Early Warning & DRM System of Pakistan – Learning from Good Practices

South Asia Hyderomet Forum

By

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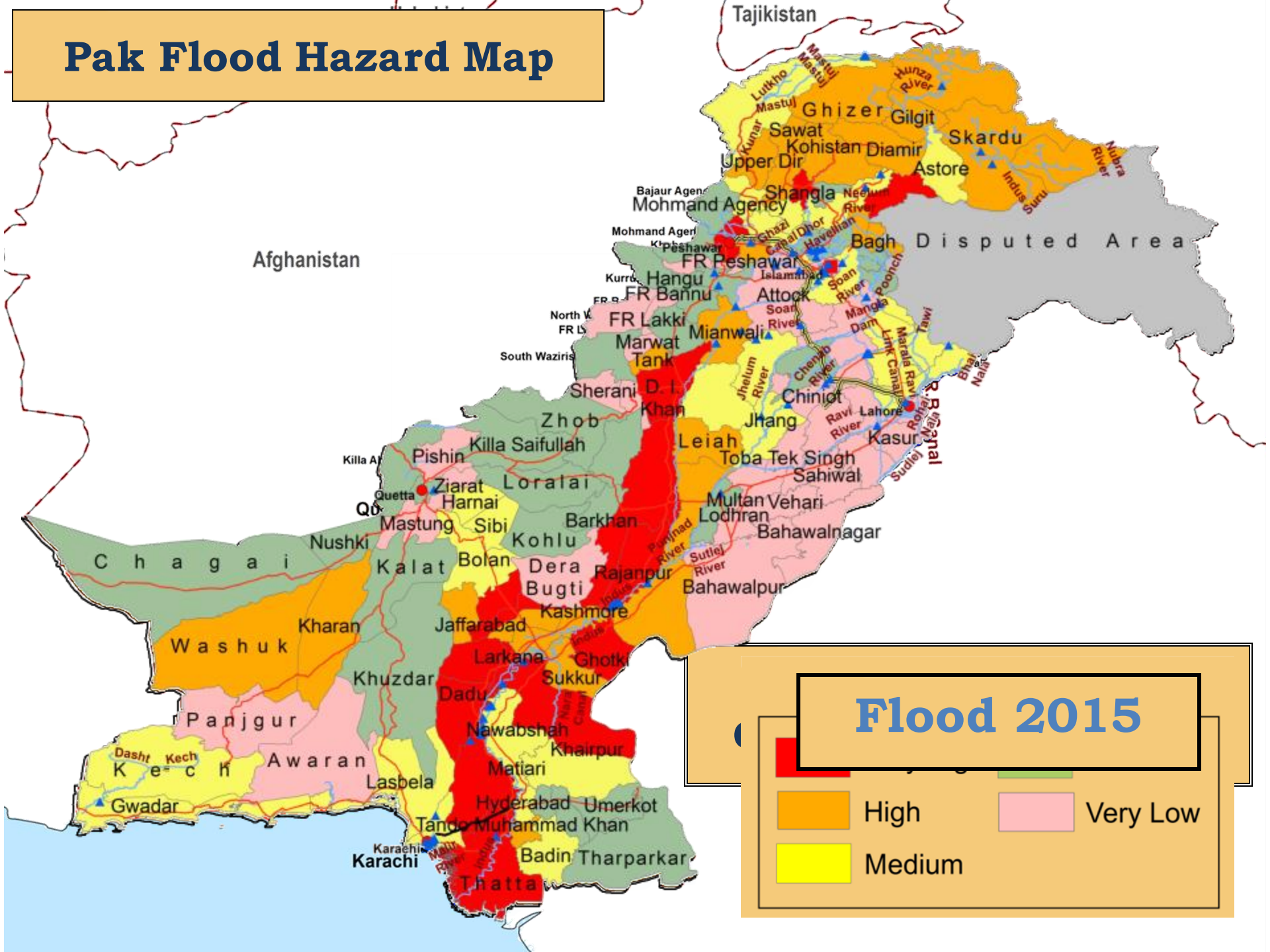
Sequence

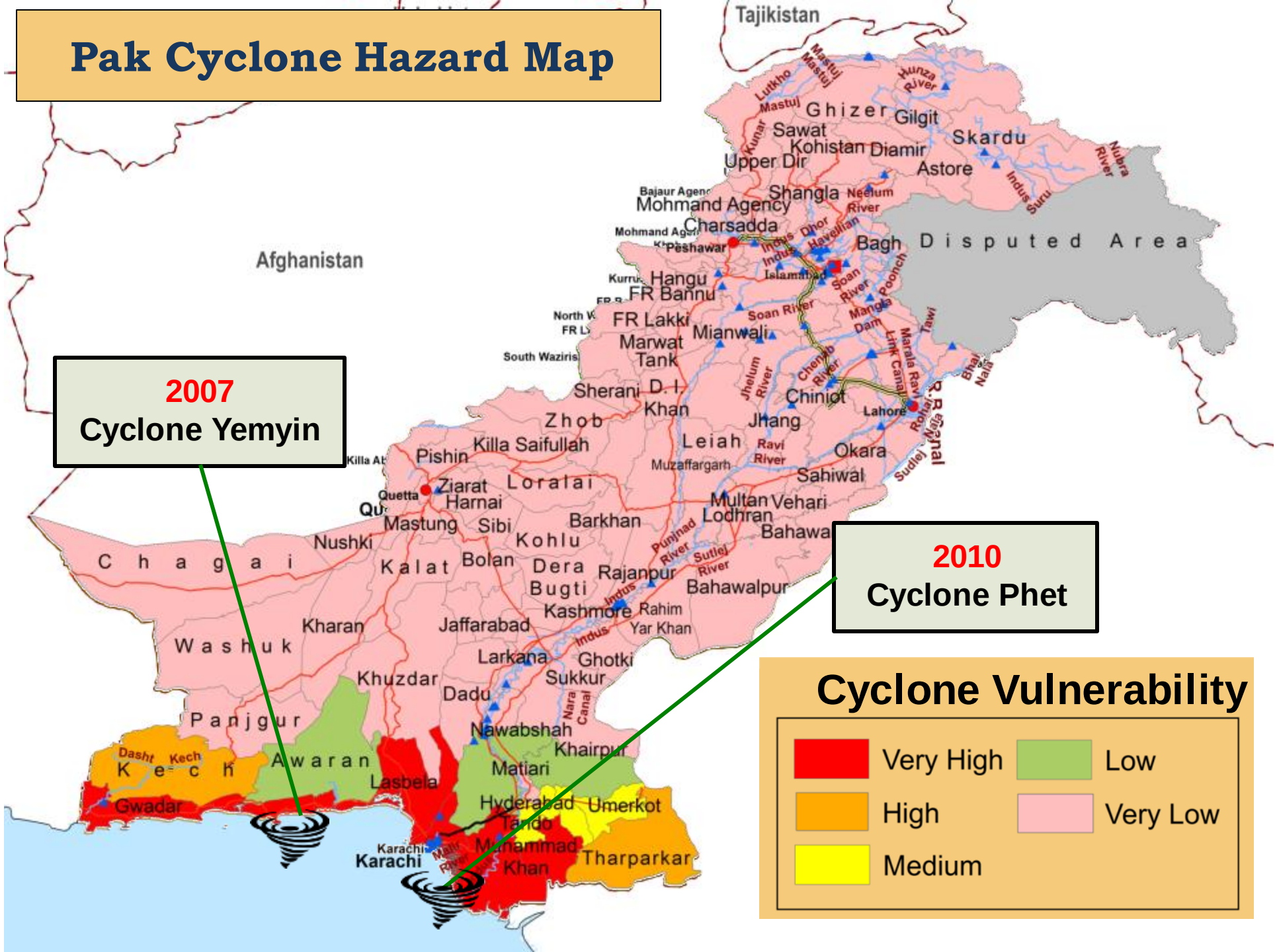
- Hazard Profile and Disaster Management System in Pakistan
- Early Warning Systems and Linkages with DM System
- Good Practices & Focus on DRR
- Challenges & Priority Areas

