

**MANAGEMENT OF FLOOD 2010:
LESSONS LEARNT AND IMPROVEMENT STRATEGIES**

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THE EVENT

Key Features of Flood 2010

- Unprecedented Super Flood.
- Extremely Long Duration of Peaks.
- Two Peaks Over a Two Week Period.
- Continuous Rainfall and Hill Torrents Flooding.
- Flood Received After a Very Long Dry Spell.

Sequence of Events:

- Torrential rains in the catchment areas of Swat, Kabul and Indus River during last week of July and First fortnight of August.
- Exceptionally High Flood hit Kalabagh Barrage on 30-7-2010. Left Guide Bund (LGB) breached on 29-7-2010. Breaching section activated on 30-7-2010 to save the barrage.
- Flood Peak reached Taunsa barrage on 02-08-2010. Spur 5 came under direct attack of the flood waters and saved by hectic efforts.
- Left Marginal Bund (LMB) however could not sustain the pressure of exceptionally high flood and breached on 02-08-2010.
- The breach in LMB was the main cause of the extensive damages and inundations in Muzaffargarh District via TP link / Muzaffargarh canal.
- The super flood, after crossing Taunsa, engaged the protection bunds in DG Khan, Rajanpur and Rahimyar Khan Districts with discharges of 1.20 Million cusecs.
- The situation became more critical due to continuous heavy rainfall and high flows in hill torrents.

THE IMPACTS

Physical Impact

- Damages to Irrigation Network (Muzaffargarh, Rajanpur, DG Khan) including breaches in the main canals namely T.P Link Canal, Muzaffargarh Canal, D.G Khan Canal, Rangpur / Taliri Canal.
- Breaches in the Left Guide Bank of Jinnah Barrage and breaches in the Left Marginal Bund of Taunsa Barrage
- Damages to Flood Protection and drainage Structures (Bahawalpur (Guddu Barrage,)), DG Khan (Jampur, Kot Mithan), Multan, Sargodha, Faisalabad and Lahore.

SUMMARY OF BREACHES & CUTS

Sr. No	Name of Zone	Breaching Section	Breaches	Cuts made by Deptt.	Cuts made by Public
1	SARGODHA	1	1	-	-
2	D.G.KHAN	1	45	12	20
3	P.M.O. BARRAGES	-	10		1
4	Bahawalpur	-	11	-	-
GRAND TOTAL:		2	67	12	21

FINANCIAL IMPACT

(Rs. In Million)

S. No.	Name of Irrigation Zone	No. of Works	Type of Work	Estimated Cost
1	Sargodha	161	Flood Protection Bunds and Irrigation Infrastructure	1269.190
2	DG Khan	140		1100.000
3	PMO Barrages	20		637.000
4	Bahawalpur	29		176.240
5	Multan	11		12.353
6	Lahore	1		2.490
7	Faisalabad	3		2.172
	Total:	365		3199.445

FLOOD MANAGEMENT CHALLENGES

Flood 2010: Challenges

- Weakened flood bunds due to infrequency of floods resulting in extreme damage caused due to drying of embankments, cracking and rodent holes.
- This infrequency also induced lowering of guard in terms of institutional preparedness.
- Outdated flood management plans and SOPs and lack of any 'Plan B' in the event of a breach.
- Balanced view of the holistic flood scenario not brought out by hyper active electronic media.
- Timely relief cuts could have considerably reduced the damage but could not be made due to active resistance by locals.
- Three departmental machines were burnt / damaged by mobs and staff was manhandled at number of places. Most flood management actions could be implemented only with assistance from Army.
- Lack of leadership and coordination at District and Tehsil level.
- Overall governance and law and order / respect for authority and laws remained conspicuous by their absence during the entire flood emergency which undermined effective flood management.

RESTORATION STRATEGY

CATEGORIES OF REPAIR/RESTORATION WORKS

CATEGORY	DESCRIPTION	COST (RS. MIL.)
Immediate Works	Canal and embankment breaches	1,000
Medium Term	Strengthening of weak canal banks, repair of barrage support structures and buildings	2,200
Long Term	Strengthening and improvement of flood protection works on new bench marks. <ol style="list-style-type: none"> i. Strengthening and raising of existing bunds. ii. Proving wetting channels along the bunds. iii. Provision of Second Defence Bunds. iv. Improving the drainage capacity to provide relief in case of breaches. 	TBD

