

PRESENTATION
ON
WATER SECTOR DEVELOPMENT

By
AFTAB AHMAD KHAN SHERPAO

Minister for Water and Power
At
Pakistan Development Forum

March 18, 2004

COUNTRY PROFILE

- POPULATION: 141 MILLION
- GEOGRAPHICAL AREA: 796,100 KM²
- IRRIGATED AREA: 36 MILLION ACRES
- ANNUAL WATER AVAILABILITY AT RIM STATIONS: 142 MAF
- ANNUAL CANAL WITHDRAWALS: 104 MAF
- GROUND WATER PUMPAGE: 44 MAF
- PER CAPITA WATER AVAILABLE (2004): 1200 CUBIC METER

CURRENT WATER AVAILABILITY IN PAKISTAN

AVAILABILITY (Average)

o From Western Rivers at RIM Stations	142 MAF
o Uses above Rim Stations	5 MAF
TOTAL	147 MAF

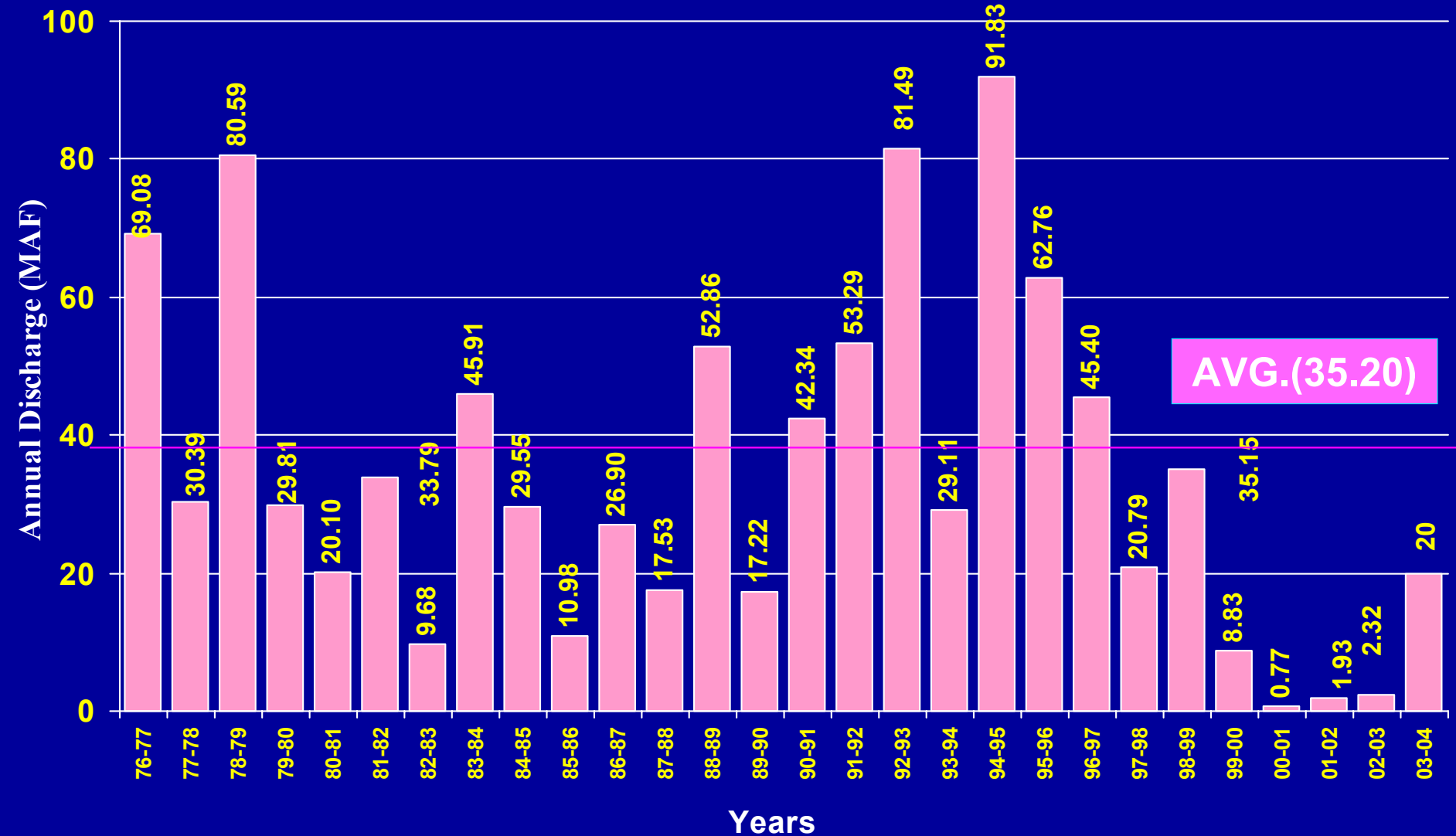
USES

o Above RIM Stations	5 MAF
o Canal Diversion	104 MAF
TOTAL	109 MAF

BALANCE AVAILABLE	38 MAF
-------------------	--------

ESCAPAGES BELOW KOTRI

(HYDROLOGICAL YEAR FROM APRIL TO MARCH)



