Floods and Drought Management in Pakistan

START

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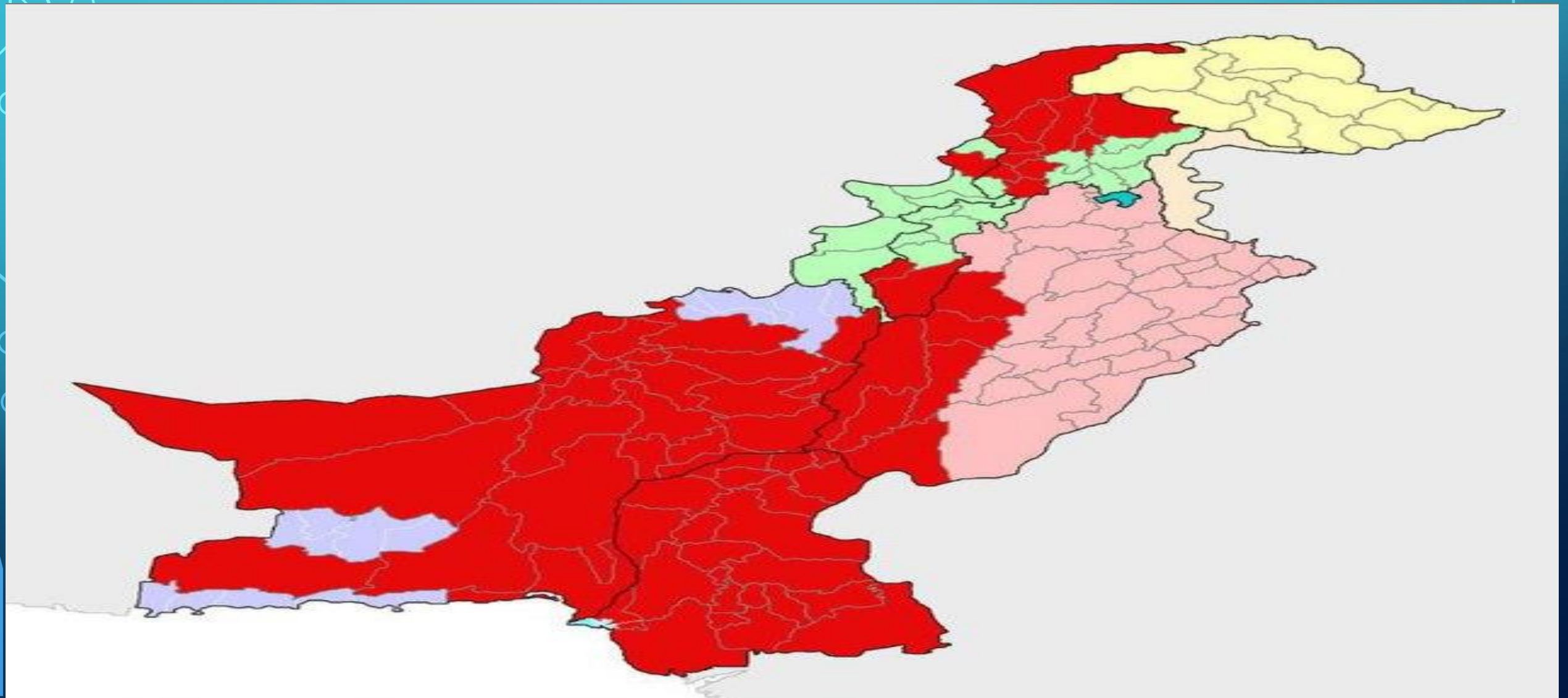
Todi, Italy, 24 August 2023

FLOOD RISK MAP OF PAKISTAN



INTRODUCTION:

Flooding is the most devastating natural hazard in Pakistan and the recent flooding of 2022 has demonstrated its severeness. Floods are common throughout the country. However, their characteristics differ from region to region. Monsoon rainfalls are the main source of floods in the Indus Basin. Floods are recurring events in Pakistan. Pakistan has been experiencing floods mainly because of its topography, Sindh, Kabul and Swat rivers are three hazard prone rivers, and due to climatic and ecological condition, Pakistan constantly received flooding every year.

