these trends are likely to render populations residing close-by at risk; undermining the effectiveness of the protective arrangements; and, risk severance of bridges and communication infrastructure; therefore, river training or regulating river flows to defined channels is considered essential for flood impact mitigation.

2.5 PERFORMANCE OF WATER REGULATORY INFRASTRUCTURE

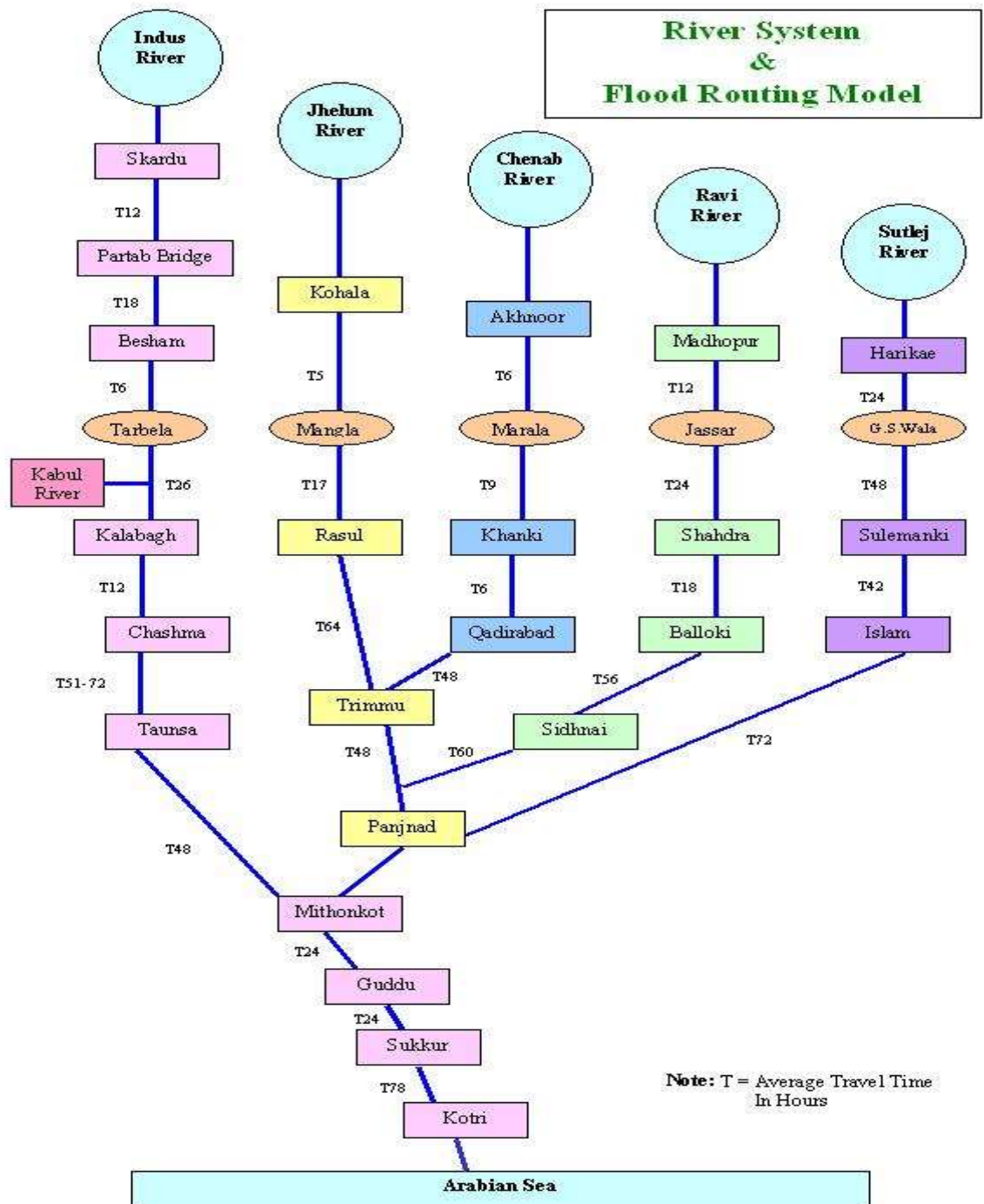
The unprecedented floods of 2010 in, addition to their colossal humanitarian impacts exposed the water regulatory infrastructure to tremendous pressures. The water which flowed surpassed the earlier records by manifolds; a detailed comparison is given in the table below. Moreover, the Schematic Model of flood routing of River system also shown below depicts that average travel time between the three hydraulic structures (Guddu, Sukkur and Kotri) is 24 hours; thus necessitating to put in place an effective and prompt decision making.

2.5.1 WATER FLOW COMPARISON

Barrage	Design Capacity (in cusecs)	Maximum Recorded (in cusecs)	Year	2010 Floods (in cusecs)	Comparison with Earlier Record (Ratio)	Comparison with Design Capacity (Ratio)
Guddu	1,200,000	1,199,000	1976	1,148,000	0.96	0.95
Sukkur	900,000	1,166,000	1976	1,130,000	1.295	1.25
Kotri	875,000	980,000	1956	964,000	0.98	1.10

Table 1: Water Flow Comparison

2.5.2 FLOOD ROUTING MODEL



Source: Flood Forecasting Division, Pakistan Meteorological Department

Fig. 2 Flood Routing Model

2.6 LATENT VULNERABILITIES

Some of underlying vulnerabilities which increase the threat of Monsoon hazards in Sindh are chalked out as under:

- 2011 monsoon rain induced floods in Southern Sindh, which does not directly fall in monsoon zone, had exposed a large segment of population, who were traditionally considered to be safe from adverse effects of monsoon, to the devastation of life and property.
- New areas of Eastern Baluchistan and Northern Sindh have been impacted by floods in 2010, 2011, 2012, 2013, 2014 and 2015 consecutively, thereby compounding their vulnerabilities.
- Population pressures have resulted in encroachments on river flood plains, thereby enhancing risks and vulnerabilities.
- Detailed flood plans' mapping covering entire Indus River System, its Tributaries, and Nallahs is yet to be done; this has been identified as a priority area in the Provincial Disaster Management Plan on the basis of which land use planning and demarcation of waterways would be done to reduce risks from flood hazard.
- Widespread Environmental Degradation had reduced the flood water absorption capacities of catchment regions and accentuated downstream vulnerabilities.
- Limited capacity in weather and flood forecasting, particularly for flash floods, necessitates preparedness to meet unpredictable challenges.
- Insufficient surface storages/ reservoirs to manage heavy river flows necessitate more extensive flood protection measures downstream.

2.7 DATA OF HISTORICAL FLOOD EVENTS

The data of losses from floods in Sindh for the past 25 years have been covered in a table attached at **Annex-A**

2.8 WEATHER OUTLOOK – MONSOON SEASON 2016

Pakistan Meteorological Department has issued “Outlook for Monsoon 2016” on 9th June, 2016 which has been reproduced as under:

Preliminary Outlook For Monsoon Season 2016

The El Niño phenomenon has weakened and La Niña is favored to develop during the summer 2016. Prevailing oceanic and atmospheric conditions are giving indications of good summer monsoon rainfall in the country. Based on statistical and dynamical downscaling of global circulation models, outlook for the season is prepared at 80% confidence level for planning purposes. The outlook for the season (July-September) 2016 is as under:

- Summer monsoon rainfall is likely to be 10-20% above normal over the country, averaged for three months.
- More than average rainfall is expected over Punjab, KP, Sindh, AJK and Northeast Balochistan.
- Some extreme rainfall events are likely to occur in the catchment areas of major rivers and other parts of the country which may cause Floods.
- There is a high probability of heavy downpour which may generate Flash Flooding along Suleman Range.
- Some heavy downpour events may produce urban flooding in big cities.
- Some strong incursions of monsoon currents, coupled with high temperature, may trigger Glacial Lake Outburst Floods (GLOF), Landslides and Flash Floods in Upper KP and GB.

