
بسم الله الرحمن الرحيم

TRAINING THEME

Water for All – Lessons Learnt and Meeting Future challenges

Issue of Water Management in Pakistan

Presented By

Mr. FIDA HUSSAIN

At

4th NARBO Training in Sri Lanka

(6th – 10th November 2006)

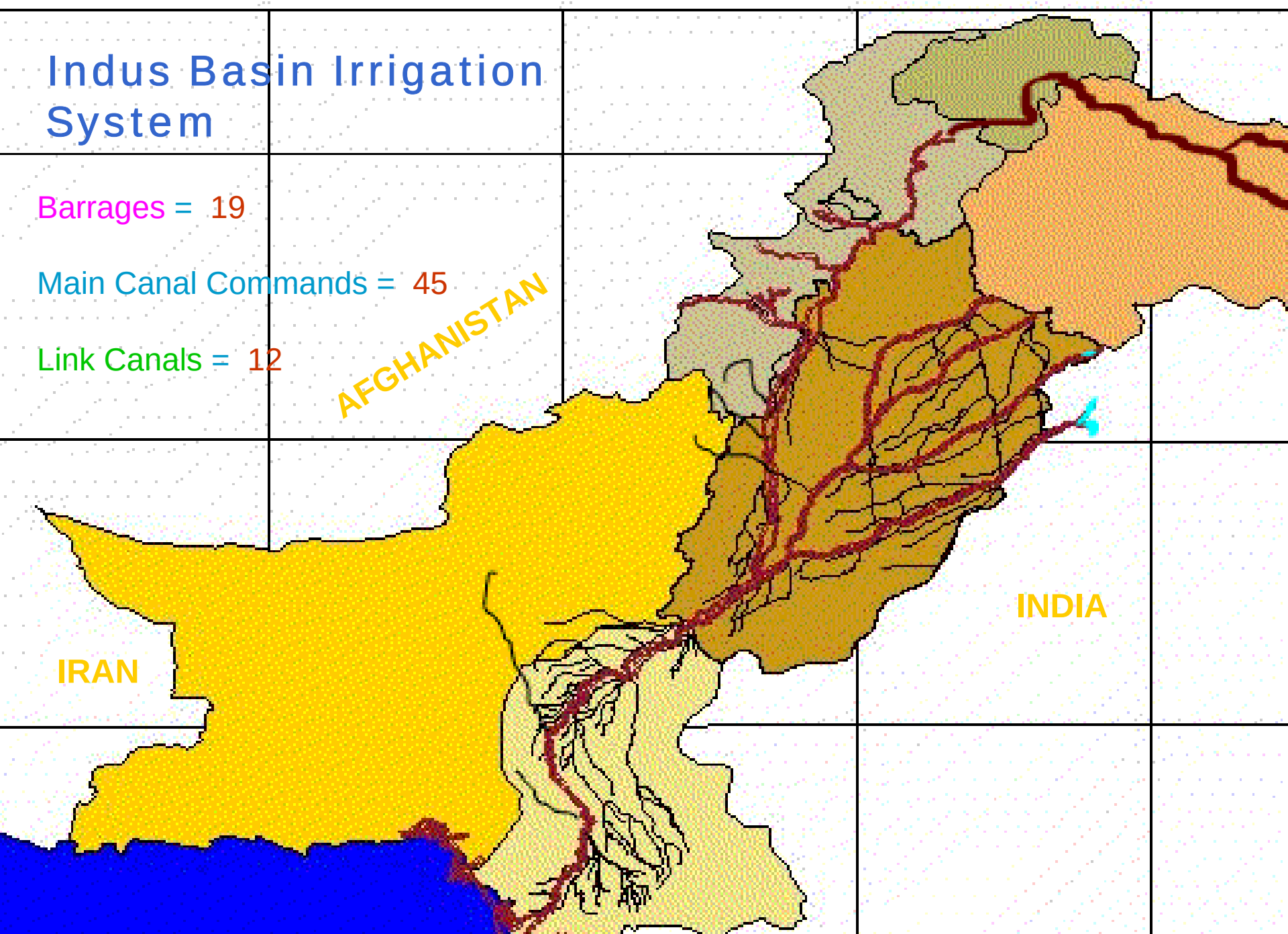
PAKISTAN'S PROFILE