FEDERAL FLOOD COMMISSION *ESTABLISHMENT*

- Prior to 1976, the Provincial Governments were responsible for planning and execution of flood protection works

- Disastrous floods of 1973 and 1976 resulted in heavy losses indicating that existing flood protection facilities and planning were inadequate to provide effective protective measures for the country

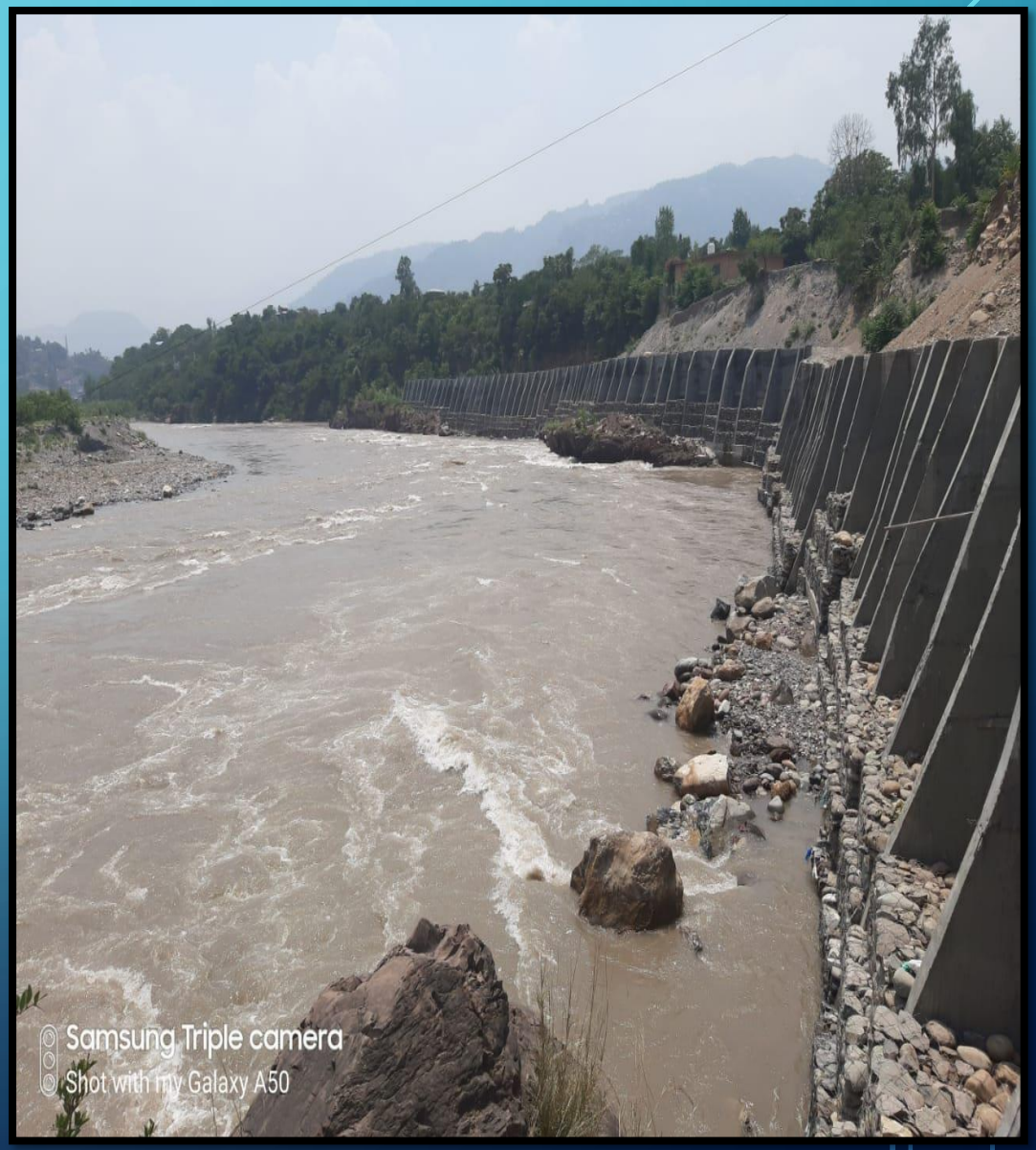
- Consequently in January 1977, Federal Flood Commission was established for integrated flood management on country-wide basis

FLOOD MANAGEMENT IN PAKISTAN

In Pakistan, both structural and non-structural measures are used to mitigate flood losses.