South Asian Climatic Outlook Forum (SASCOF-8)

Above-normal rainfall is likely during the 2016 southwest monsoon season (June – September) over much of South Asia. Above normal rainfall is likely over broad areas of central and western parts of South Asia. Below-normal rainfall is most likely over eastern parts of the region and the southeastern part of the peninsula. Normal rainfall is likely over the remaining areas.

This consensus outlook for the 2016 southwest monsoon rainfall over South Asia has been developed through an expert assessment of the prevailing global climate conditions and forecasts from different climate models from around the world. The strong El Niño conditions that prevailed over the Pacific Since July, 2015 have now weakened to moderate level. There is strong consensus among experts that El Niño conditions will continue to weaken and reach neutral level by the middle of the southwest monsoon season. There is a possibility of La Nina conditions developing in the later part of the season, but it is recognized that there is uncertainty about its development and timing. There is also consensus that there is declining El Niño conditions will not have any adverse impacts on the southwest monsoon rainfall over the region. Other regional and global factors that can affect the region were also considered in arriving at this consensus outlook.

MONSOON 2016 FAILURE

Although SASCOF-6 findings and PMD's Monsoon Outlook have not at all indicated a dry spell for 2016, however in case there is drought like conditions in the province then PDMA Sindh may roll out its Drought Contingency Plan which would be a separate document covering roles and responsibilities of Government Agencies, Line Departments and Humanitarian Agencies for effective drought emergency, response and rehabilitation for the affected district (s).

2.10 MONSOON 2016 PREPAREDNESS CONSULTATIONS

A number of consultation sessions and coordination meetings were organized at all levels. These included meetings by PDMA with all Deputy Commissioners Division-wise, Line departments, Armed Forces, PMD, Civic Utility agencies etc to review level of preparedness, consult relevant agencies on contingency plans and resolve outstanding issues. These meetings were conducted in PDMA Headquarter which was chaired by Director General PDMA Sindh.

In order to further consolidate and coordinate Provincial preparedness for upcoming Monsoon Season, couple of high level meetings were held under the chairmanship of Chief Minister and Chief Secretary Sindh in Karachi. Chairman NDMA and all relevant Federal and Provincial agencies and stakeholders including Humanitarian Assistance Organisations were invited to share their views and valuable contributions for evolving an effective and efficient strategy towards mitigation, preparedness and response modalities.

CHAPTER – 3

DIVISIONAL MONSOON CONTINGENCY PLANS

3.1 SCENARIOS

The Scenario have been considered for the purpose of calculating caseloads for the Provincial Contingency Plan as under:

3.1.1 LIKELY SCENARIO

While the possibility of Heavy Rains and Riverine Floods cannot be ruled out, keeping in view the Monsoon Outlook issued by Pakistan Meteorological Department which indicates an active Monsoon in 2016. The inflow is likely to increase due to heavy rainfall in different parts of Country, Moreover a monsoon weather system over the upper catchment area of major rivers may create alarming situation. Keeping in view, the unusually high temperature being experienced in pre-monsoon time coupled with expected heavy rains, possibility of floods is being anticipated for Province of Sindh.

Therefore, the caseload is primarily based on anticipated displacement from slums, low lying areas and katcha areas.

3.1.2 WORST CASE SCENARIO

The consecutive Monsoon Disasters in last six years in Sindh has almost affected whole Province which reflects that worst scenario could be a combination of very heavy rains in upper and lower catchment areas, High releases of water from Dams coupled with cloud burst over hills and cities. Such a scenario can never be ruled out and the population affected could be 30-40% of the total population of the province with almost all of the districts affected.

3.2 OVERVIEW OF DIVISIONAL PLAN

3.2.1 LARKANA DIVISION

Larkana Division is prone to both Riverine and Flash Floods 3 out of 5 Districts .i.e Jacobabad, Kashmore and Kamber are highly prone to Flash Floods due to water gushing from hill torrents of Baluchistan, whereas Larkana and Shikarpur are prone to Riverine floods.



Fig. 3 Map of Larkana Division

The plans anticipated the likely caseload based on the population to be possibly affected due to riverine and flash flooding, the population is 362,087 (approximately 60,347 households/families) in likely scenario case of Larkana Division. The caseload is calculated on 5% of the total population.

District	Likely
Larkana	13,330
Kamber	11,208
Kashmore	8,351
Shikarpur	10,597
Jacobabad	16,875
Total	60,347

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been worked out in which roles and responsibilities of government departments/offices have been identified in details. Thus various committees have also been constituted at district level.

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.2 SUKKUR DIVISION

The entire Sukkur Division is prone to Riverine Floods. All Districts of the Division are highly prone to Riverine floods due to passage of River Indus.



Fig. 4 Map of Sukkur Division

The plans anticipated the likely caseload based on the population to be possibly affected due to riverine and flash flooding, the population of 280,000 (approximately 46,666 households/families) in likely scenario case of Sukkur Division. The caseload is calculated on 5% of the total population

District	Likely
Sukkur	12,500
Khairpur	19,166
Ghotki	15,000
Total	46,666

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been worked out in which roles and responsibilities of government departments/offices have been identified in details. Thus various committees have also been constituted at district level.

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.3 HYDERABAD DIVISION

The Hyderabad Division is prone to multiple monsoon hazards i.e riverine, flash, urban and LBOD floods.

- Hyderabad District is prone to both Riverine and Urban Flooding;
- Dadu and Jamshoro are prone to Riverine and Flash Flooding;
- Thatta, Sujjawal, Matiari and Tando Muhammad Khan District are prone to Riverine
- Low lying areas of Tando Allahyar district is prone to Urban Flooding.
- Badin is prone to LBOD flooding



The plans anticipated the likely caseload based on the population to be possibly affected due to riverine and flash flooding, the 494,685 population (approximately 82,447 household) in likely scenario case of Hyderabad Division. The caseload is calculated on 5% of the total population

District	Likely
Hyderabad	17,963
Dadu	12,354
Jamshoro	6,994
Matiari	6,308
Thatta	7,015
T.M Khan	4,820
Sujjawal	6,361
Badin	15,000
T.Allahyar	5,628
Total	82,447

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been worked out in which roles and responsibilities of government departments/offices have been identified in details. Thus various committees have also been constituted at district level.

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.4 SHAHEED BENAZIRABAD DIVISION

The Shaheed Benazirabad division is a new division recently notified by the Government of Sindh. Three districts constitute this new division i.e Shaheed Benazirabad, Sanghar and Naushehro Feroze district.



Shaheed Benazirabad and Naushehro Feroze districts are prone to riverine flooding and Sanghar district is prone to LBOD Flooding.

The plans anticipated the likely caseload based on the population to be possibly affected due to riverine and flash flooding, the population of 257,047 (approximately 42,841 households/families) in likely scenario case of Shaheed Benazirabad Division. The caseload is calculated on 5% of the total population

District	Likely
Shaheed Benazirabad	13,333
N. Feroze	16,66
Sanghar	12,841
Total	42,841

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been worked out in which roles and responsibilities of government departments/ offices have been identified in details. Thus various committees have also been constituted at district level.