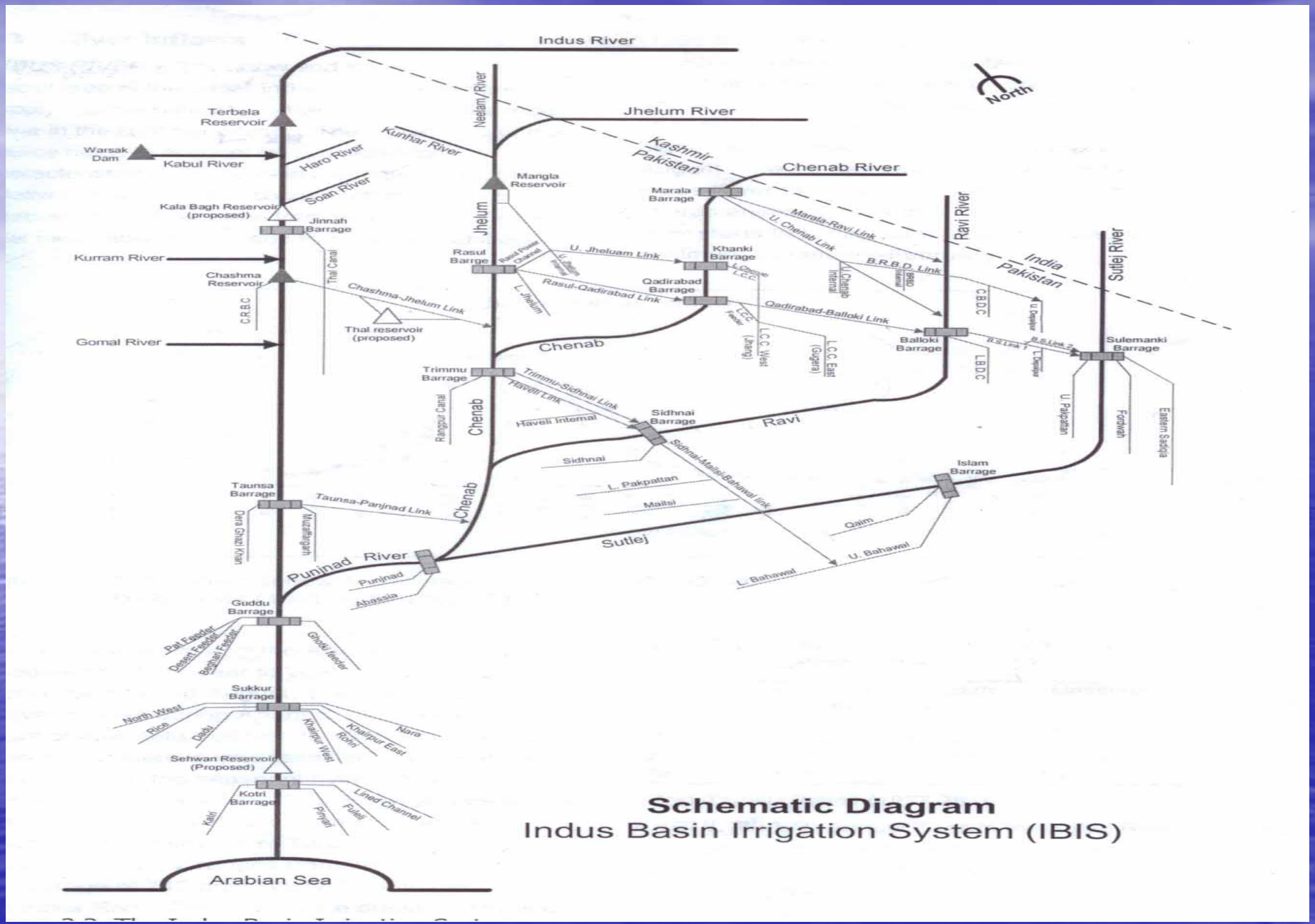
• POPULATION:	146 MILLION
• GEOGRAPHICAL AREA:	796,100 KM^2
• IRRIGATED AREA:	36 MILLION ACRES
• ANNUAL WATER AVAILABILITY	141 MAF
• ANNUAL CANAL WITHDRAWALS:	104 MAF
• GROUND WATER PUMPAGE:	42 MAF
• PER CAPITA WATER AVAILABLE:	1200 M^3
• AGRICULTURE PRODUCE:	25 % OF GDP