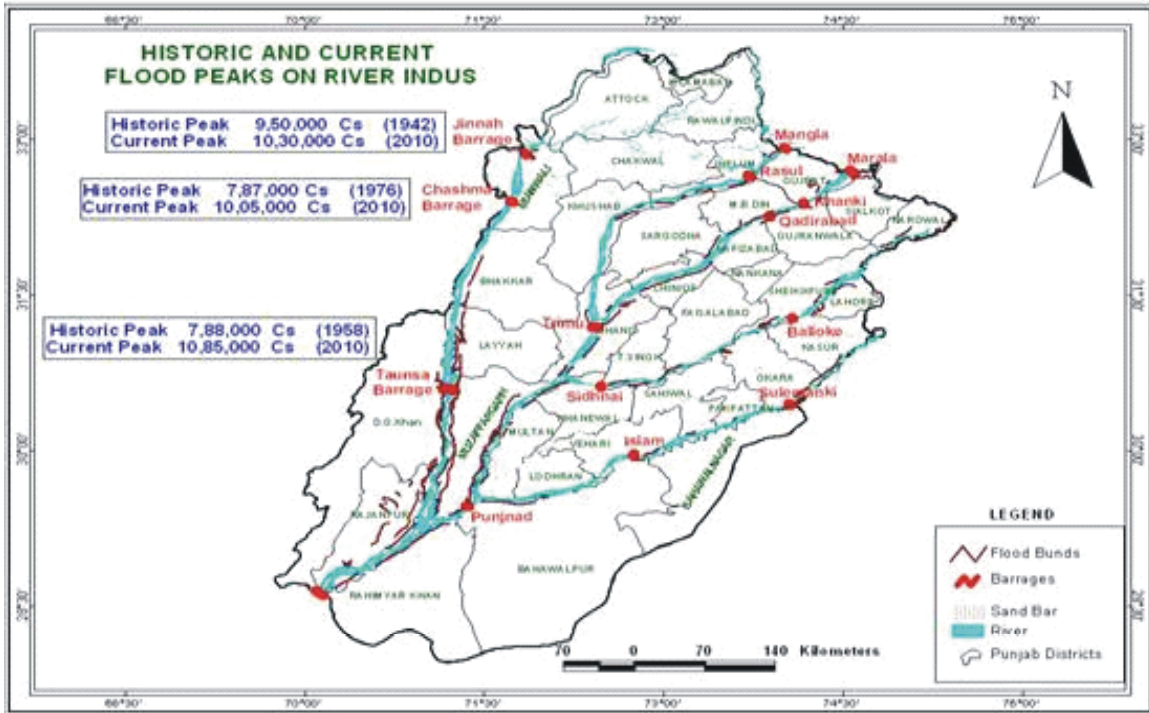
Restoration Strategy:

- Immediate works were carried out under emergency provisions.
- Wherever feasible, Departmental Machinery was used for breach closing.
- All emergency works were Supervised by Third Party Monitoring Consultants.
- LMB breach of Taunsa was closed on war footing basis on August 25, 2010.
- Breaches of Muzaffargarh and TP Link were plugged and channels were made operational by September 15, 2010.
- Damages to the distribution system would be repaired by end March 2011 and channels, being non-perennial in nature, would be opened during Kharif 2011.
- Repair works to the distributaries and minors being done through Departmental machinery while repair works to smaller minors and On Farm systems being done through farmer participation.
- Longer term works related to protection and drainage works will be taken up after establishment of new bench marks and comprehensive evaluation.