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.5 MIRPURKHAS DIVISION

The Mirpurkhas Division is prone to multiple monsoon hazards i.e urban and LBOD floods. Mirpurkhas Division consists of three districts i.e. Mirpurkhas, Umerkot and Tharparkar.



The plans anticipated the likely caseload based on the population to be possibly affected due to riverine and flash flooding, the caseload of 172,367 population (approximately 28,727 household) in likely scenario case of Mirpurkhas Division. The caseload is calculated on 5% of the total population

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in

accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been worked out in which roles and responsibilities of government departments/ offices have been identified in details. Thus various committees have also been constituted at district level.

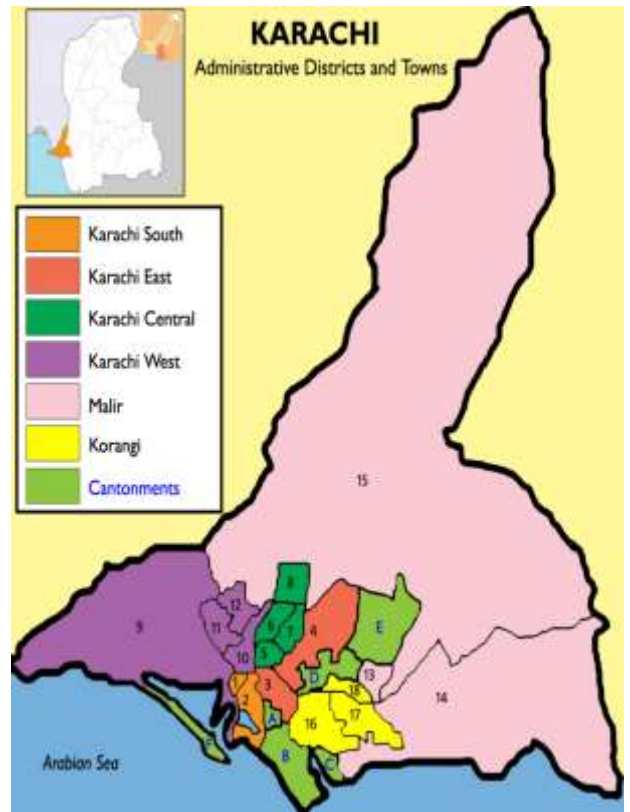
District	Likely
Mirpurkhas	8678
Tharparkar	10,831
Umerkot	9,218
	28,727

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.6 KARACHI DIVISION

The Karachi is the Mega City of Pakistan with a population of approx: 20 million and is the Industrial Hub. The entire Division is to prone Urban Flooding.

Karachi division and surroundings are criss-crossed by many Nallahs which generally flow from North East to South West. These Nallahs act as Natural drains and carry storm water from Kirthar Range down till sea. The major rivers in the area are Malir River in the East and Lyari River in the West, which further have their own small tributaries



(Nallahs), which originates from Khirthar Range, as identified which caused flooding in Karachi Division. Based on the experience of floods of 2013, it can be generally concluded that the Drainage of Karachi is dependent on Rivers/ Nallahs, which may cause Flooding, due to overflow.

The plans anticipated the likely caseload based on the population to be possibly affected due to urban flooding, the caseload of 728,490 population (approximately 120,915 household) in likely scenario case of Karachi Division. The caseload is calculated on 5% of the total population

District	Likely
East	17714
West	24302
Malir	12331
Korangi	18441
Central	27373
South	15056
Cantonment	5695
Total	120,915

Early warning system has been specified and safe evacuation sites have been identified along with evacuation plans for vulnerable districts in accordance to their vulnerability. Moreover, an elaborated coordination mechanism has been

worked out in which roles and responsibilities of government departments/ offices have been identified in details. Thus various committees have also been constituted at district level.

Preparations are based on worst case scenario in the light of experiences and lessons learnt from unprecedented floods and heavy monsoon rainfalls witnessed in the past.

3.2.7 EXPECTED CASELOAD IN LIKELY SCENARIO

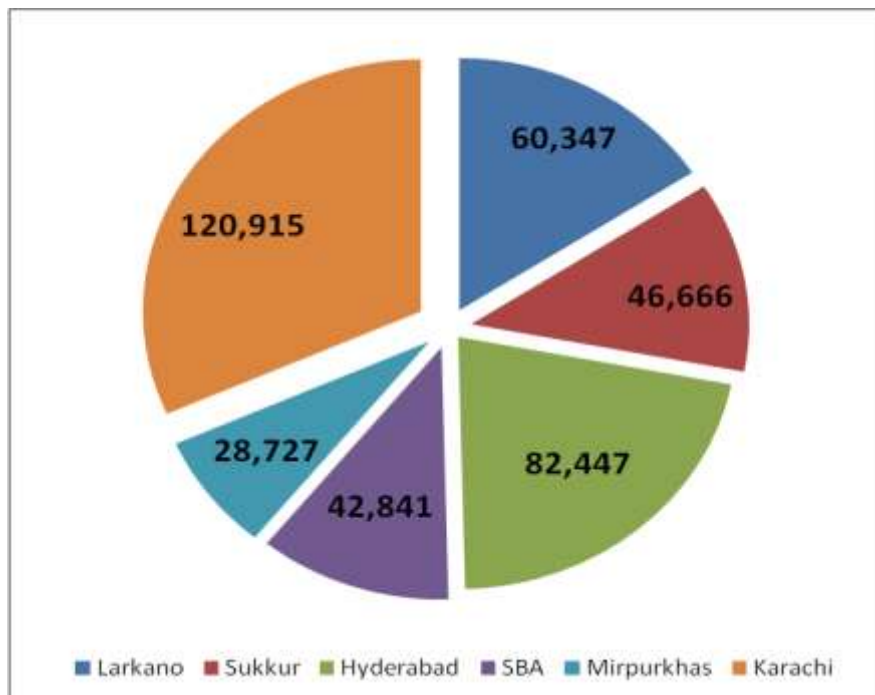


Fig. 9 Caseload in Likely Scenario

3.3 PLANNING PARAMETERS

Preparedness measures have been made/ carried out in the light of following observations

- Possibility of heavy rain induced emergencies, especially due to hill torrents from Koh-e-Suleman and Khithar range cannot be ruled out.
- Level of preparedness of flood protection structure, as indicated by Irrigation Department has improved manifolds.

- Level of preparedness of Disaster Management Authorities, especially of Districts that are vulnerable to floods / urban flooding have been improved through capacity building programs.
- Division / Districts are expected to meet the needs of their respective caseloads, for the likely scenario from within their own resources. PDMA and other agencies will facilitate in generating additional resources in case the magnitude of disasters exceeds local capacities.
- The contingency planning will cater for the humanitarian needs of the affected population for four weeks i.e the time required to mobilize additional resources, if needed.
- The preparatory measures on DRR, undertaken so far, are likely to considerably reduce / mitigate the likelihood of floods and its adverse consequences.

3.4 STOCKING LEVELS NEED AND GAP ANALYSIS FOR RELIEF

The gap for Relief has been calculated on the basis of Relief Stores available with PDMA on the onset of Monsoon 2016. Following relief stores will be available with PDMA.