Rim Stations: Indus @ Tarbela, Jhelum @ Mangla, Chenab @ Marala, Kabul @ Nowshera


RIVERS OF PAKISTAN
INDUS
JHELUM
CHENAB
WESTERN RIVERS
AFGHANISTAN
RAVI
SUTLEJ
BEAS
INDIA
IRAN
EASTERN RIVERS

Indus Basin Irrigation System



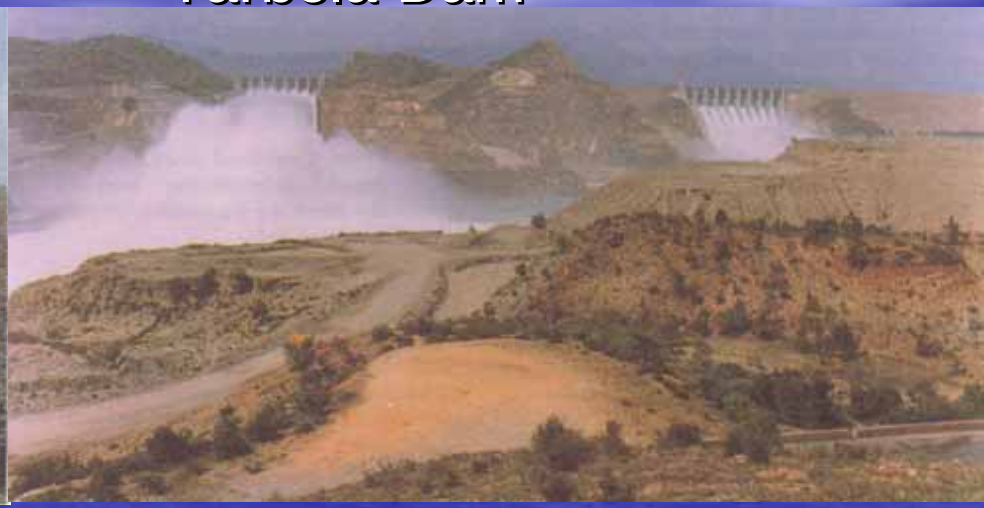


Schematic Diagram
Indus Basin Irrigation System (IBIS)

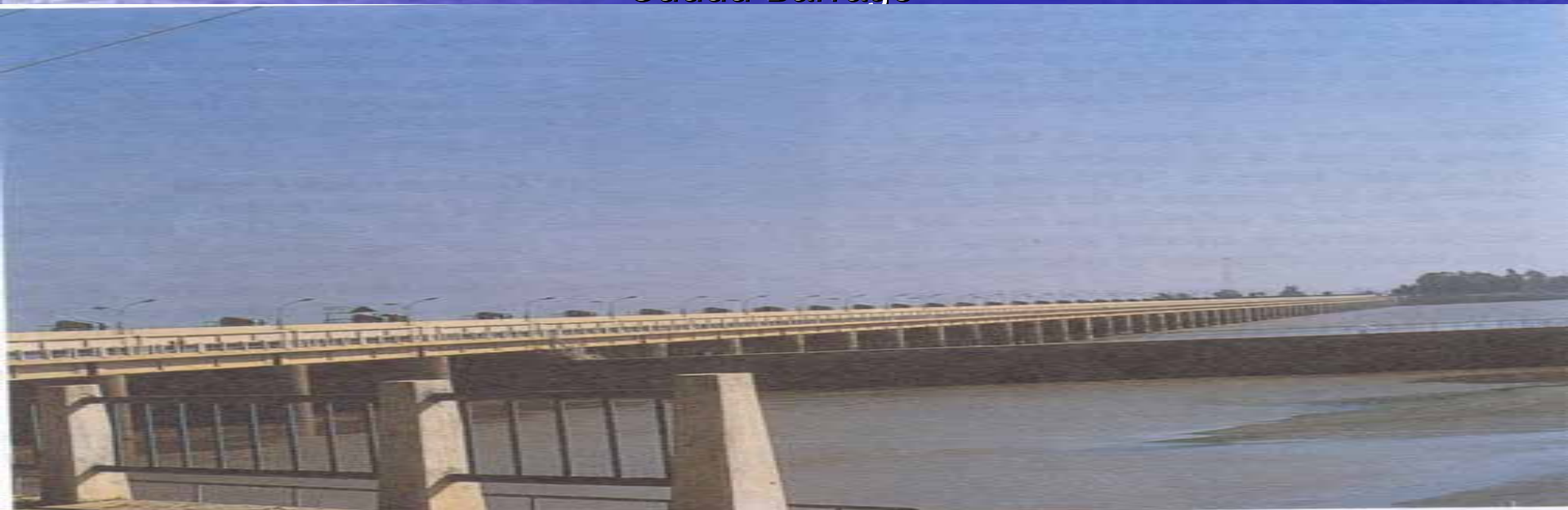
General view of some Important Locations