Hazard Profile of Pakistan

Pak Flood Hazard Map



Pak Cyclone Hazard Map



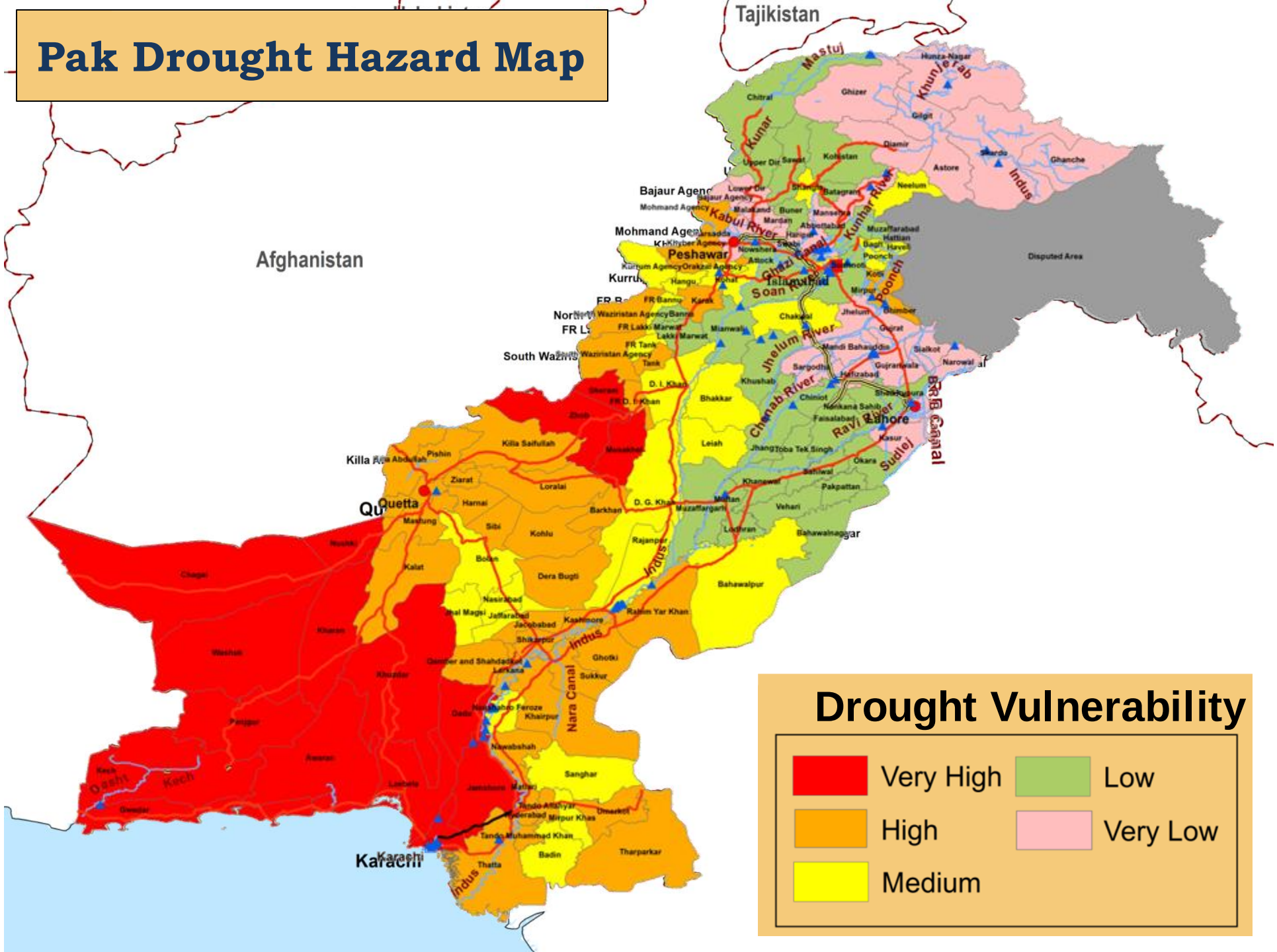
2007
Cyclone Yemyin

2010
Cyclone Phet

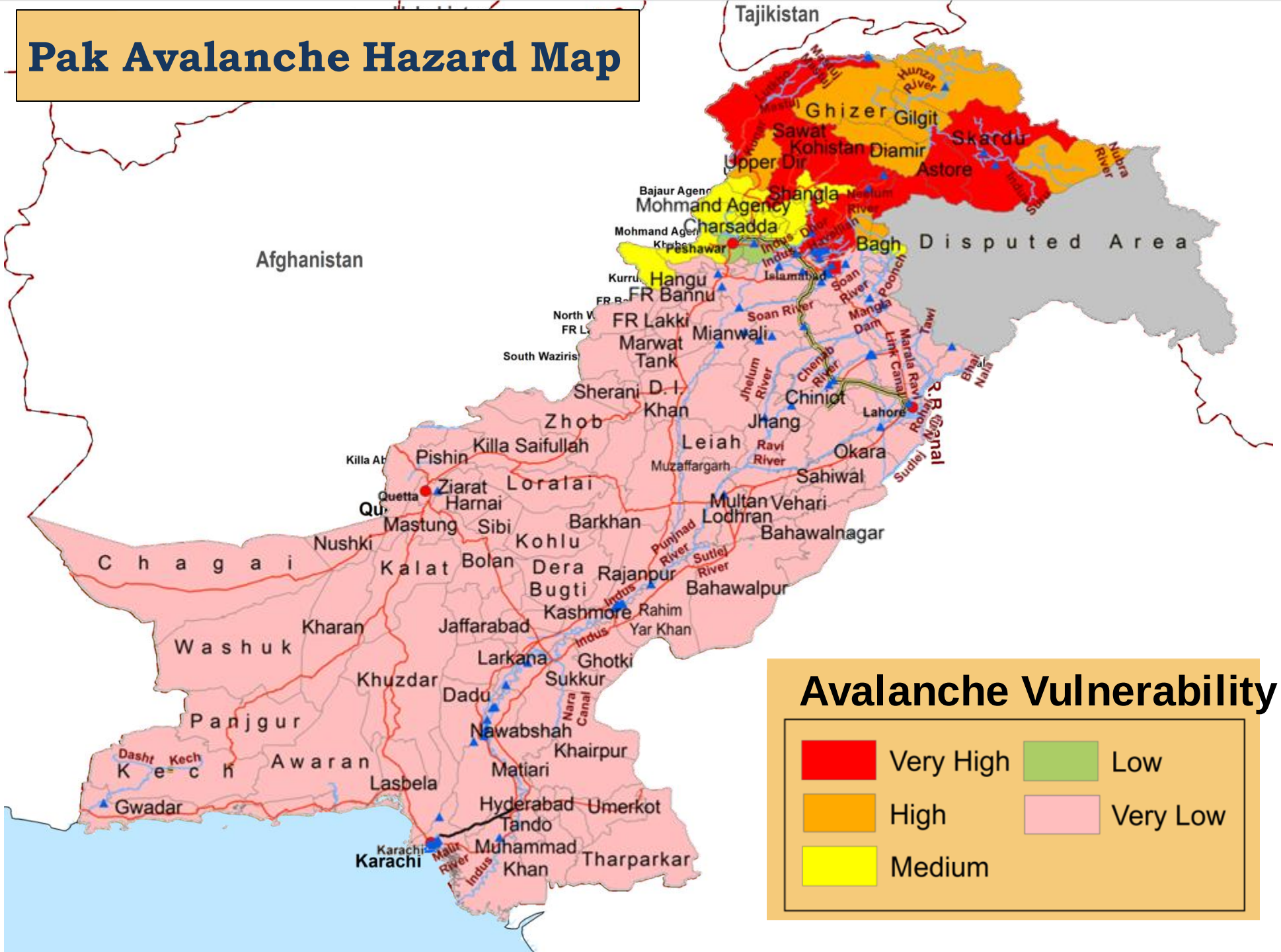
Cyclone Vulnerability

- Very High
- High
- Medium
- Low
- Very Low

Pak Drought Hazard Map



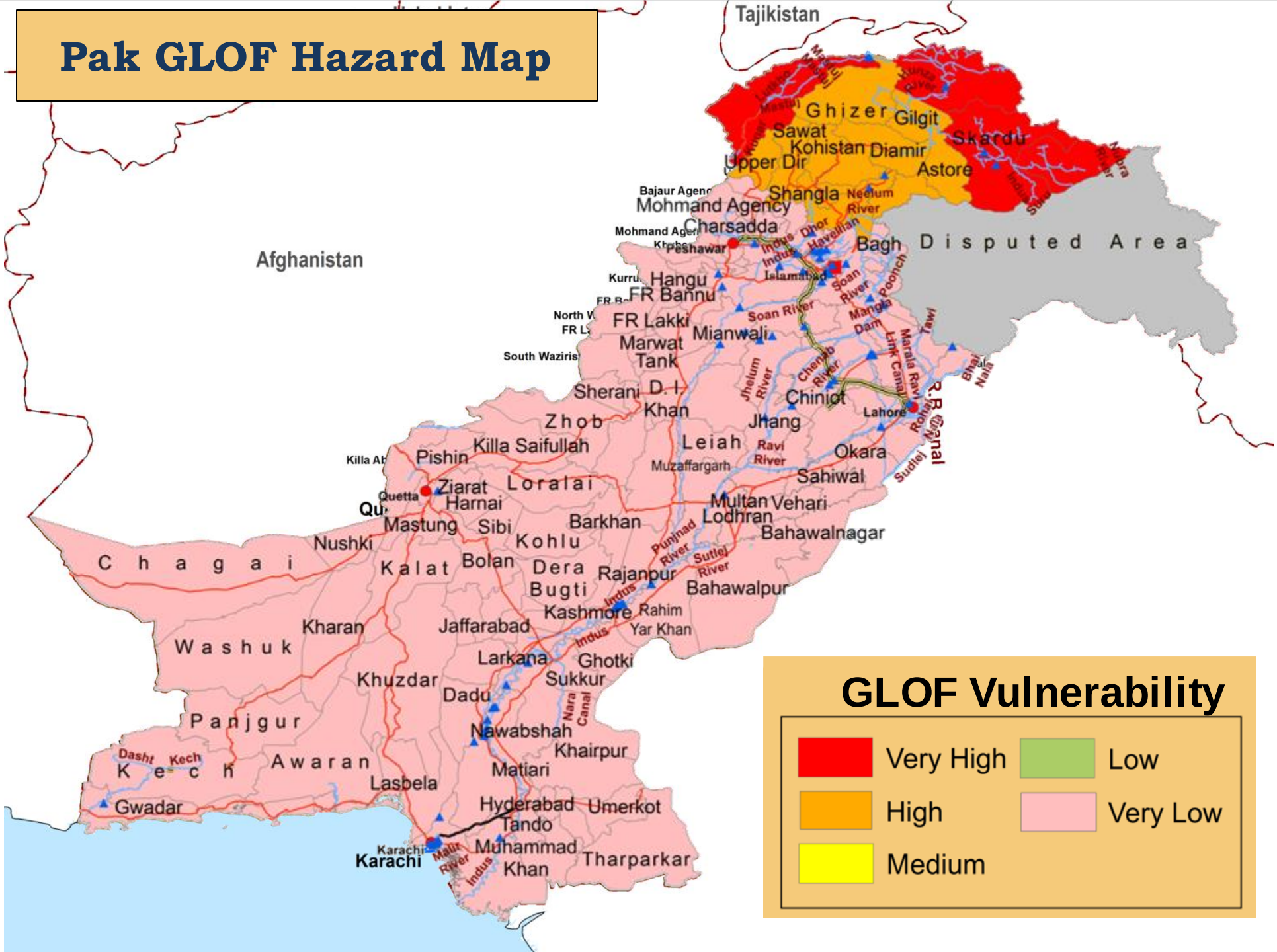
Pak Avalanche Hazard Map



Avalanche Vulnerability

- Very High
- High
- Medium
- Low
- Very Low

Pak GLOF Hazard Map



GLOF Vulnerability

- Very High
- High
- Medium
- Low
- Very Low

Global Climate Risk Index

Long Term Climate Rate Index

CRI (97-2016)	Country	CRI Score	Deaths	Deaths per 100,000 pers	Total Losses (USD Millions)	Losses per GDP Unit %	Number of Events during Period