3.4.1 LIKELY SCENARIO

Caseload: 381,943

S. NO.	Items	Available	Need	Gap
1	Shelters/ Tents	65,066	190,971	125,905
2	Plastic Sheets	712		
3	Food Baskets	-		190,971
4	Mosquito Nets	74,700	190,971	116,271
5	Blankets	64,500	190,971	126,417
6	Solar LEDs	10,485	190,971	180,486

Need & Gap in Likely Caseload Scenario is based on 50% of affected population to be catered

Inventory of stocks available with PDMA and the other relief items / heavy machinery, earth moving equipment held by Districts Administrations are at **Annex- B and C** respectively.

3.5 BROAD CONTOURS OF THE PLAN

Respective DDMA's, backed by PDMA would be the first responders in case of flood situation.

- Early warning of approaching weather system will be provided by PMD/FFD and communicated to all concerned by DDMA's. DDMA's are expected to translate weather forecast and flood warnings into usable early warning for vulnerable communities and ensure its timely dissemination to all concerned.
- In case, there is continuous rise in river water level the people residing in Katcha Areas will be evacuated to the safer places, which is estimated to be 2.6 million as of the report of 2014. The details are at **Annex – D**.
- Threatened population will be evacuated by DDMA's as per prepared plan.
- DDMA's would be responsible for provision of search and rescue, medical and emergency responses.
- Camps will be established at pre-selected sites by DDMA's.
- All Division / Districts must be ready to handle the initial caseloads within their own mechanism and resources.
- DDMA's would be responsible for effective and transparent relief distribution including relief provided by PDMA, NDMA and other Humanitarian Agencies.
- All stakeholders would take necessary actions to facilitate early recovery and rehabilitation of affected population.
- In case the districts fall short of meeting the humanitarian needs, PDMA will assist by making available the required stocks. In case when disaster exceeds capacities of the provincial government, NDMA will be requested to make available the additional stocks from national reserves, prepositioned across the Country.
- When required, Armed Forces may be requested for assistance by PDMA Sindh at any stage, particularly for rescue, evacuation and emergency

relief phases. Thus, the DDMA's will have to submit the request to PDMA for assistance of armed forces in aid of civil administration.

- Special requirements of Aviation / Naval support by any agency will be coordinated by PDMA.
- Resources of Government Departments and Agencies such as, Pakistan Red Crescent Society and domestic philanthropy may be requisitioned, if the intensity of the situation so entails for an effective response.

CHAPTER-4

COORDINATION MECHANISM

PDMA will coordinate with key National Stakeholders including PMD, FFC, Armed Forces, Federal Agencies, DDMA's and Line Departments for management of the entire spectrum of Provincial Disaster Response. System of coordination of PDMA is depicted below.

4.1 MITIGATION

4.1.1 MINISTRY OF WATER AND POWER

The ministry is responsible for the overall flood management and impact mitigation efforts through its attached departments (FFC, WAPDA, PCIW and IRSA). The Ministry deals with monitoring of preventive and preparedness measures as well as resource allocation for the protection works.

Federal Flood Commission implements Flood Risk Mitigation Projects which include flood protection works as well as flood forecasting/ warning system improvements. As part of preparedness measures for Monsoon Season 2016, FFC has undertaken the following:-

- Countrywide monitoring of flood works.
- Comprehensive Flood Management Plan for 10 years initiated.
- In case of Exceptionally High Floods, parts of the discharges are managed by breaching the bunds on the pre-determined sites for safety of the main Hydraulic Structures (Bridges & Barrages) and main cities.

4.1.2 WATER & POWER DEVELOPMENT AUTHORITY

WAPDA reinforces floods impact mitigation through operational management of major water reservoir i.e. Tarbela, Mangla Dams and Chashma

Barrage. It strengthens national flood early warning system through deployment of flood telemetry system.

4.1.3 INDUS RIVER SYSTEM AUTHORITY (IRSA)

IRSA defines the dam/water storage and release policy as part of its mandate during the Rabi and Kharif season.

4.1.4 IRRIGATION DEPARTMENT

It undertakes implementation of flood protection works, monitor flow in flood prone rivers and water channels, reinforce floods early warning and execute technical responses, O&M of existing flood protection infrastructure besides restoration and repair of damaged flood protection works.

4.2 EARLY WARNING

4.2.1 PAKISTAN METEOROLOGICAL DEPARTMENT (PMD)

PMD has a broad mandate of supporting agro-based economic activities, air and maritime traffic safety, disaster mitigation efforts and disseminating weather forecast to numerous end users. PMD will ensure the following during monsoon season:

- Inform public on the weather forecast and issue warning in case of potential threat.
- Collect rain data on a regular basis, consolidate and share it with all concerned.
- Disseminate flood information to the NDMA/ PDMA on a daily basis during flood season.
- Share weather forecasts and early warning information with NDMA, F/G/S PDMA's, and the Media on a regular basis in the monsoon period.

- Coordinate with FFC, WAPDA, PCIW, FFD, and SUPARCO in the Monsoon period to generate flood warning where wanted.

4.2.2 FLOOD FORECASTING DIVISION (FFD)

FFD is an affiliated organization of PMD. It disseminates flood early warning and river flow updates to relevant National, Provincial and District Governments and National Response Agencies, especially in the context of Monsoon Season.

4.2.3 PAKISTAN SPACE & UPPER ATMOSPHERE RESEARCH COMMISSION (SUPARCO)

SUPARCO deploys its satellite imagery capacities for disaster impact mitigation and also for early warning of disaster occurrence and trends monitoring. SUPARCO will play the following role during monsoon season:-

- Provide remote sensing and satellite maps before and during disasters in order to show their impact.
- Provide remote sensing and satellite maps for hazard risk zones to enable relevant agencies to take measures for minimizing damage to population and property.
- Assist post-disaster damage assessment.

4.3 RESPONSE AGENCIES (FEDERAL GOVERNMENT)

4.3.1 NATIONAL DISASTER MANAGEMENT AUTHORITY (NDMA)

- National Emergency Operation Center (NEOC) is activated in NDMA, Islamabad for monitoring of the situation and coordination of possible response during monsoon season 2016 on 24/7 basis. The NEOC will always be manned by a Duty Officer who functions under the overall supervision of Director (Response), NDMA.
- Coordinates emergency response of the Federal Government in the event of a National level Disaster through the NEOC.

- Require any Government Department or Agency to make available such staff or resource that are available for the purpose of emergency response, rescue and relief.
- Organize initial and subsequent assessment of disaster affected areas and determine the extent of loss/damage and volume of relief required.
- Coordinate and inform all concerned Department to get prepared for emergency response.
- Coordinate with Armed Forces, INGOs, UN Bodies and Philanthropist Organizations for resource mobilization.
- Mobilize and deploy resources e.g. search and rescue medical teams in the affected areas.
- Supply of food, water, medical supplies and NFIs to the affected population.
- Prepare a transition plan from relief to recovery program.

4.3.2 ARMED FORCES

The Armed Forces mobilize and deploy resources when called upon by District / Provincial / National DMAs and provide assistance in Search and Rescue, Evacuation, Camps Establishment and Management, provision and distribution of relief to the affected populations and provision of emergency medical services. The flood control centers will also be established from 15th June, 2016. Army, Pakistan Navy and Pakistan Air Force, which will also share information on resource deployment and flood management with respective PDMA/ NDMA on daily basis. The summary of flood relief equipment of Government of Sindh available with HQ Corps 5 is at **Annex- G**

4.3.3 PAKISTAN COAST GUARDS

Pakistan Coast Guards augment coastal search & rescue and relief operations on required basis.