Mangla Dam

Tarbela Dam



Guddu Barrage



IRRIGATION NETWORK OF PAKISTAN

THE IRRIGATION SYSTEM OF PAKISTAN IS THE LARGEST INTEGRATED IRRIGATION NETWORK IN THE WORLD, SERVING 36 MILLION ACRES OF CONTIGUOUS CULTIVATED LAND. THE SYSTEM IS FED BY THE WATERS OF THE INDUS RIVER AND ITS TRIBUTARIES.

SALIENT FEATURES OF IRRIGATION NETWORK

MAJOR STORAGE RESERVOIRS (Existing live storage 12.022 MAF)	3
BARRAGES	19
INTER-RIVER LINK CANALS	12
IRRIGATION CANAL COMMANDS	45
SMALL DAMS	84

CURRENT WATER AVAILABILITY IN PAKISTAN

AVAILABILITY (Average)

- From Western Rivers at RIM Stations 141 MAF
- Uses above Rim Stations 5 MAF
- TOTAL 146 MAF

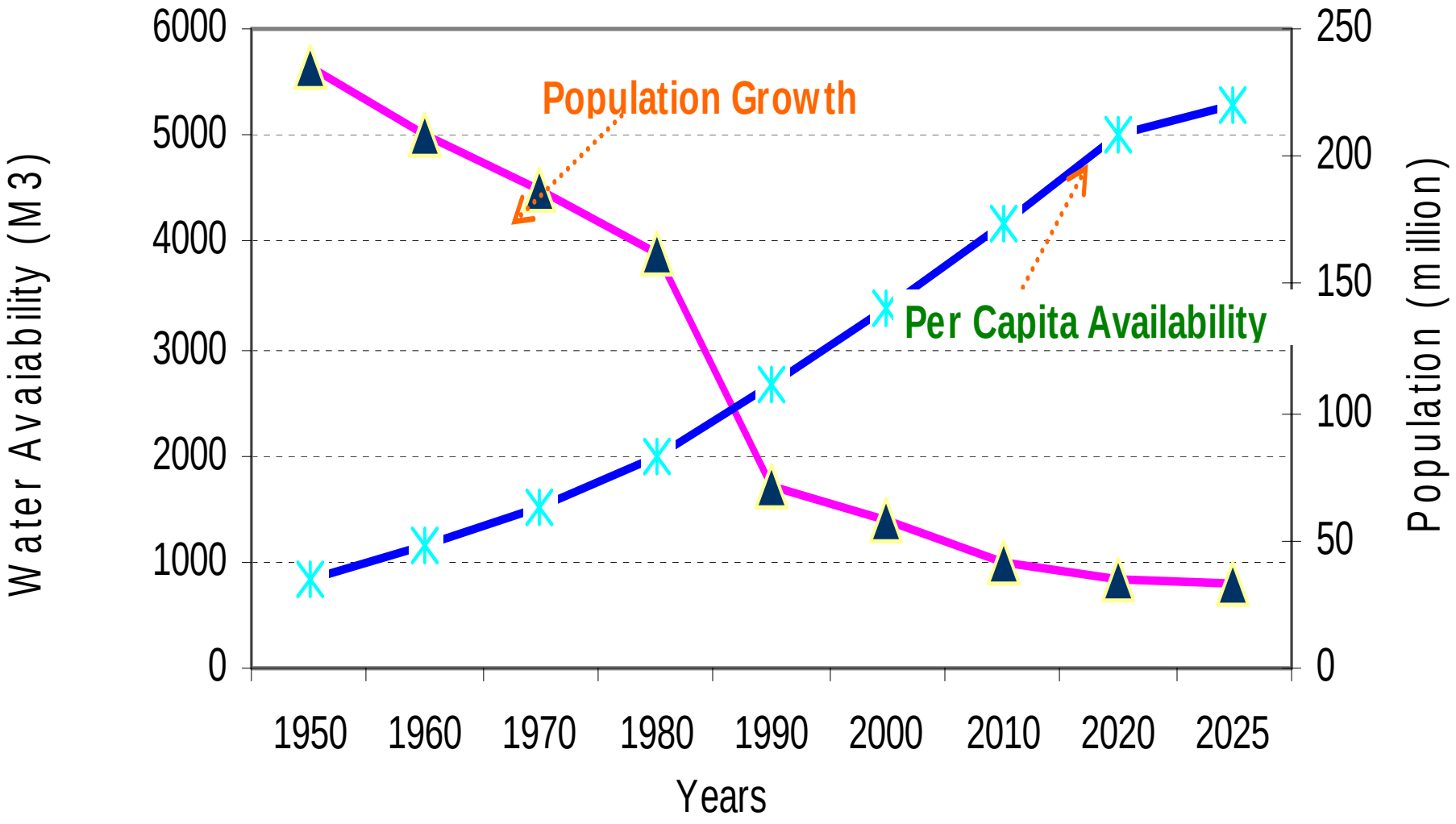
USES

- Above RIM Stations 5 MAF
- Canal Diversion 104 MAF
- TOTAL 109 MAF
- BALANCE AVAILABLE 37 MAF

CURRENT STORAGE POSITION

Reservoir	Original Live Storage (MAF)	Current Live Storage		Live Storage by Year 2010	
		MAF	%	MAF	%
Tarbela	9.680 (1974)	7.045	27.78	6.710	30.68
Mangla	5.341 (1967)	4.542	14.96	4.460	16.50
Chashma	0.717 (1971)	0.435	39.33	0.400	44.21
Total	**15.738**	**12.022**	**23.61**	**11.57**	**26.48**

Per Capita Water Availability



IRSA's Role and Its Challenges

Indus River System Authority (IRSA):

It was established in 1992 through an Act of Parliament to oversee the implementation of Water Apportionment Accord 1991.

Role:

Under IRSA Act XXII 1992, its main functions are as follows:

(a) Lay down the basis for the regulation and distribution of surface waters amongst the Provinces according to the allocations and policies spelt out in the Water Accord;

(b) review and specify river and reservoir operation patterns and periodically review the system of such operation

c) Coordinate and regulate the activities of the Water and Power Development Authority in exchange of data between the Provinces in connection with the gauging and recording of surface water-flows;

c) compile and review canal withdrawal indents as received from the Provinces on 5-daily or, as the case may be, on 10-daily basis and issue consolidated operational directives to Water and Power Development Authority for making such releases from reservoirs as the Authority may consider appropriate or consistent with the Water Accord;

- settle any question that may arise between two or more Provinces in respect of distribution of river and reservoir waters; and

- consider and make recommendations on the availability of water against the allocated shares of the Provinces within three months of receipt of fully substantiated water accounts for all new water projects for the assistance of the Executive Committee of the National Economic Council.

Challenges

- IRSA's primary challenge relates to conservation of the existing resources of surface waters to increase the transparency and equity of water allocation at all levels for the trust building amongst the provinces of Pakistan.
- Huge water losses in River System affects the Provincial Shares and hence disturb IRSA's distribution mechanism and eventually concerns over the water conservation.
- Thus, the current challenge to IRSA and of course to Pakistan, is to cope with such losses.