1	Honduras	12.17	301.65	4.28	961.11	1.968	62
2	Haiti	13.50	280.40	2.96	418.77	2.730	72
3	Myanmar	14.00	7,097.75	14.55	1,277.86	0.694	43
4	Nicaragua	19.33	162.45	2.96	234.60	1.127	44
5	Philippines	20.17	859.55	0.98	2,893.41	0.611	289
6	Bangladesh	26.50	641.55	0.44	2,311.07	0.678	187
7	**Pakistan**	**30.50**	**523.10**	**0.33**	**3,816.52**	**0.605**	**141**
8	Vietnam	31.83	312.60	0.37	2,029.80	0.549	216
9	Thailand	33.83	139.60	0.21	7,696.59	0.967	137
10	Dominican Republic	34.00	210.90	2.32	243.53	0.262	49

Source: German Watch

Effects of Climate Change on Pakistan

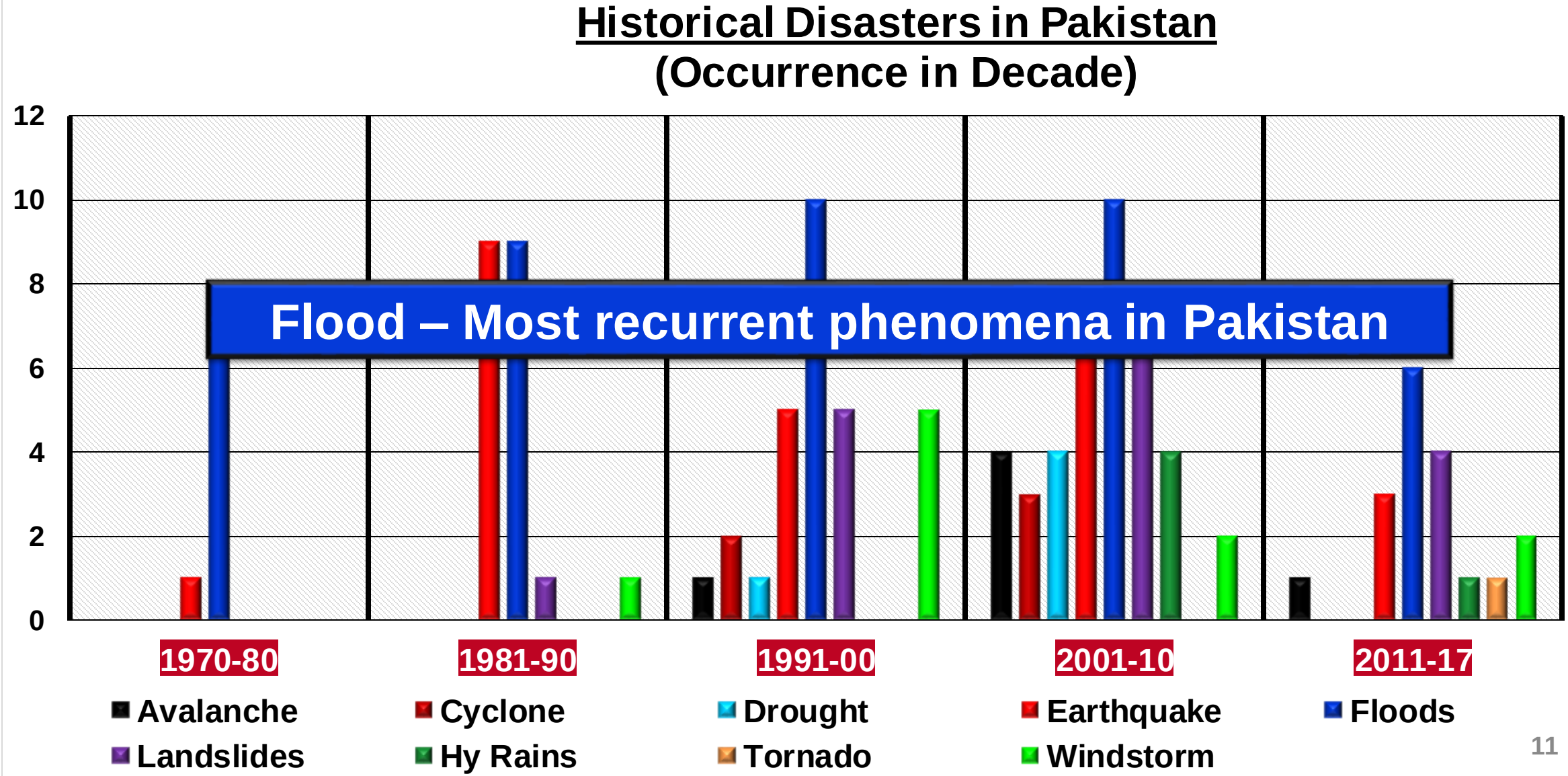
Increased Temperatures 2016 - 2035 (IPCC AR5)