4.3.4 NATIONAL HIGHWAYS AUTHORITY (NHA)

NHA is responsible for building and maintaining highways and motorways in Pakistan. It ensures road access during monsoon season.

4.3.5 PAKISTAN RAILWAYS

Pakistan Railways is an important organ which ensures access during monsoon season. To deal with a possible flood Situation, Flood Emergency Centers will be established as usual in 7 – operating Divisions of Pakistan Railways (Peshawar, Rawalpindi, Lahore, Multan, Sukkur, Quetta and Karachi).

4.4 RESPONSE AGENCIES (PROVINCIAL GOVERNMENT)

4.4.1 PROVINCIAL DISASTER MANAGEMENT AUTHORITY SINDH

Pre-Disaster

- DG PDMA in consultation with Chief Secretary Sindh will be responsible for response & relief operations. Director General PDMA on his behalf will head a Composite Team (comprising representatives of Lead Agencies/ Departments and focal persons of support organizations) to coordinate response & relief operations.
- Provincial Emergency Operation Centre would be made operational during the 2nd week of June 2016, so as, to make all arrangements for receiving forecast data from PMD and its dissemination.
- The PEOC will be functional till the termination of monsoon season / emergency.
- The PEOC shall receive and transmit flood/ water level information thrice in flood season and on hourly basis during emergency.
- Identification of available resources i.e. machinery, tents etc., and Gaps.
- Contingency planning as to identify role of each stakeholder during emergency.

- Ensuring coordination between line departments & other stakeholders for any emergency, through workshops, trainings etc.
- Assisting DDMA's in provisions of adequate required resources for monsoon season.
- An inventory of NGOs working in these areas will be prepared prior to the crisis, in order to mobilize them quickly in case of emergency.

During-Disaster

- The coordination and collection of information and resources to support disaster/emergency incident management activities.
- The PEOC will be a central coordination, command and control facility responsible for carrying out emergency preparedness and emergency management functions at a strategic level in an emergency situation, and ensuring the continuity of response operations.
- Tents, Plastic Sheets, Mosquito Nets, De-watering Pumps, Water Purifying Filters, Jerry Cans and boats, are being procured to be placed at the disposal of DDMA's.
- The PDMA will arrange the transportation of food and other relief items to the Flood Displaced Persons (FDP) for further distribution. District Administration will be requested to distribute the relief goods.
- PDMA shall undertake need based coordination with all UN agencies and other humanitarian partners to fill in the response and relief gaps before, during and after floods.
- PDMA has coordination with all UN agencies and humanitarian partners to maintain a stock (food and NFI including shelter).
- Prepare daily situation reports and circulate to all concerned as per

Annex- F.

Post-Disaster

- The PDMA in collaboration with partners will have to closely monitor the situation on regular basis. Logistic arrangement should be done in

advance keeping in view the positions available in the case of crises. An initial rapid assessment will be carried out to identify the areas and targeted beneficiaries.

- Continue with relief and early recovery operation till affected people are settled back to their original abode and economic activity is resumed.

4.4.2 DISTRICT DISASTER MANAGEMENT AUTHORITY

- DDMA shall activate District Emergency Operation Centers (DEOCs)
- In the event of a disaster, organize emergency response through the District Emergency Operation Center (DEOC)
- Setup early warning mechanisms and dissemination of proper information to public, prepare district level response, plans and guidelines, establish stockpiles of relief and rescue material; provide information to PDMA on different aspects of Disaster Management.
- Inform / update PDMA regarding the overall situation.
- Organize evacuation on priority basis.
- Conduct initial and subsequent assessment of disaster affected areas and determine the extent of loss and damage.
- Collect information on damage status and promptly plan for the resources requirement for relief operation and share it with the PDMA.
- Provide food, drinking water, medical supplies and NFIs to the affected population
- Preferably set up tent cities/ relief camps on open land and provide relief to the affectees in camps (Annex-E).
- Coordinate with PDMA to deploy resources for emergency response.
- Mobilize community volunteer groups and civil defence for emergency operations.
- Forward timely situation reports (SITREP) on daily basis to PDMA for its timely dissemination to concerned quarters.
- Ensure registration of all relocated population in the camps and overall affected population on gender segregated basis.
- Prioritize vulnerable segments of society in their relief operations.

- Facilitate early return of relocated population and help in restoring their livelihoods.

4.4.3 HEALTH DEPARTMENT

Pre-Disaster

- Provide specific information required regarding precautions for epidemics
- Establish a health mobile team in district & town headquarter hospital
- Setup an Information Center to collect and share information amongst relevant stakeholders.
- Collaboration with relevant organizations/partner NGOs.
- Stocking of life saving drugs and vaccines.

During-Disaster

- Providing emergency treatment to the affected
- Provision of First-aid & water testing kits, chloramines and anti-snake venom serum & other emergency support
- Deployment of mobile medical teams & health staff
- Collaboration with all relevant stake holders

Post Disaster

- Establishment of medical camps, vaccination, ensuring safe food & water in camps
- Conduct impact assessment on health, intervene to stop outbreak of diseases
- Rehabilitation of health infrastructure

4.4.4 EDUCATION DEPARTMENT

Pre-Disaster

- Providing the necessary information, training to teachers & students regarding disasters with tips to save their families & themselves during disaster.
- In collaboration with Civil Defence and Boy Scouts / Girl Guides Association and gear up the volunteers force.
- Educate students about Health care Precautions

During-Disaster

- Mobilize the human resources for intervention during disaster
- Arrangement for evacuees to setup relief & temporary shelter camps
- Deployment of volunteers for camp management & emergency support

Post-Disaster

- Assessment of damages & needs of affected educational institutes
- Rehabilitation of affected educational institutes
- Continuing Education of children at camps and helping them to recover from shock by providing toys etc.

4.4.5 AGRICULTURE DEPARTMENT

Pre-Disaster

- Assessment of high risk prone areas and estimation of possible damage
- Create community Seed Bank at UC level
- Regular surveillance of Irrigation water supplies
- Close coordination with Meteorological Department & other stakeholders for weather information.
- Testing, functioning and pre-positioning the available machinery.

During-Disaster

- Immediate mass awareness and update of situation
- Arrangements for relief & temporary shelter camps in canal rest houses

- Vigilance for protection of Agriculture crops.
- Immediate activation of machinery and equipment.

Post-Disaster

- Assessment of damages & needs of affected crop area and submit to DDMA
- Assistance in repair & rehabilitation of Irrigation Systems.
- Timely compensation to affected farmers
- Mass awareness campaigns regarding epidemics & diseases to crops
- Inform the affected population regarding the land use and crop management on damaged / devastated areas.

4.4.6 LIVESTOCK AND FISHERIES DEPARTMENT

Pre-Disaster

- Estimation of possible damage
- Mass Awareness regarding precautions
- Close coordination with Agriculture, Irrigation, Meteorological Department & other stakeholders.
- Vaccination of livestock.
- Stocking of fodder and vaccines.

During-Disaster

- Update local communities of ongoing situation.
- Provide livestock vaccination
- Arrangements for relief & transportation of livestock.
- Provision of fodder for livestock in affected area.