Principal non-structural measures include;

- ✓ flood forecasting and warning
- ✓ permanent relocation of people
- ✓ flood insurance
- ✓ land-use regulations
- ✓ flood plain mapping of some major rivers



INTEGRATED FLOOD MANAGEMENT

Construction of Flood Protection Works along major & other Rivers

i. Construction of new Flood Protection Infrastructure in vulnerable reaches along major & other rivers.

ii. Up-gradation/Remodelling of flood protection infrastructure that provides protection to the urban areas/main cities and important installations such as power stations, oil refineries, industries etc

iii. Flood Management of Hill Torrents through construction of

(a) Small Dams/Delay Action Dams (Water storage structures)

(b) Flood Management Structures for mitigating flood flows and agriculture development. Adequate budget allocation by the provinces each year for proper maintenance of existing flood management facilities

iv. Recommend options for safety inspection and real time monitoring of flood protection and River Training Works and Barrages using Satellite services of SUPARCO.

FLOOD MANAGEMENT IN PAKISTAN

- In order to safeguard the Indus Valley and other flood prone areas from inundation, embankments are constructed along major rivers and their tributaries in Pakistan.

- To protect embankment, to channelize flows through barrages and bridges, and to save lands and areas from erosion, spurs are constructed.

INTEGRATED FLOOD MANAGEMENT

FLOOD PLAIN MAPPING/ZONING

i. Flood Plain Mapping/Zoning along all the Indus river and its major tributaries (Jehlum, Chenab, Ravi & Sutlej, Kabul, Swat, Panjkora) for restricting/prohibiting by law permanent settlements in high and medium flood risk areas

i. Provinces to prepare and pass an Act/River law and ensure its implementation

i. Develop Web-GIS based inventory showing the complete history of existing flood protection and River Training Works along main rivers, secondary & Tertiary rivers including Hill Torrents/local nullahs of the entire country

ii. Submergence plans for critical reaches along flood embankments

iii. Identification, resettlement and relocation of villages in flood plains to safe areas outside the flood bunds

INTEGRATED FLOOD MANAGEMENT

- ***Provision of Escape Channels/Breaching Sections:***

- Identification of flood escape channels to desert areas/off channel storages that would provide major reduction in flood peak discharge in Indus River System. Also identify possible sites for underground reservoirs and retarding basins etc.

GIS USED AS AN TOOL FOR FLOOD MANAGEMENT

GIS and remote sensing is an important tool for detecting or identifying flood prone areas and also find out the topography of that specific area. Satellite images used for identifying the flood hazard areas in Pakistan. Through the data of GIS we can create resilient infrastructure in the flood prone areas and can save the most of destruction

DROUGHT MANAGEMENT IN PAKISTAN

INTRODUCTION

- Drought has scores of definitions however, in all contexts it originates from a deficiency of precipitation over an extended time period (usually a season or even more)
- During1998-2001 Pakistan has faced one of the worst droughts of its history due to extremely low rainfall

DROUGHT MITIGATION MEASURES IN PAKISTAN

- **INSTITUTIONAL FRAMEWORK**

Pakistan Meteorological Department (PMD)

PMD is a sole national agency which has the mandate to monitor and analyze various meteorological aspects including drought phenomenon in the country.

Emergency Relief Cell (ERC)

A small unit named ERC exists in the Cabinet Division to coordinate various relief driven activities in different affected areas of the country

Provincial Set-up

Provincial Relief Commission. (1. Drought Crisis Control Centre (DCCC) 2. Provincial Drought Management Committee (PDMC) 3. Provincial DERA unit.

TECHNOLOGICAL OPTIONS/MEASURES

- To overcome the future challenges in water sector and to lessen the impacts of drought by augmenting the existing country water resources, the available technological measures can broadly be lumped into following major categories:

1. Climatic Control
2. Macro Level Interventions;
3. Farm-Level Interventions; and
4. Crop-Based Management.

MACRO LEVEL INTERVENTIONS

- Surface-Water Storage
- Rod-Kohi Management
- Rain-Water Harvesting
- Rationale Groundwater Abstraction
- Waste Water Recycling and Desalinization
- Rehabilitation of Distribution Network

FARM LEVEL INTERVENTION

- Pressurized Irrigation Systems
- Crop-based Management
- Bed-Furrow Plantation
- Conservation Tillage

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Thanks

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