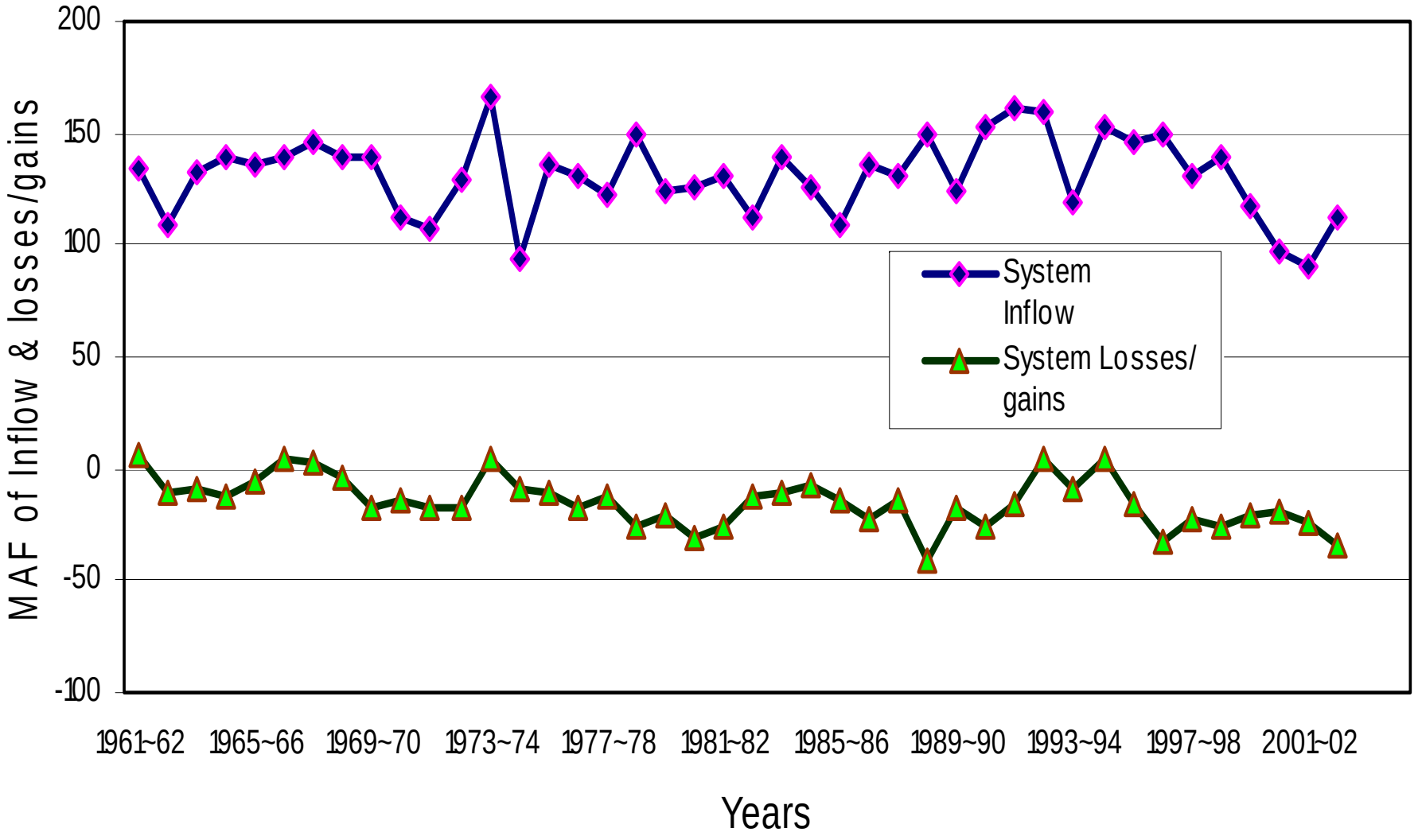
Overview of System Losses

- The entire River system largely shows net annual loss of about 15 MAF.
- Prior to 2004, the net annual losses were estimated @ 15% but during 2004 losses experienced to the extent of 51%.
- In Kharif 2006, losses were further increased to 50% in certain river reaches.
- Seasonal losses/gains in Pre/post-Tarbela Periods as given as under:

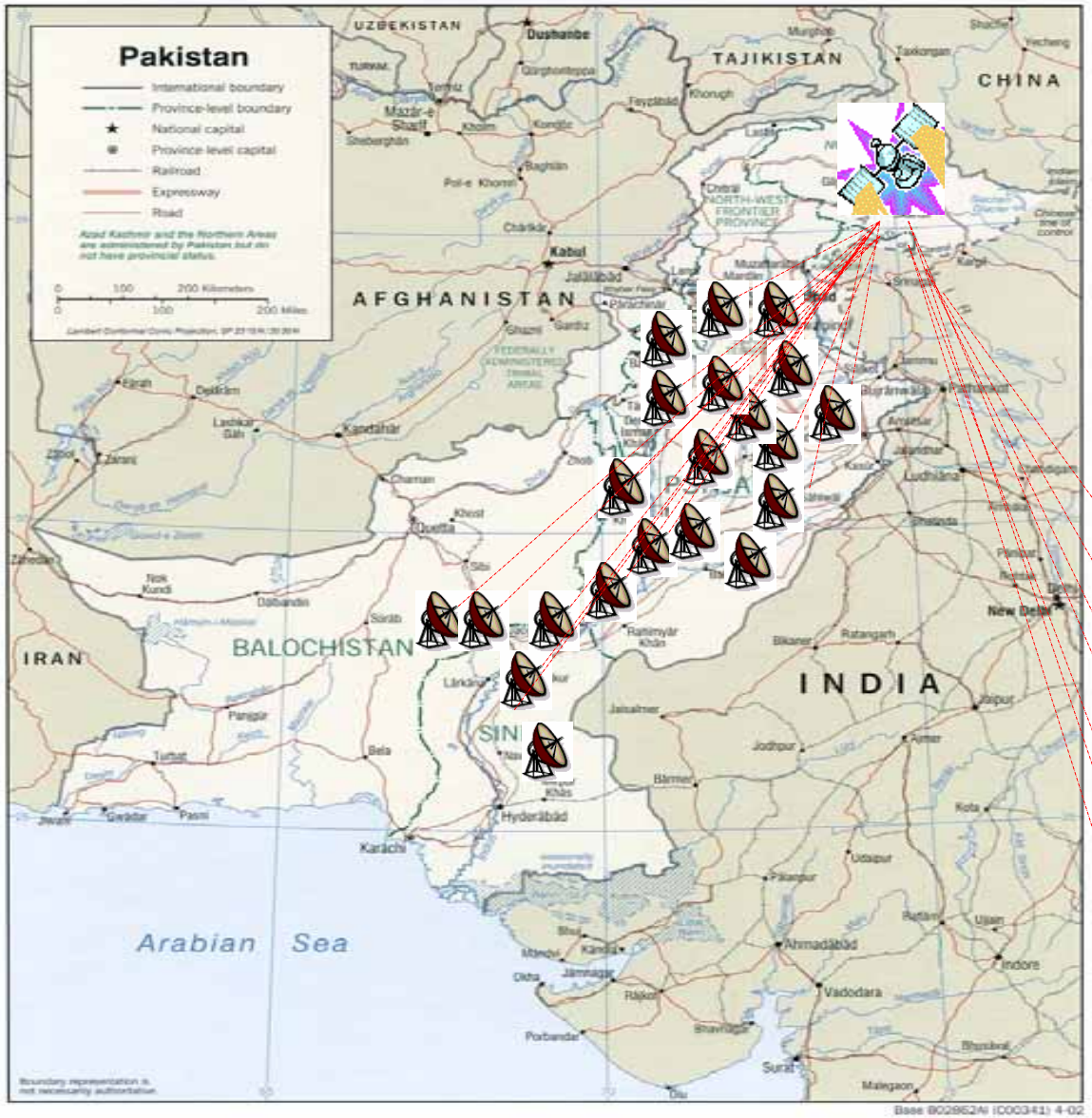
System Losses/Gains

Period	System Losses/Gains (MAF)		
	Kharif	Rabi	Annual
Pre-Tarbela	-13.79	+3.63	-10.16
Post-Tarbela	-17.49	-1.14	-18.90

