



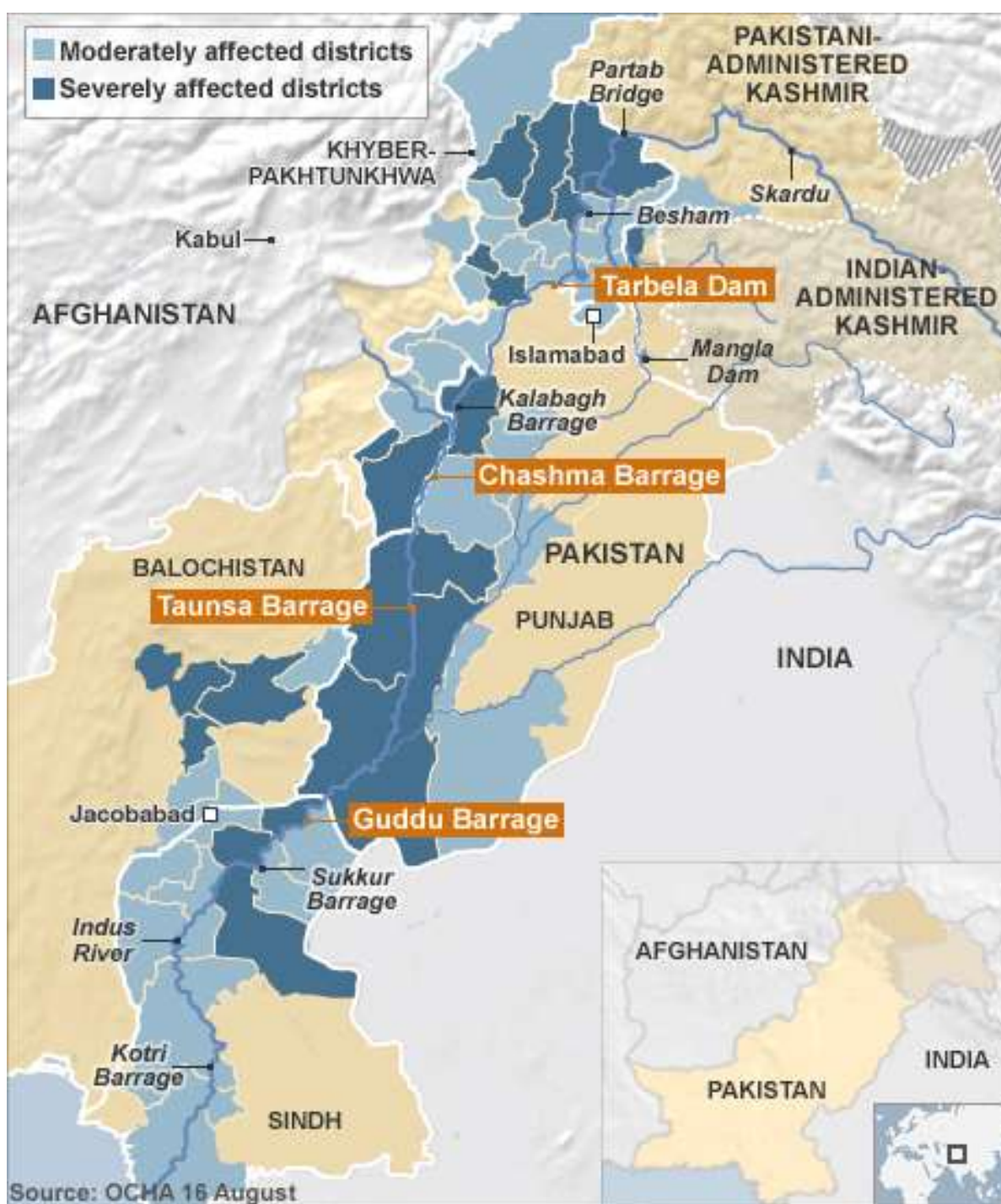
Putting Nature to Work: Integrating Green & Gray Infrastructure