Post-Disaster

- Assessment & submission of damages & need of affected livestock to DDMA
- Timely compensation to affected livestock owners
- Mass awareness campaign regarding epidemics & diseases to livestock

4.4.7 PLANNING & DEVELOPMENT DEPARTMENT

Pre-Disaster

- Gathering statistical data regarding possible damages & recovery needs from all relevant departments
- Plan & identify potential resources
- Facilitation to other department in planning

Post-Disaster

- Gathering statistical data regarding actual damaged & recovery needs from all relevant departments
- Plan & Identify potential resources
- Facilitation other departments in planning and execution of rehabilitation in cost effective manner
- Coordinate with all line departments

4.4.8 REVENUE DEPARTMENT

Pre-Disaster

- Assessment of high risk prone areas and estimation of possible damage and needs for recovery.
- Arrangement of financial resources.
- Identification of high grounds for establishment of tent cities.

During-Disaster

- Establish relief distribution centers/ camps and accept relief donation/ relief support
- Timely release of funds to PDMA.

Post-Disaster

- Assessment of damages of Industrial/ Business, Crops and Livestock and Settlement of applicable taxes accordingly
- Support PDMA in conduct of authentic damage assessment and compensation need.

4.4.9 POLICE DEPARTMENT

Pre-Disaster

- Information dissemination through "15 helpline Service" to local residents
- Prepare Contingency Plan, Teams & their training for emergency intervention.
- Deploying and give security cover to government agencies which are working / preparing for the monsoon season in areas where Law and Order is not good.

During-Disaster

- Rescuing affected, shifting, to hospitals and corpse disposal
- Providing easy access & security to rescue & relief teams.
- Maintain law & order and divert traffic on alternative safe routes as and when necessary.
- Maintaining Law and Order and provide security to relief stock piles and camps.

Post-Disaster

- Ensure security to workers of NGOs/INGOs
- Provide security in Un-safe areas
- Facilitation to institutions/NGOs/INGOs which focus on rehabilitation activities.

4.4.10 CIVIL DEFENCE

Pre-Disaster

- Information sharing regarding technical and personnel expertise with PDMA and DDMA.
- Conduct training for volunteers in first aid & other activities
- Effectively train & mobilize volunteers and initiate mass awareness regarding necessary first aid-rescue activities

During-Disaster

- Deployment of volunteers at the disposal of DDMA for Rescue, Evacuation and initiated basic first aid.
- Communicate to DEOC any additional resources required for performing Rescue and Evacuation Activities
- Taking precautionary measures to stop Fire-incidents in camps and perform Fire fighting in emergency.
- Management of relief camps where required.

Post-Disaster

- Identify gaps, make future plan to overcome weaknesses
- Assisting District Administration and other Line Departments in Rehabilitation works

4.4.11 SCOUTS

Pre-Disaster

- Nominate the Scouts Districtwise from Riverine Districts which can be trained to handle flood emergencies
- Training will be imparted in the Scouts regarding Boat Handling and first response to the affectee during the emergency.

During-Disaster

- Trained scouts will be deployed / placed at the disposal of Deputy Commissioner
- The Scouts will perform the duties as per training and will report to respective Deputy Commissioner

Post-Disaster

- The trained Scouts would continue to impart the training in other scouts and volunteers in their respective districts.

4.5 STANDARD OPERATING PROCEDURES (SOPs)

- All the departments shall immediately prepare a comprehensive and up-to-date Contingency Plan for combating expected heavy rains and carrying out the Rescue and Relief work including the details of available staff, vehicles, machinery equipments and other resource in close coordination with PDMA, These all must be kept ready to mobilize / use to combat any emergency during the Monsoon season 2016.
- The Deputy Commissioners shall keep close liaison with all departments like Local Government, Health, Agriculture, Civil Defence, Irrigation, Works & Services, Education & Literacy, Police & other Law enforcement Agencies. Meetings in this regard are to be held on regular basis with concerned departments and minutes are to shared with other Divisional Commissioners and PDMA.

- If there is likelihood of heavy rains and flood emergency would be declared in the District and all Government functionaries and NGOs would be kept on high alert.
- Control Rooms would be established at District and Taluka level in the offices of the Deputy Commissioners. Assistant Commissioner, Mukhtiarkars (Revenue) and all other line departments during the Rain/Flood emergency. These shall Control rooms shall function round the Clock.
- The Executive Engineers Irrigation will establish round the clock control rooms in their offices for making liaison with all concerned & activate contingency Plan of the department. They shall identify the vulnerable points of the LBOD Sim-Nalahs / and all other irrigation canals and intimate PDMA before 30th June. They will be in touch with PDMA and the Meteorological Department & inform the concerned agencies about any development emergency. They will make special arrangements for watching and patrolling of vulnerable points and ensure that embankments remain in stable condition.
- Immediate arrangements for necessary machinery, sand bags and other material to be used for strengthening of embankments of canals and plugging breach shall be ensured and availability of communication network must be made at all vulnerable points.
- The Executive Engineers Irrigation I LBOD shall ensure regular, timely and proper de-silting of all canals, distributaries, drains, sub-drains and submit a certificate to his higher authorities with an information copy to PDMA. .
- The Deputy Commissioners shall ensure activation of Central District Control Rooms and already established control rooms at each Mukhtiarkar (Revenue) Offices round the clock, under the supervision of Assistant Commissioner concerned. They shall also ensure preparedness at proposed relief camps and also ensure immediate evacuation of people residing in low-lying areas to safer place/ relief camps, if required. He shall also make

immediate arrangements for the availability of sufficient quantity of relief Material like food, blankets, tents- plastic sheets etc.

- The Deputy Commissioners shall constitute Supervisory Committees for relief works at district level.
- The Deputy Commissioner must further ensure that special attention is given to the disabled people and women and children and extra ordinary measures are taken for such purpose.
- The Deputy Commissioner shall nominate the Assistant Commissioner as focal persons to coordinate with the Taluka and Town level local councils for drainage of accumulated rain water during monsoon season-2016.
- The Assistant Commissioners of the sub-division/ Taluka shall be focal persons in Talukas for the entire operations of rescue and relief. They must ensure the respective arrangements for tractor trolleys and manpower in coordination with Civil Defence, Boy Scouts Association and Police Department if needed and mobilize the village staff in the pre-and-post emergency work. They shall also ensure proper distribution of relief material among the actual needy persons.
- The Executive Engineer Drainage Division (LBOD), Irrigation Department shall ensure availability of bulldozers, excavators and earthmoving machines in sufficient number .and in proper working and ready to use condition in case of emergency.
- The Director Agriculture shall make arrangement for protection of standing crops from damages and diseases that may be caused from the stagnant rainwater in the fields. He shall manage required machinery from mechanical wing and must have the inventory of such machinery and equipment.
- The Deputy District Officer, Animal Husbandry Livestock and his staff shall ensure safety of livestock from flood diseases and losses and Veterinary Officers shall ensure regular and timely vaccination of cattle in the districts. They shall make all necessary arrangements for fodder for the livestock to be shifted from marooned areas.

- The Deputy Controller, Civil Defence should ensure the enrolment of volunteers as early as possible in order to avoid any chaotic situation during emergency. He will continuously remain updated of weather forecast reports and with meteorological departments and will make arrangements for warnings in emergency situation through sirens, loudspeakers and media at Taluka and village level. He shall ensure presence of the Razakars / volunteers and scouts for rain relief and rescue activities in case of any emergency.
- The Deputy Director Food shall ensure availability of sufficient stock of wheat and other grains and shall coordinate with Deputy Commissioners for supply of ration/ food grains from local Food Grains dealers in case of need. He will also ensure that no stocks of government wheat, placed at depots, are damaged due to water accumulation, fire or rioting.
- The Executive Engineer K-Electric / HESCO / SEPCO, shall ensure that no case of electrocution occurs due to negligence of their respective departments and no loose wires are suspended from the electric poles. In case of any breaking of live electric wires immediate steps shall be taken for repair, Inspection of transformers.
- The Divisional Engineer Telephone, ensure full function-ability of telephones all over the district and provide assistance to all departments on demand at the, time of need.
- The Zonal Manager Sui-Southern Gas company ensure continuous supply of gas and proper safety of gas lines throughout its network in the districts of this division. He shall ensure immediate repair work in case of any damage to the gas lines.
- The Deputy Commissioners shall ensure mobilization of the NGOs and business community in the rescue and relief activities in case of emergency

and shall depute volunteers on different emergency tasks.