River System Inflow ~Losses/gains



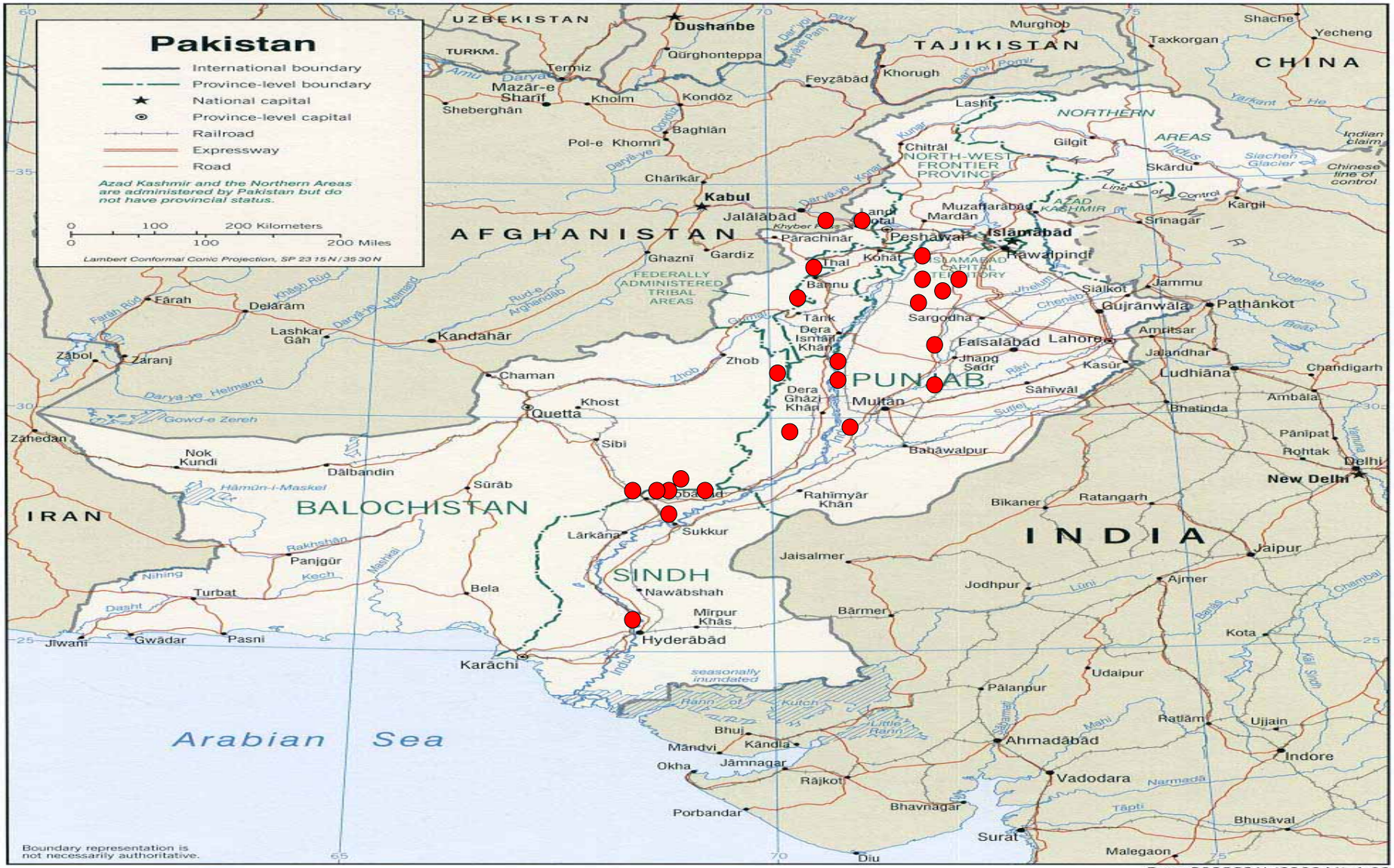
TELEMETRY SYSTEM



MONITORING SITES

Data such as Water discharges, level and gate positions from 23 remote sites is made available to the following monitoring sites via VSAT link. Additionally voice communication is also available from remote sites to IRSA HQs.

GEOGRAPHICAL LOCATION OF SITES



CONCLUSION

- In order to meet with the future challenges relating to the water management (in Pakistan) on sustainable basis through an environmental approach, among the other factors, the management of unpredictable system losses is of vital importance.

- The losses should be managed through latest modeling technique on sustainable basis.


THANKS