Global versus Pakistan
Decadal Mean Temperature Trends

Period	Global	Pakistan
1901-2000	0.06 °C	0.06°C
1956-2005	0.12 °C	0.16°C
1971-2005	0.15 °C	0.26°C
1981-2005	0.17 °C	0.39°C
1991-2005	0.33 °C	0.74°C
2010-2039	0.7°C*	1°C

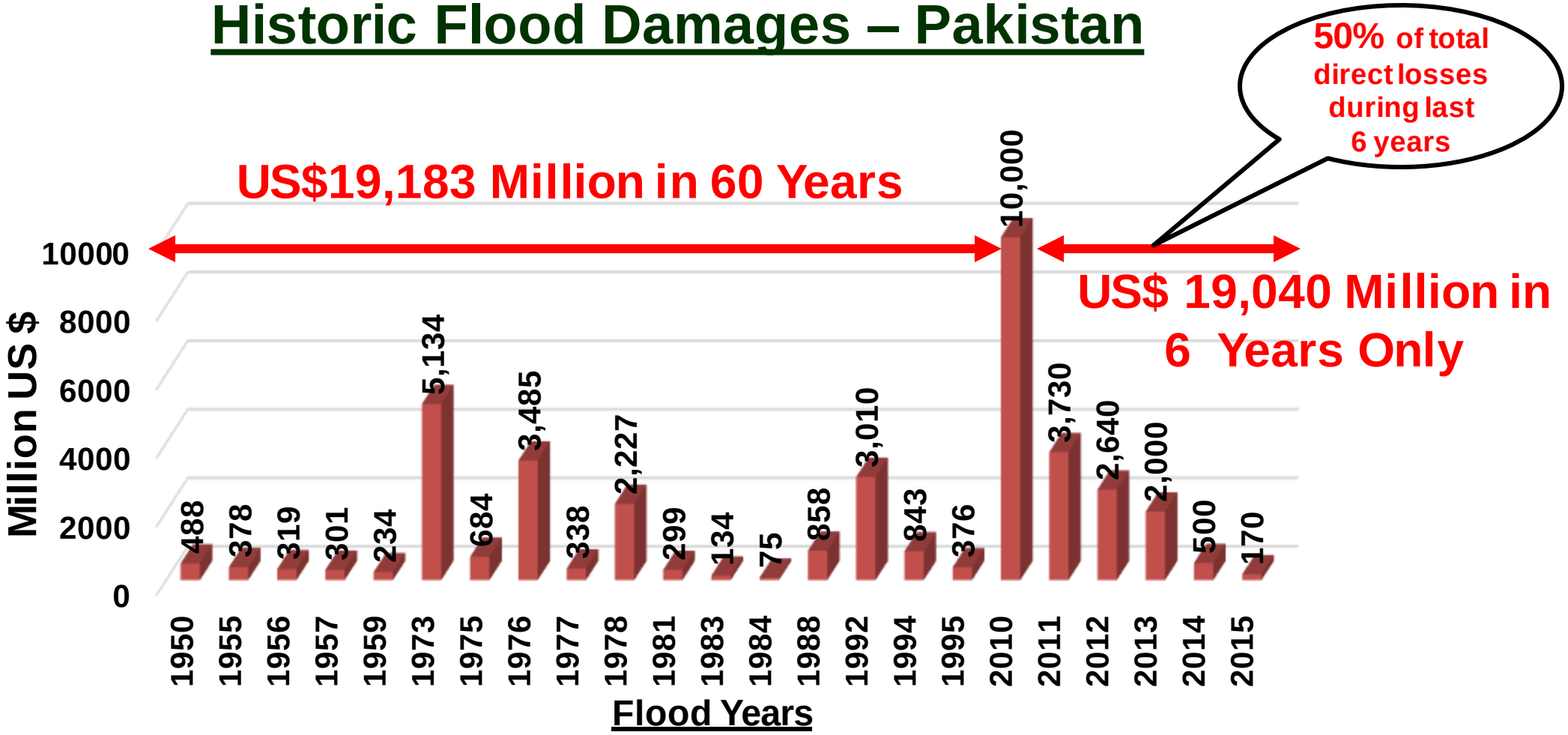
The mean temperature rise after 1950s over Pakistan is twice as fast as the Global Mean Change