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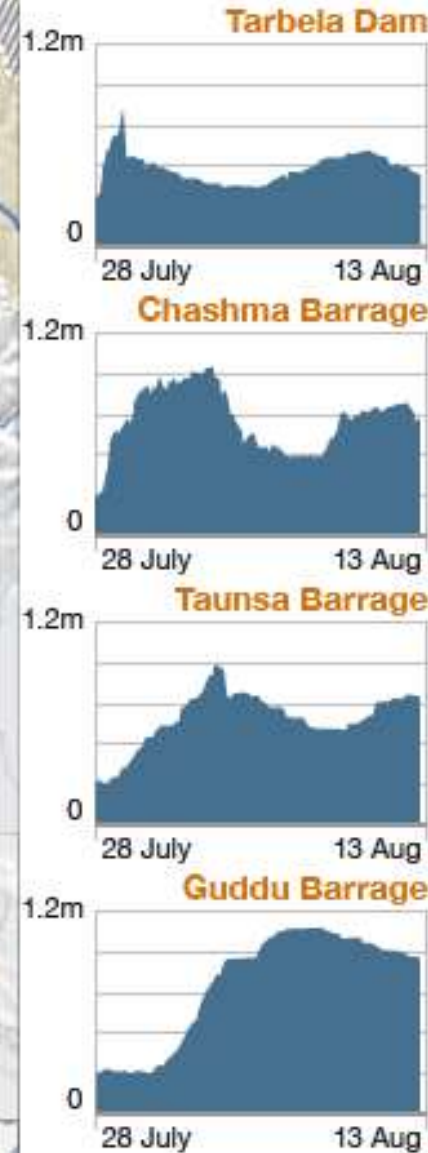


2010 Super Flood



Track of flood wave along Indus River

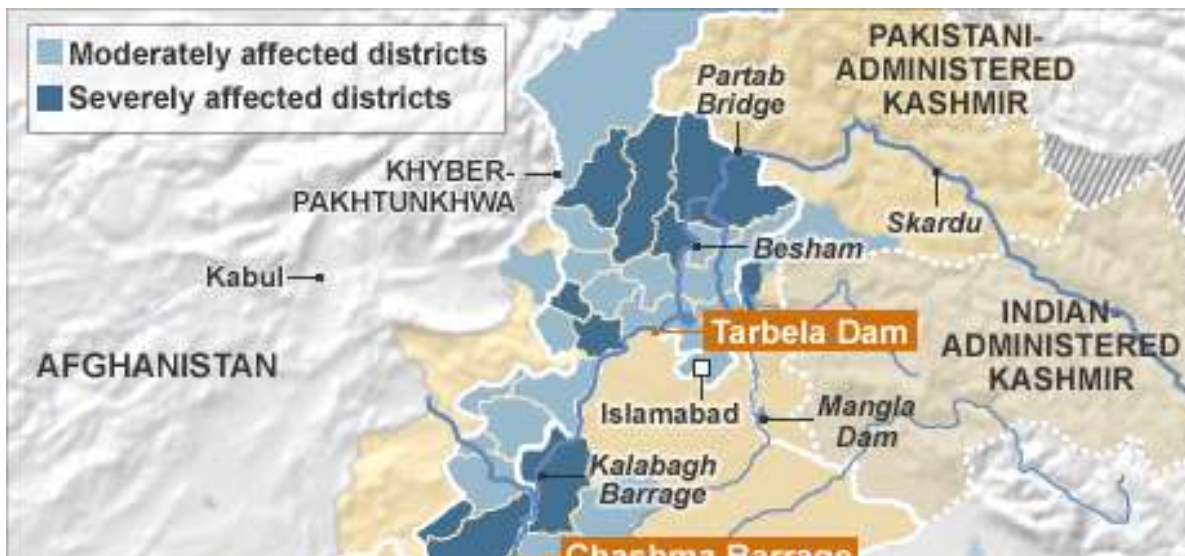
Cubic feet per second (Cusecs)