- The Regional Director, Information shall keep close liaison with all control rooms of the division to provide correct and exact information to media regarding emergency. He shall also arrange briefings about the latest situation in case of emergency.
- The Red Crescent Society and other welfare associations and NGOs of the district shall provide food packets and other required material to the affected persons in relief camps in case of emergency.
- Proper arrangement for lifting of trees fallen due to heavy rain and gusty winds from the main Highways / Roads shall be made by the Executive Engineer, Provincial. Highways department.
- The incharge Utility Store Corporation shall ensure the availability of sufficient stock of edible items in case of need.
- The Revenue Department shall also conduct the survey of any loss of life houses, cattle, standing crops and other infrastructure after the heavy rains/floods-2016. In case of the highest degree of emergency, Pakistan Army may be requested for helping the district Administration in rescue and relief Operations.

4.6 IMPORTANT CONTACT NUMBERS

They are **annexed at H.**

Annex – A

HISTORY OF PAST FLOOD EVENTS

Year	Deaths	Injured	Houses Destroyed	Houses Damaged	People Affected	Cattle Lost	Villages Affected
2013	47	43	14095	21400	534834	88	3068
2012	280	3687	116849	247851	3088970	849	12915
2011	462	756	608579	694519	8634995	104277	36008
2010	475	837	372089	245872	8065846	398769	13649
2008	40	29	3583	13026	0	219	0
2006	162	0	0	113475	1570881	5	95
2003	407	235	0	246464	831157	3618	3243
1995	114	0	21189	0	504455	1397	823
1994	264	0	129387	355554	690035	6090	7894
1992	232	0	239238	269085	0	66512	0
1988	8	0	0	16445	175000	25	1

STOCK AVAILABLE AT PDMA SINDH

S.#	ITEMS	Total
1.	TENTS	65,066
2.	MOSQUITO NETS	74,700
3.	MOSQUITO REPELLENT	1,000
4.	BLANKETS	64,500
5.	PLASTIC MATS	712
6.	GENERATOR	8
7.	DE-WATERING PUMPS	120
8.	WATER TANK	25
9.	WATER FILTERS	1800
10.	LIFE STRAW PURIFIER	1820
11.	RESCUE BOATS	81
12.	RESCUE RUBBER BOATS	10
13.	SOLAR LED LIGHTS	10,485
14.	ENGINE OBM 30 HP	50
15.	LIFE JACKETS	4,000
16.	SLEEPING BAGS	69
17.	JERRY CAN	230
18.	BED SHEETS	56 ctn
19.	SPRAY PUMPS	07
20.	SLEEPING BAGS	69 ctn
21.	PHILPS LIGHTS	91

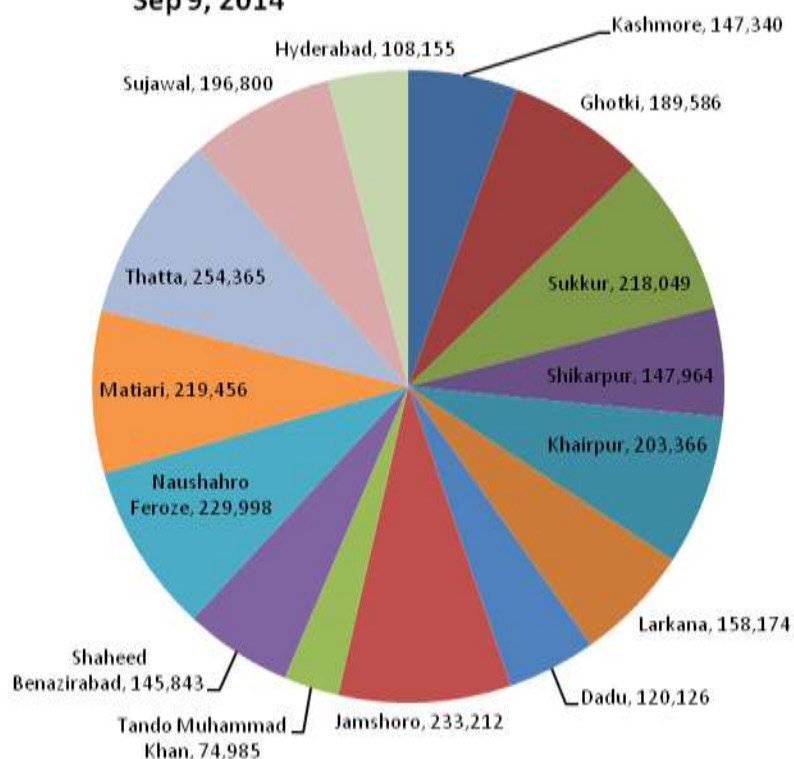
PREPOSITIONING OF RELIEF ITEMS AT THE DISPOSAL OF-----

Sr.	District	Tents (Nos.)	Mosquito Nets (Nos.)	Mosquito Repellent(Ctn)	Boats

ANNEX – E**Estimated Population at Risk in Katcha Areas of Sindh; (Reported as of Sep 9, 2014)**

District	At Risk Pop
Kashmore	147,340
Ghotki	189,586
Sukkur	218,049
Shikarpur	147,964
Khairpur	203,366
Larkana	158,174
Dadu	120,126
Jamshoro	233,212
Tando Muhammad Khan	74,985
ShaheedBenazirabad	145,843
NaushahroFeroze	229,998
Matiari	219,456
Thatta	254,365
Sujawal	196,800
Hyderabad	108,155
Total	2,647,419

**Estimated At-Risk Population in Katcha Areas of Sindh
Sep 9, 2014**



S.No	District	Taluka	Vulnerable Union Councils	At-Risk Population in Katcha Areas
1.	Kashmore 147,340	Kandhkot	Dari (Ghouspur)	17404
			Haibat	18963
		Kashmore	Gublo	16440
			Badani	18494
			Gihalpur	20167
			Sodhi	20383
			Kashmore Colony-1	20239
			Khewali	15250
2.	Ghotki 189,586	Ghotki	HussainBeli	18775
			Kadirpur	26993
			Bagodeho	21246
			Ruk	17346
		Ubauro	Ranwat	30791
			Langho	23534
			Wastijiwan Shah	25364
			Khambra	25537
3.	Sukkur 218,049	New Sukkur	Bagerji	15551
			Arain	15431
			Tamachani	12,240

	PanoAqil	Sadhuja	18014
		Nauraja	19215
		Sangi	21364
		Hingoro	15875
	Rohri	Ali Wahan	16115
		Arore	18620
		Panhwar	24009
		LoungBhatti	22567
		Patni	19048
	4. Shikarpur 147,964	Khanpur	GarhiThegho
MehmoodaBagh			19742
Lakhi		Sehwani	18759
		Chak	17746
		Lakhi	16117
		Jehan Khan	11056
GarhiYasin		Mirzapur	15850
		Amrote	16447
		JindoDero	12317