Effects of Climate Change on Pakistan



Effects of Climate Change on Pakistan

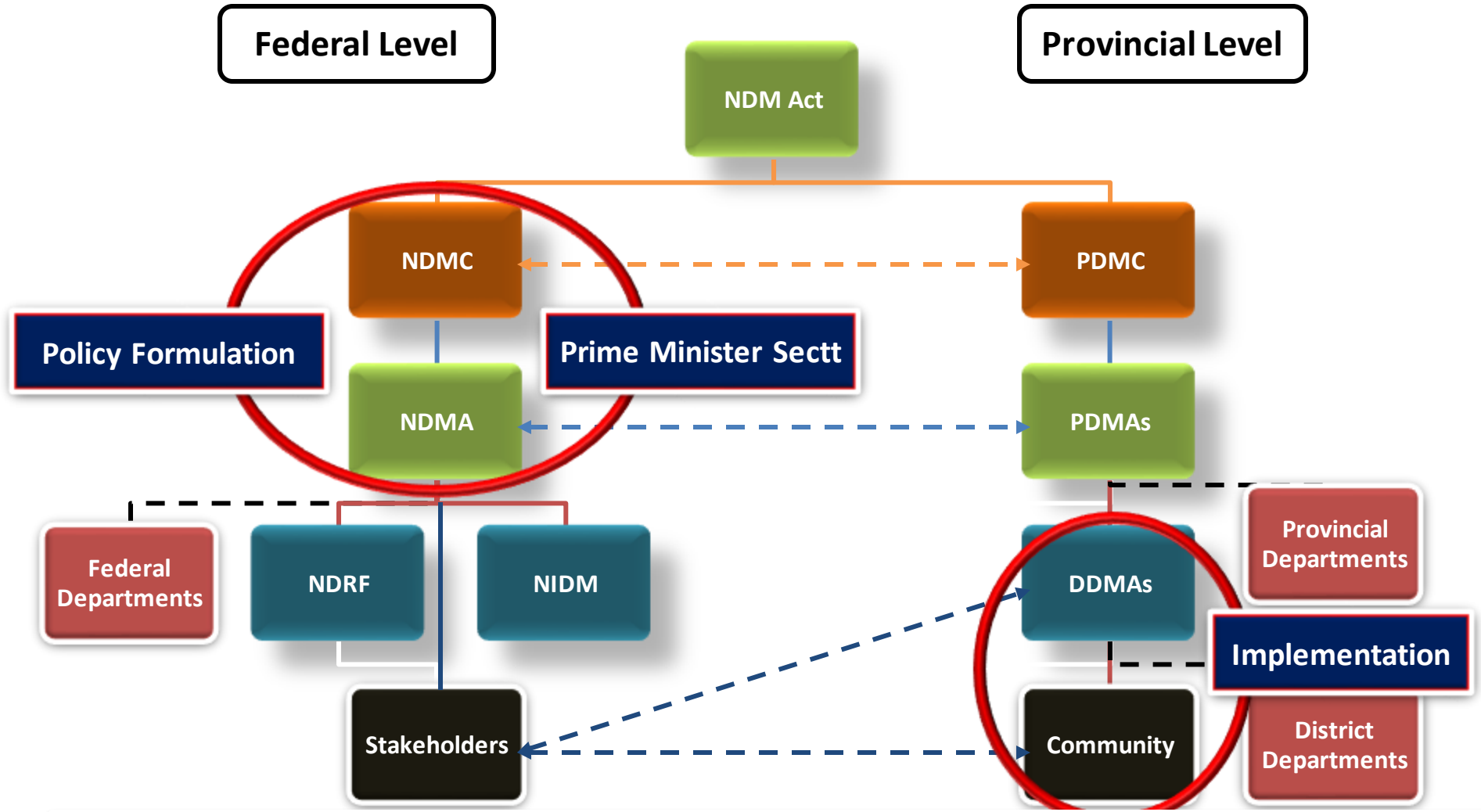
Historic Flood Damages – Pakistan



Total Direct Losses US$ 38,223 Million

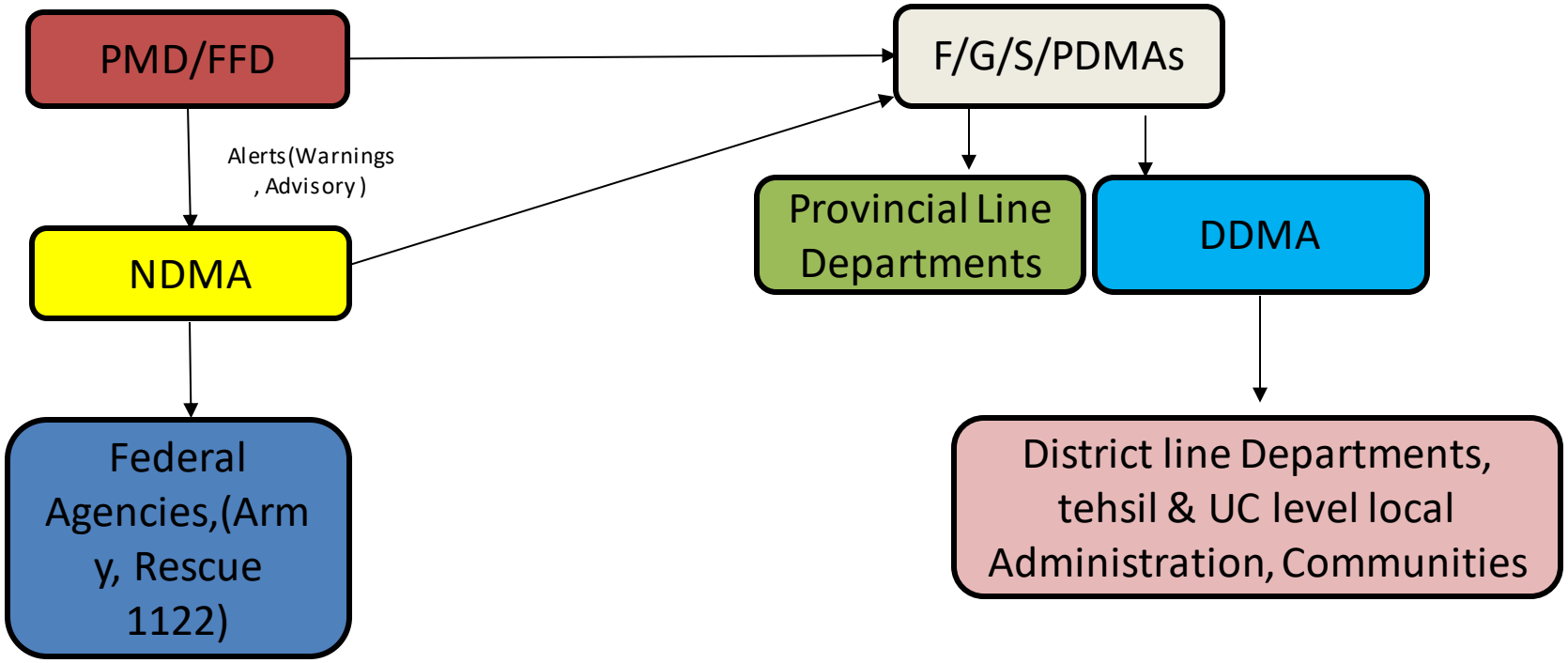
DRM System & Early Warning Mechanism

Disaster Management Structure as per NDM Act



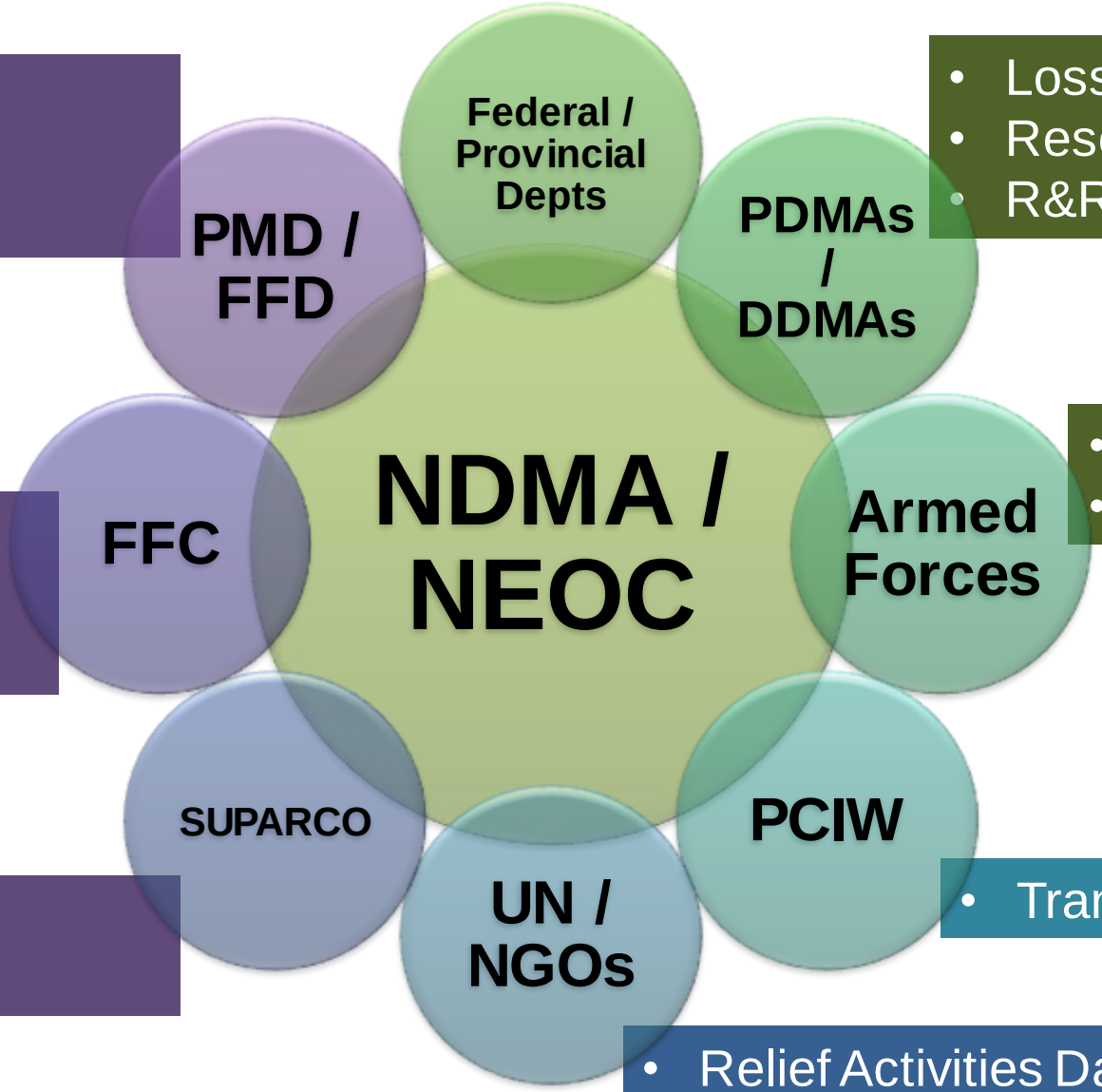
Disaster Management is a Devolved Subject