Source: Pakistan Meteorological Department



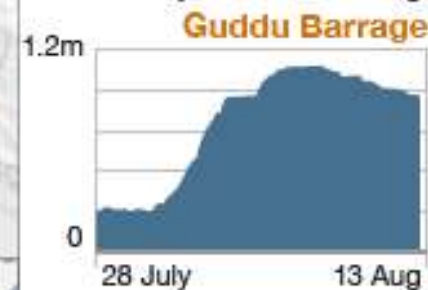
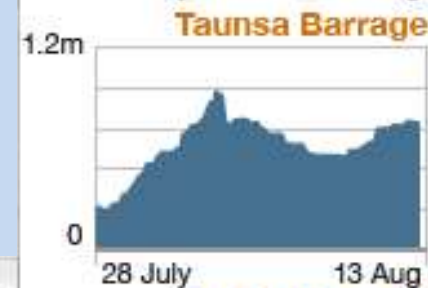
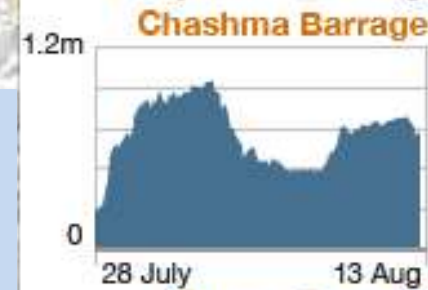
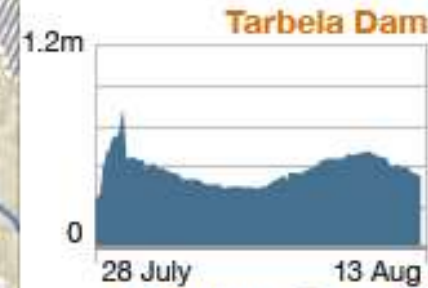
2010 Super Flood



- 20 million people affected, 1/5th of the country was under flood
- Losses: > 2,000 people; > 1.9 million homes, 4 million ha agri land
- Estimated loss of 2010 floods was equal to the estimated loss of all floods
- First time, the need was felt to manage flood risks, store extra floodwater and harness hill torrents

Track of flood wave along Indus River

Cubic feet per second (Cusecs)



Source: Pakistan Meteorological Department



RAM Recommendations

- ❑ **Legislations and enabling environment** need to be in place
- ❑ **Holistic Indus River Basin Approach** and dialogue
- ❑ **Wetlands Management Authority** needs to be established
- ❑ Include the issue of maintaining “**Environmental flows**”
- ❑ Shift from **hard engineering to soft engineering** solutions
- ❑ **Documentation of traditional knowledge** on flood management to see if those techniques are still employed
- ❑ **Restoration of flooded forests and floodplains** along the Indus River for flood management
- ❑ **Economic valuation of floodplains** and introduction of **alternative livelihoods** for vulnerable communities
- ❑ Identification of **potential sites** along the Indus River
- ❑ **Exposure Visit** of Pakistani Delegation to **China** in **2016**



Connecting Yangtze with Lakes



Diversified Portfolio Approach – Integrating Ecosystem-Based Adaptation with Government Irrigation Department’s Infrastructure Solutions

Potential Interventions:

Site A: Hill-torrent and watershed management interventions in Kirthar Mountains:

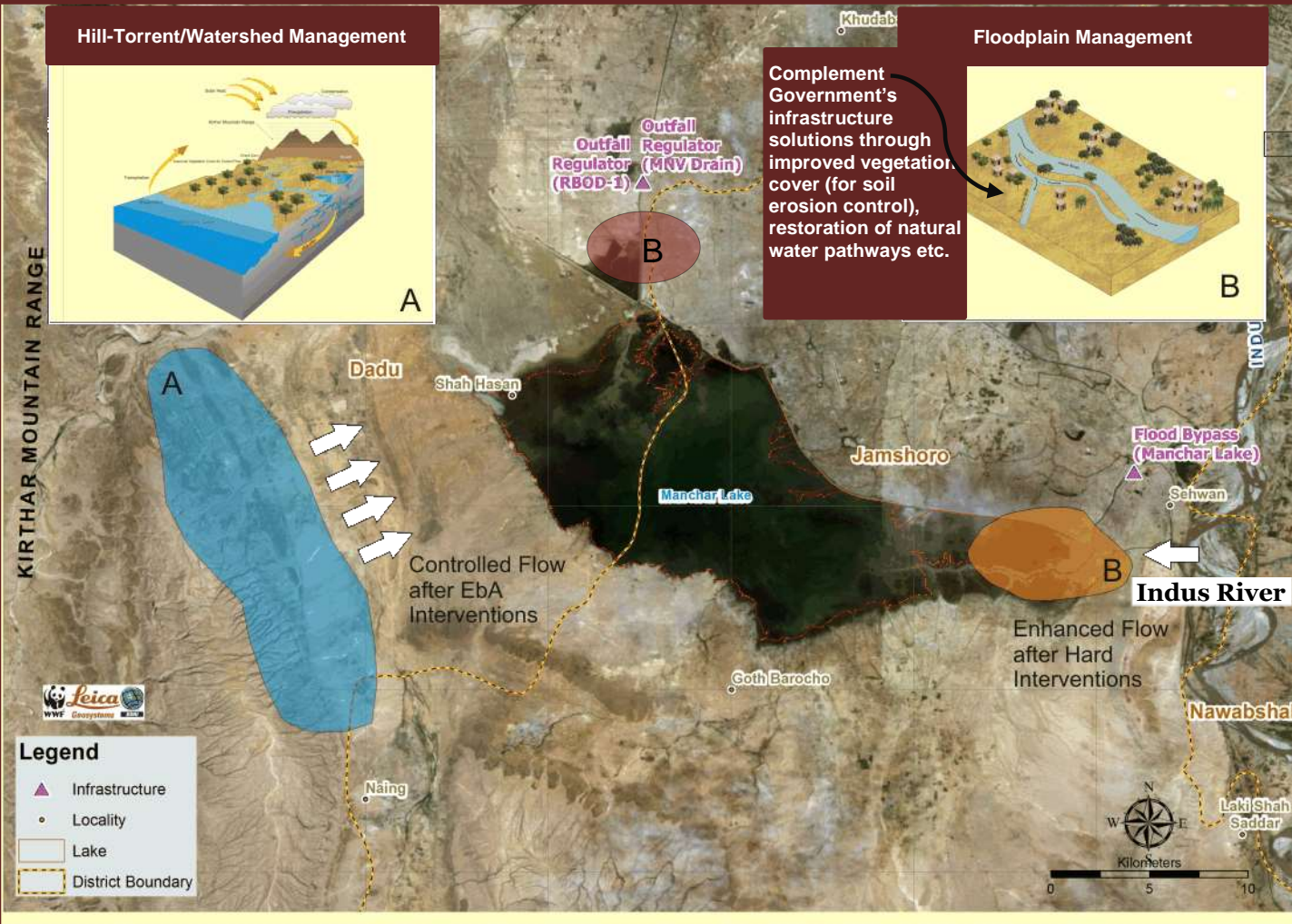
Alleviate flash flood risks on communities, while maintaining flows to Manchar Lake; watershed management, e.g. check dams, terracing, and afforestation; flash flood dispersion for spate irrigation; diversion, soil bio-engineering.

Site B: Floodplain management to manage flood flow from Indus River on eastern end of Manchar Lake:

Identify naturally inundated and undeveloped areas to be maintained as floodways/ washlands/ bypass channels, restore floodways and bypass channels through removal of blockages, re-linking with main river channels, and flood tolerant plantations etc; riverine afforestation; and erosion control.

Potential Benefits:

1. *Environmental benefits* (e.g. net volume of water in lake increased and quality improved, improved hydrological flows around Manchar Lake, ecosystem services improved)
2. *Social benefits* (e.g. reduced flood risk to lives and assets, local and provincial institutions strengthened, local knowledge and capacity built keeping in view gender sensitivity)
3. *Economic benefits* (e.g. reduced flood damages and costs avoided, green/grey infrastructure made more resilient to flooding, livelihoods sustained through improved aquaculture and agriculture development in and near Manchar Lake site)





Project Facts

Project Title: RECHARGE PAKISTAN: Building Pakistan's Resilience to Climate Change through Ecosystem-Based Adaptation for Integrated Flood Risk Management

Duration: Phased Approach: Phase 1 is proposed for 2020 - 2030

Budget: USD 150 Million (USD 50 million from GCF and at least 2/3rd co-financing)

Project Focus: Ecosystem-based Adaptation (floodplain management, wetlands restoration, hill torrents and catchments management) for reducing flood risks and enhancing groundwater recharge

Beneficiaries: 10 Million Direct Beneficiaries in 47 Tehsils; 30 Million Indirect Beneficiaries, >25 districts along Indus River

Policy Alignment: National Climate Change Policy & Implementation Framework, National Water Policy, INDCs, National Flood Protection Plan-IV, SDGs, Sendai Framework, Ramsar Convention, and others



Project Outline

Vision: By 2050, ecosystem-based adaptation contributes towards better climate resilience, water and food security, and sustainable livelihoods in Pakistan

Impact: By 2030, flood risk reduced and water recharge enhanced at 6 sites in the Indus Basin, building resilience of 10 million people and vulnerable ecosystems

Components:

1. Ecosystem-based Adaptation for Integrated Flood Risk Management
2. Enhancing Resilience of Vulnerable Communities to Climate Change
3. Enabling a paradigm shift towards Ecosystem-based Adaptation in Pakistan



Thank You