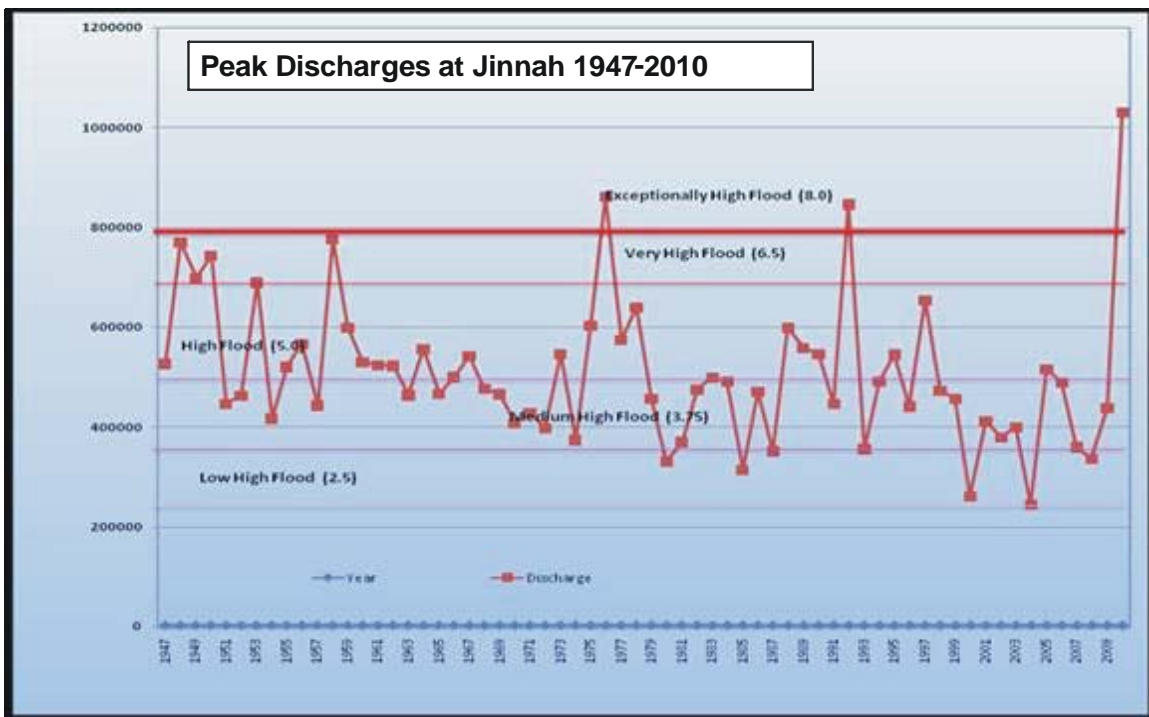
LESSONS LEARNT & OPPORTUNITIES

- Flood protection works should be given due importance in resource allocation irrespective of the infrequency of floods.
- Establishment of new bench-marks in terms of protection works heights and strengths and a fresh drainage plan for quick draining of flood waters from affected areas.
- Governance at local level is non-existent during emergencies. Need for a fresh look at our district and tehsil administration system to bring back the ability for effective leadership and coordination during emergencies.
- Regular updating of SOPs, regular drills for disaster management, regular capacity building/training of managers for flood protection, barrage management and public handling during crisis.
- A code of conduct for media during natural disasters to harness their outreach for effective management.
- Promotion of spirit of Self Reliance in emergency relief and post disaster rehabilitation.
- Build back better and safer structures.
- Invest in disaster preparedness and effective management of relief and early recovery when it happens.
- Better regulation of riverine/khadir areas and a proper regulatory and enforcement mechanism.
- Build water storages to mitigate the impact of super floods.

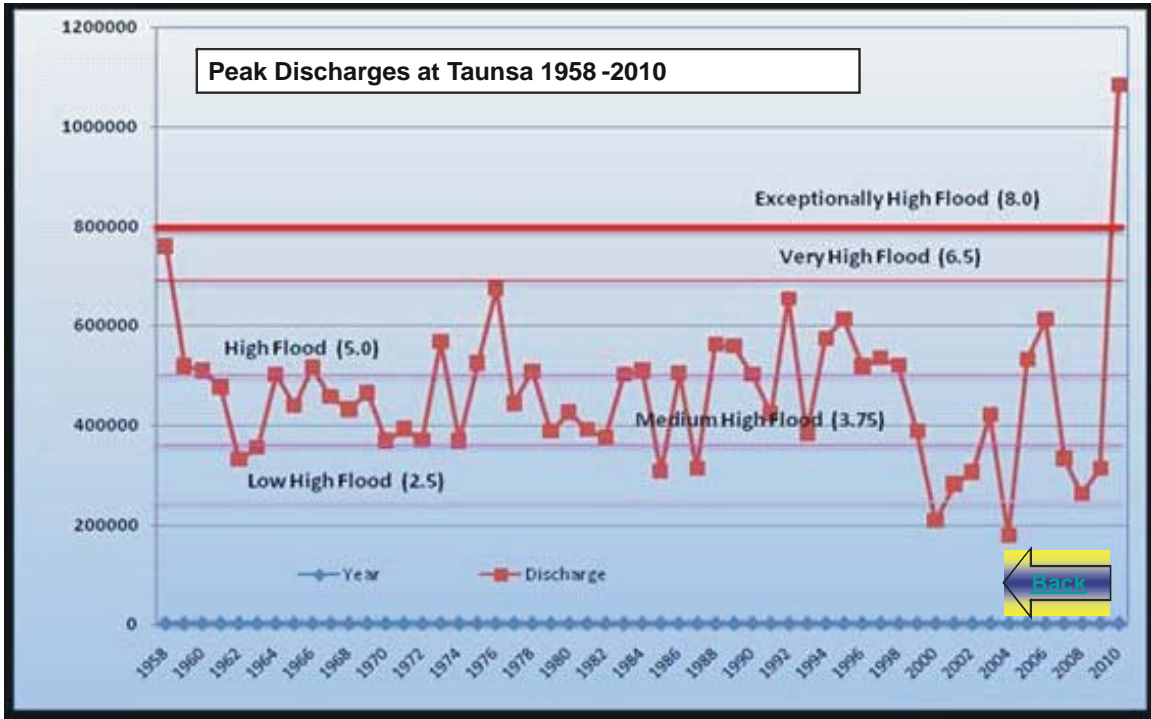
- Improve institutions and governance at district and tehsil level for effective leadership during crisis.
- Build positive synergies between an active media and positive spreading of message among masses during crisis.



Historic and Current Flood Peaks



Peak Discharges at Jinnah



Peak Discharges at Taunsa

KEY FEATURES OF FLOOD 2010

Duration

Barrage	Duration of Flood Stage (Hours)		
	High	Very High	Exceptional High
Kalabagh	131	85	30
Taunsa	116	97	27