Early Warning Dissemination



Sharing of Information

- Weather Forecasting
- Flood Forecasting
- Seismology



- Losses / Damages Data
- Rescue / Relief Data
- R&R Efforts

- Losses / Damages Data
- Rescue & Relief Activities

- River Flow Data
- Canal Flow Data
- Dams Data

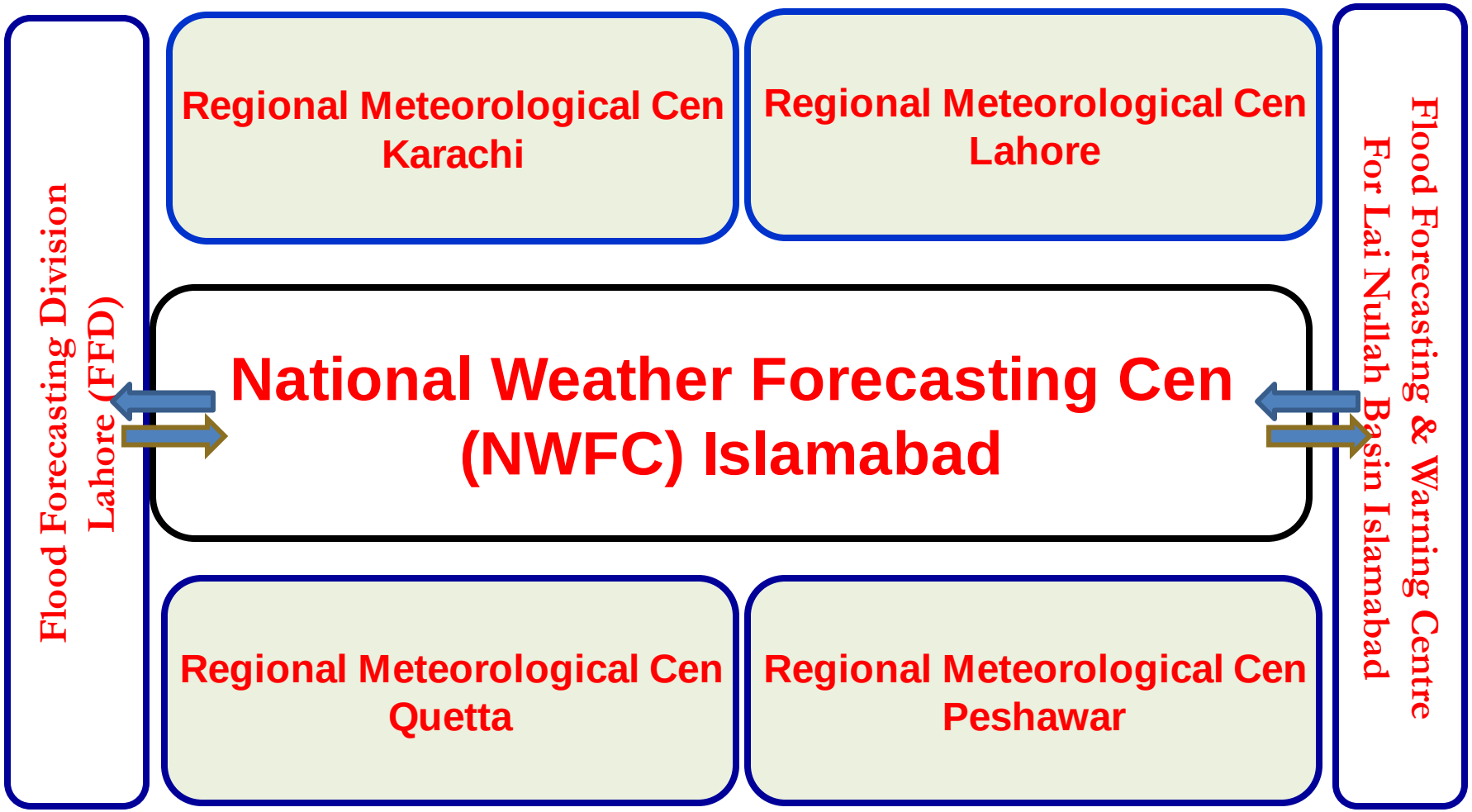
- Transboundary Water Flow Data

- Satellite Imagery
- Imagery Analysis

- Relief Activities Data

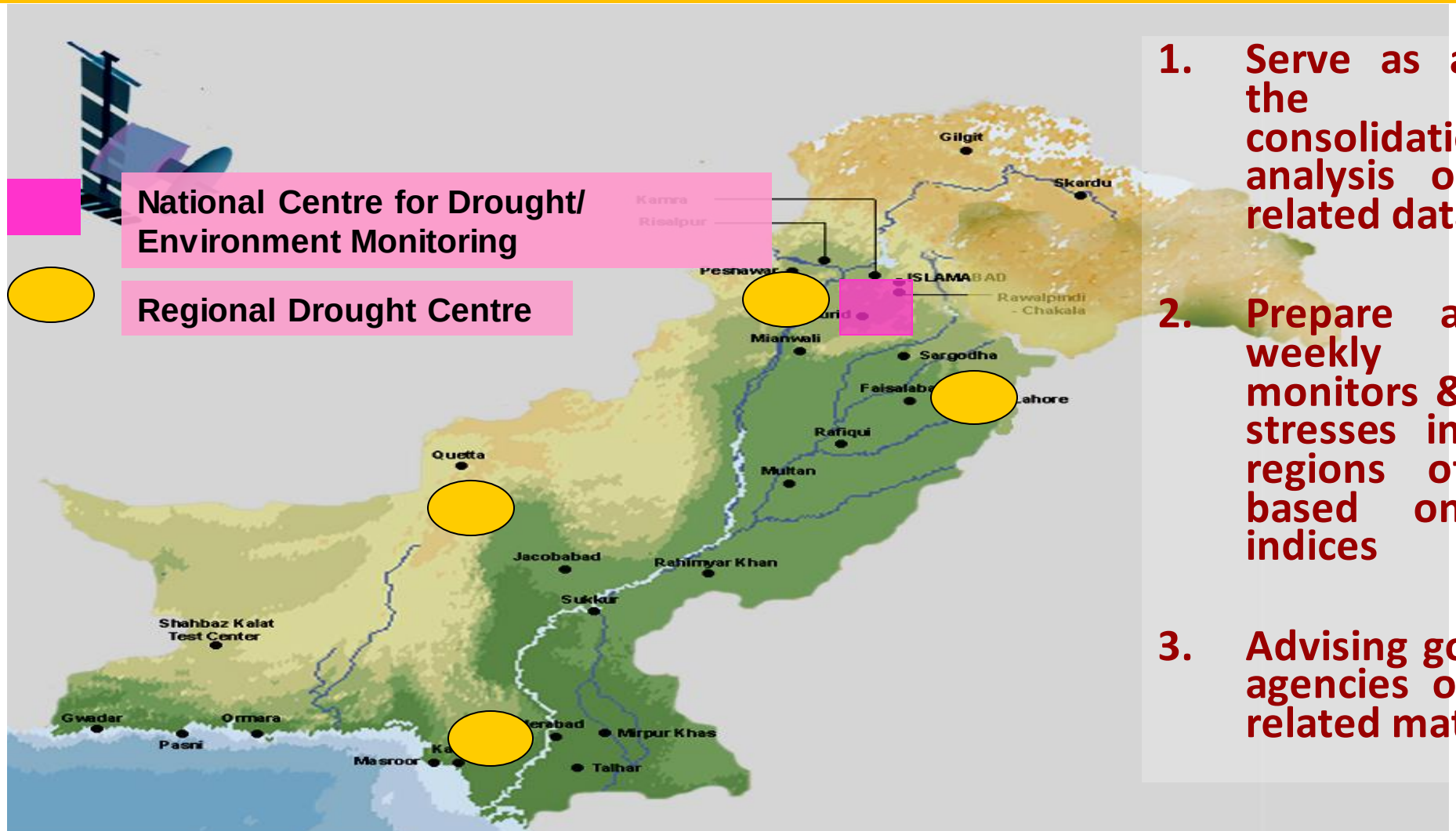
Early Warning Dissemination

Weather Forecasting Network of PMD



Early Warning Dissemination

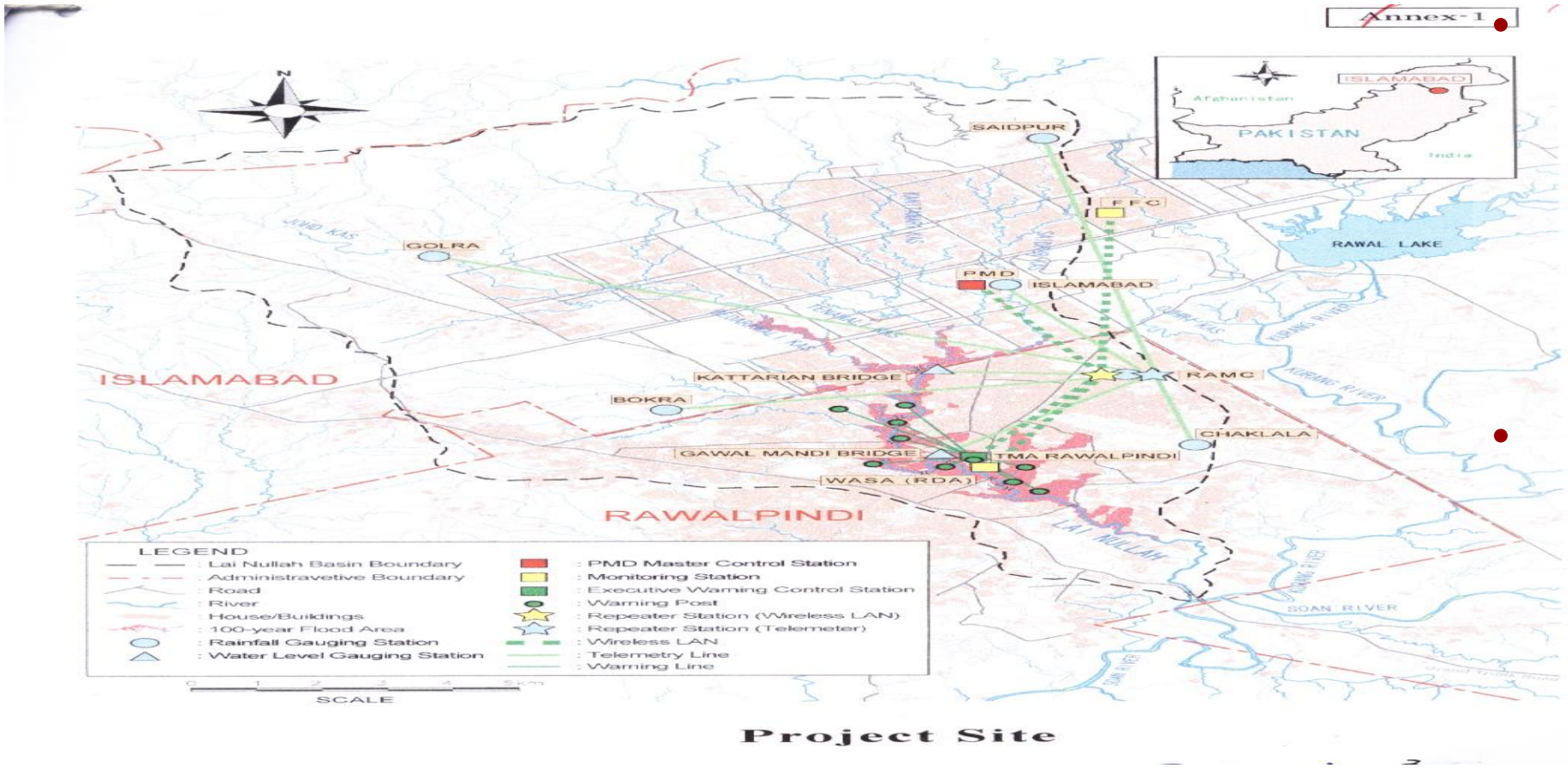