S.No	District	Taluka	Vulnerable Union Councils	At-Risk Population in Katcha Areas
5.	Khairpur 203,366	Sobodhero	Sagyoon	21580
			Pir Hayat Shah	19438
		Gambat	Agra	21479
			Ripri	15289
			Beharlo	19045
			Khemat	14138
		Kingri	Hadal Shah	21649
			Priyalo	24358
			Kot Mir Muha	21956
		Khairpur	Baberilo	24434
6.	Larkana 158,174	Ratodero	Bahman	23196
			Banguldero	24106
		Larkana	Akil	22178
			Phul	23098
		Bakrani	Purano Abad	20956
		Dokri	Bagi	24093
			Karani	20547
7.	Dadu 120,126	Dadu	Pat	22354
			Allahabad	19278
			Phulji Station	19153
			Monder	19877
			Sial	20749
		Mehar	Nao Goth	18715
		8.	Jamshoro 233,212	Sehwan
Channa	19607			
Sehwan	19638			
Sehwan 1	18702			
Manjhand	Amri			18329
	Sann			18098
	Lakh			17547
	Manjhand			24951
Kotri	Allah BachayoShoro			20954
	Jamshoro			20042
	Unerpur (Petaro Proposed)			13618
	Kotri			19042

S.No	District	Taluka	Vulnerable Union Councils	At-Risk Population in Katcha Areas
9.	Tando Muhammad Khan 74,985	Bulri Shah Karim	Saeedpur	22004
			MullanKatira	27292
			JahanSoomro	25689
10.	ShaheedBenazirabad 145,843	Kazi Ahmed	ShahpurJahania	19312
			Dulatpur	20956
			Said Kando	18043
			That	19965
		Sakrand	Gohram Mari	12134
			Bhura	8129
			Mahrabpur	24740
		Mariv	22564	
11.	NaushahroFeroze 229,998	Kandiario	MohabatDero	22076
			Kamaldero	21412
			Abad	21460
			Dabhro	24844
			Bhorti	19604
		NaushahroFeroze	Mithiani	22453
		Moro	Depareja	20942
			Lalia	27351
			FatooBalal	22814
			Gachero	27042
12.	Matiari 219,456	Saeed Abad	Saeed Abad	28991
		Hala	Bhanoth	25572
			Karam Khan Nizamani	26676
			Hala Old	26472
			Hala-2	23537
		Matiari	Sekhat	30531
			Matiari	26797
Shah Alam Shah	30880			

S.No	District	Taluka	Vulnerable Union Councils	At-Risk Population in Katcha Areas
13.	Thatta 254,365	Thatta	Jhurruck	17755
			Jimpir	20614
			Sonda	17897
			Chuto Chand	21264
			KalanKot	1867
			Thatta 1	20002
			Domani	19657
		KetiBander	KetiBander	25700
		Kharochan	Kharo Chan	25666
		Ghorabari	Khan	22008
			Kotri Allah Rakhio Shah	19309
			Mahar	21490
			Udassi	21136
14	Sujawal 196,800	MirpurBathoro	BachalGugo	17996
			Bano	19032
			Liakpur	18592
		Shah Bander	JongoJalbani	20207
			DoulatPur	19267
			Goongani	20362
		Jati	MureedKhoso	20101
		Sujawal	Bijora	20504
			Belo	22272
			Ali Bahar	18467
15.	Hyderabad 108,155	Hyderabad	MasuBhurgari	24362
			Hatri	29719
		Qasimabad	Qasimabad 4	25159
		Latifabad	Latifabad 5	28915

Total 2,647,419

DETAILS OF RELIEF CAMPS

S. No.	Division	District	Number of Relief Camps
1	Hyderabad	Hyderabad	36
2		Thatta	27
3		Dadu	153
4		T.M Khan	16
5		Tando Allahyar	73
6		Matari	31
7		Jamshoro	36
8		Sujawal	57
9		Badin	58
Total			487
10	Mirpurkhas	Mirpurkhas	140
11		Umerkot	25
12		Tharparkar	116
Total			281
13	Sukkur	Sukkur	-
14		Khairpur	-
15		Ghotki	-
Total			-
16	Larkana	Larkana	7
17		Shikarpur	40
18		Kamber	22
19		Kashmore	44
20		Jacobabad	18
Total			131
21	Shaheed Benazirabad	S. Benazirabad	71
22		Sanghar	195
23		N. Feroze	198
Total			464
24	Karachi	South	158
25		Malir	-
26		West	-
27		Korangi	3
28		East	10
29		Central	-
Total			171
Grand Total			1534

(-) Districts not provided relief camp information.



GOVERNMENT OF SINDH
PDMA / RELIEF DEPARTMENT

Annex - G

SUMMARY OF LOSSES / DAMAGES DUE TO RAIN / FLOOD - 2016
Date _____ at -----hours

Sr.	District	Talukas Affected	Villages Affected	Population Affected*	Displaced Persons (DPs)**				Relief Camps Established	Persons in Relief Camps				Crops Area Damaged (Acres)	Persons Died				Persons Injured				Cattle Head Perished	Houses Damaged		
					Male	Female	Children	Total		Male	Female	Children	Total		Male	Female	Children	Total	Male	Female	Children	Total		Partially	Fully	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1								-					-					-				-				-
2								-					-					-				-				-
3								-					-					-				-				-
GRAND TOTAL:					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* The population affected is the over all affected population of the district.

** The Displaced persons are those who depend upon government assistance but do not reside in relief camp.

FLOOD STORES WITH HQ ENGINEER 5 CORPS

S.#	ITEMS	QUANTITY	THIS YEAR PROVIDED	Total
1.	Fiber Glass Boats	170		170
2.	OBM 15 HP	50	-	50
3.	OBM 25 HP	161	-	161
4.	OBM 30 HP	27	10	37
	OBM 48HP	25		25
5.	Life Jackets (All Types)	2021	1500	3521
6.	Search Light	45	10	55
8.	De-watering Pumping Set (All Types)	146	-	146
9.	Anchors	122	-	122
10.	Rubber Boat	10	-	10
11.	Life Ring	748	-	748
12	GPS	-	03	03

* 23 feet = 25 and 14 feet = 15

FLOOD RELIEF EQUIPMENTS PROVIDED TO PAKISTAN NAVY AND COMCOAST

S.No.	Equipment	Navy	COMCOAST	Total
1	Combo (Fish Finders / GPS Gram 421S)	02	--	02
2	Camera – COOLPIX AW110)	01	--	01
3	Goggles / Black Color	07	--	07
4	Fins (Pairs)	07	--	07
5	Under Water Flash Lights	04	--	04
6	Air Cylinder (Diving Cylinder 15 litres)	04	--	04
7	Regular (Diving Regular P-Synchro)	04	--	04
8	Pressure Gauge (Pressure Gauge Console 2)	04	--	04
9	Wet Suit (Body Fit)	04	--	04
10	Budy Lines	02	--	02
11	Jacket Master	04	--	04
12	Weight Belt with pockets	04	--	04
13	Diver Weight (soft weights)	04	--	04
14	Diver Hood (Standard)	04	--	04
15	Diver Gloves	04	--	04
16	Diver Boots	04	--	04
17	Diving Rope (Nyclone)	120 Ft.	--	120 ft.
18	Fiber Glass Boats (14 feet)	--	10	10
19	OBM 30 HP	--	10	10
20	De-Watering Machines	--	05	05
21	Generator	--	02	02