Drought/Environment Monitoring & Early Warning Centre



1. Serve as a hub for the collection, consolidation and analysis of drought related data
2. Prepare and issue weekly drought monitors & moisture stresses in different regions of country based on various indices
3. Advising government agencies on drought related matters.

Good Practice of EW System

Flood Forecasting and Early Warning System (FFWS)



Project Site

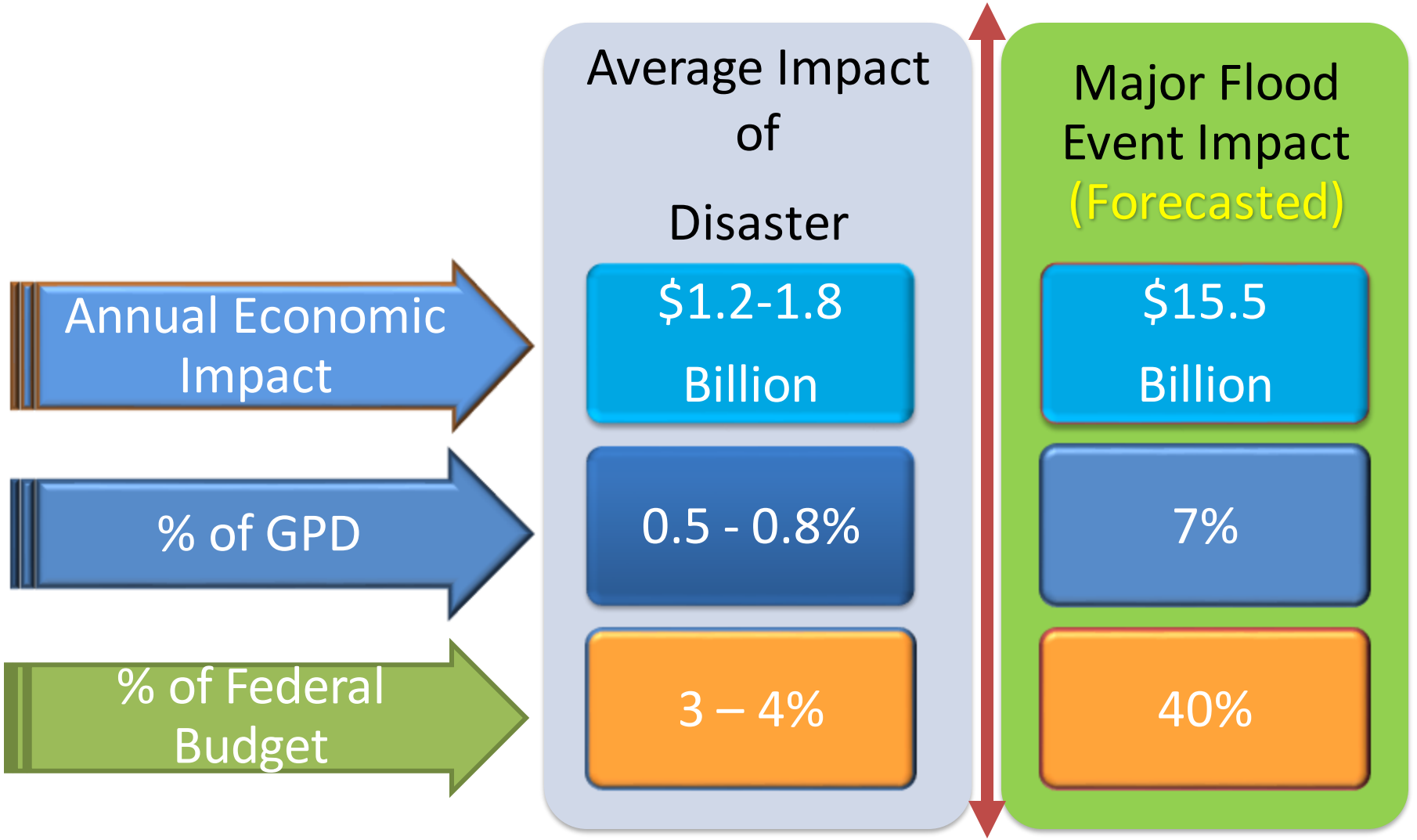
- Providing Accurate Forecasting & Early Warning with Flood Forecast lead time of one to two hours.
- Public Warning System for the twin cities

Futuristic Early Warning System

- Early Warning System is integral part of National DRM planning.
- Replication of Urban Flood Forecasting and Early Warning System
- Satellite based Integrated Flood Alert System for flash floods
- Early Warning based insurance mechanisms.
- Pakistan Resilience Partnership (PRP) for involving stakeholders including private / corporate sector in DRM
- Tap on the opportunities for Trans boundary Early Warning Mechanisms

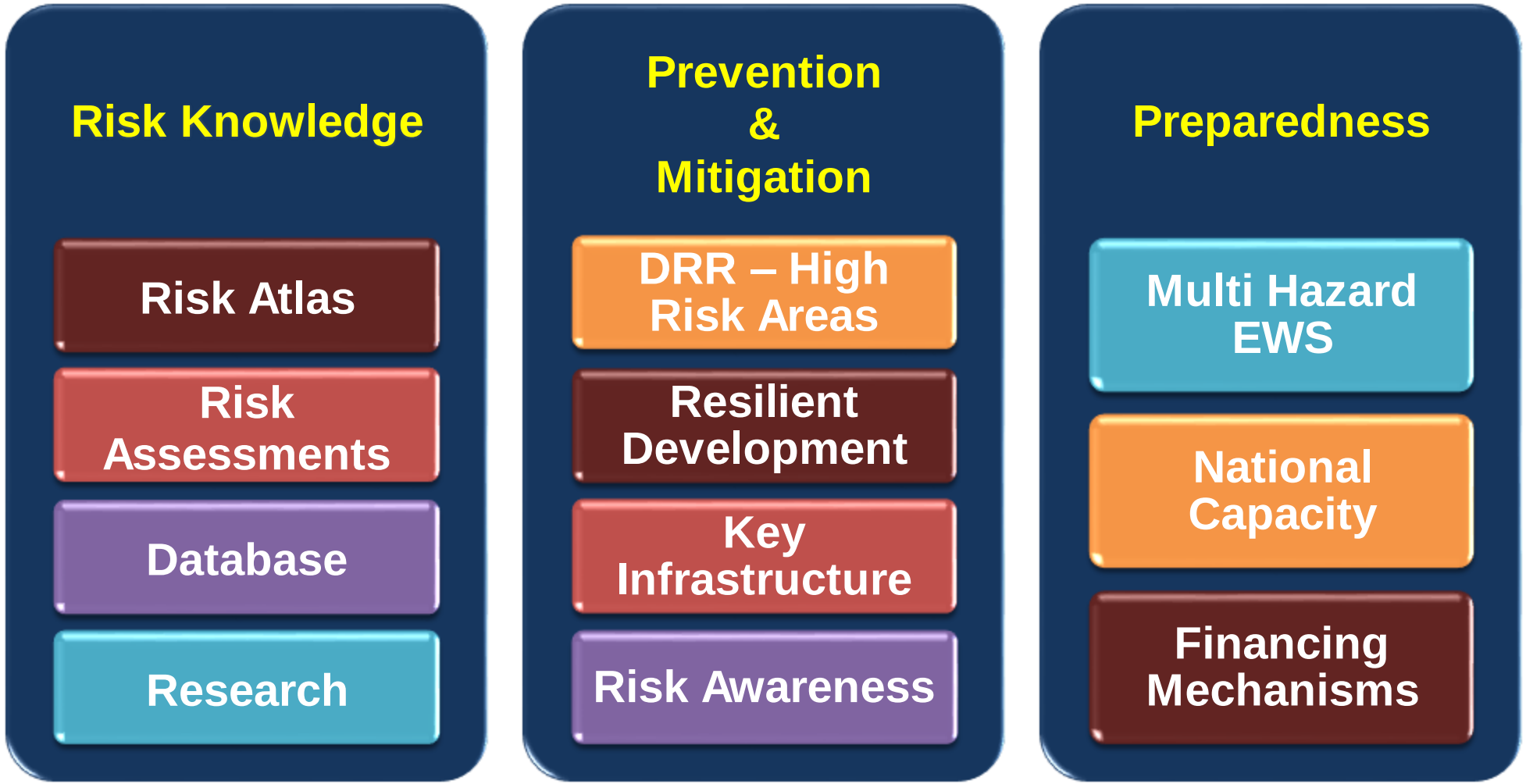
Focus on DRR

Economic Impact of Major Disasters Since 2005



Source: *Fiscal Risk Assessment Options for Consideration, A Study by World Bank and GFDRR, 2015*

National DRR Policy 2013



National Disaster Management Plan (NDMP)

NDMP – 2013 to 2022

Interventions	:	10
Strategies	:	41
Projects	:	118
Revised Cost	:	USD 2040.90 M
Timeframe	:	10 Years (2013-22)

NDMP – Financial Outlay

Intervention	Cost US$ M*	Responsible Organization
Establish Institutional & Legal System for Disaster Management	2.30	NDMA, PDMAs
Prepare Disaster Management Plans - All levels	3.00	NDMA, PDMAs
National Hazard & Vulnerability Assessment	24.00	NDMA, PDMAs, GSP, ERRA, GCISC, FFC, PMD, WAPDA
Establish Multi-Hazard Early Warning and Evacuation Systems	**188.50**	PMD, FFC, SUPARCO, Provincial Irrigation Department
Promotion of Training, Education & Awareness in relation to Disaster Management	64.30	NIDM/NDMA, Civil Defense, Provincial Education Departments
Disaster Management Awareness	14.00	NDMA, PDMAs, DDMAs
Infrastructure Development for DRR	**1707.60**	FFC, PID, Ministry of Ports & Shipping
Mainstreaming DRR into Development	1.20	Ministry of Planning, Development and Reforms, NDMA, PDMAs
Establish National Emergency Response System	31.00	NDMA, PDMAs, DDMAs, M/O IT, M/O Information
Capacity Development - Post Disaster Recovery	5.00	NDMA, PDMAs
Total	**2040.90**	

CHALLENGES & PRIORITY AREAS

Challenges for Disaster Management

Limited Capability of Meteorological Department

- **Prediction of medium to long range forecasting – 7 to15 days**
- **Lacks in Quantitative Forecast of Extreme Events (2010 & 2014 floods)**
- **Accuracy in Seasonal Weather Prediction 50 – 60%**
- **No Upper Atmosphere Weather Data for Storm Tracking**
- **No Urban Flood Forecasting System except for Islamabad – Rawalpindi**

Challenges for the Disaster Management

- **Overlapping legal and institutional structures**
- **Vulnerability** against floods till implementation of NFPP – IV
- Trans boundary Sharing of information
- Disaster Information Management System
- DM System at District Level needs further strengthening
- **Micro level vulnerability Risk assessment needs to be completed at the earliest** for streamlining land use planning, future developments, need assessment , allocation of resources etc.

Challenges for the Disaster Management

- **Mainstreaming DRR into Development Planning and implementation**
- **Building codes implementation**
- **Retrofitting** of existing infrastructure for DRR compliance

NDMA PRIORITIES

NDMA's Priorities

- Legal and institutional Reforms
- **Multi- Hazard Vulnerability Risk Assessments at Micro Level (UC level)**
- Enhance resilience capacity of communities through CBDRM, advocacy and awareness.
- Enhance early warning capacities for multi hazards
- Develop Disaster Management information System
- Capacity Building of the Government Officials
- Enhance Response and logistic capacities
- Focus on Gender Equality and Vulnerable Groups

NDMA's Priorities

- **Smart National Disaster Response Force (NDRF)**
- **Pakistan School Safety Framework**
- **Building Codes implementation**
- DRM Services and Weather forecasting project with the support of World Bank – A major investment initiative
- National Disaster Risk Management Fund – a permanent investment window for DRR and Preparedness
- Risk Financing Mechanisms including Macro & Micro level risk insurance mechanisms

Thank you