WATER REQUIREMENT AND AVAILABILITY

Requirement / Availability	Year	
	2004 (MAF)	2025 (MAF)
Surface Water Requirements	115	135
Average Surface Water Diversions	104	104
Shortfall	11 (10 %)	31 (23%)

LOSS OF STORAGE CAPACITY

Reservoirs	Live Storage Capacity (MAF)				
	Original	Year 2004		Year 2010	
Tarbela	9.70	7.28	25%	6.40	34%
Chashma	0.70	0.40	43%	0.32	55%
Mangla	5.30	4.24	20%	3.92	26%
Total	15.70	11.91		10.64	
Combined Storage Loss					
Combined Storage Loss		3.79 (24%)		5.06 (32 %)	

DEVELOPMENT POTENTIAL OF SURFACE WATER RESOURCES

	<u>MAF</u>
○ Escapages Below Kotri	35
○ Tentative Requirements Below Kotri	10
○ Anticipated Water Use By Upper Riparian States	5
○ Balance Available For Development	20

ON GOING WATER SECTOR PROJECTS

Name of Project	Storage (MAF)	Irrigable Area (Acres)	Installed Capacity (MW)	Cost (Rs Million)	Completion Date
Mangla Dam Raising Project	2.90	-	300	62,553	June 2007
Gomal Zam Dam	1.14	163,086	17.4	12,823	Sept 2006
Mirani Dam	0.30	33,200	-	5,860	June 2006
Sabakzai Dam	0.02	25,000	-	1,000	June 2005
Satpara Dam	0.08	19,920	13	2,092	March 2006
Greater Thal Canal	-	1,530,000	-	30,467	June 2007
Kachhi Canal	-	713,000	-	32,450	June 2007
Rainee Canal	-	412,400	-	17,947	Dec. 2007
Total:	4.44	2,896,606	330.4	165,192	

Outlay for above stated projects = US \$ 2.9 Billion

IMPACT OF ONGOING PROJECTS

The Ongoing Projects shall result in poverty alleviation due to the following:

- **Additional Storage** = **4.44 MAF**
- **Additional Land Irrigated** = **2.9 Million Acres**
- **Income to Farmers** = **Rs.12 Billion/Year**
- **New Jobs** = **0.5 Million**

INVESTMENT PLAN

1. STORAGES

2. NEW CANALS

3. SYSTEM IMPROVEMENT

i) Modernization of Barrages

ii) Rehabilitation and Remodelling Irrigation System

iii) Lining of Canals

iv) Institutional Strengthening and Capacity Building

4. DRAINAGE SYSTEM

PROSPECTIVE STORAGE PROJECTS

Name of Project	Storage (MAF)	Installed Capacity (MW)	Estimated Cost US \$ Billion	Status
Basha Dam	7.34	4,500	5.9	Feasibility Study
Kalabagh Dam	6.10	3,600	5.4	Ready for Construction
Skardu Dam	15.52	4,000	6.5	Feasibility Study
Akhori Dam	6.00	600	1.6	-do-
Munda Dam	0.70	740	1.0	-do-
Total	35.66	13,440	20.4	

Outlay for above stated projects = US \$ 20.4 Billion

Mangla Dam Raising Project

River	Jhelum
Original Storage capacity	5.30 MAF (1967)
Current Storage capacity	4.24 MAF (2004)
Capacity Lost	20%
Height of Dam to be Raised	30 ft
Additional Storage	2.9 MAF
Additional Power	300 MW
Mangla Raising Project Cost	Rs. 62.55 Billion (US \$1.1 Billion)
Dam Raising Works	Rs. 36.29 Billion (58%)
Resettlement and Compensation	Rs. 26.25 Billion (42%)
Start of Construction	May, 2004
Completion	June, 2007

Mangla Raising Project

Resettlement and Compensation Package

Land and Affected	15780 acres
Population Affected	43,771 Persons
No. of houses Affected	8023
Total Compensation Package	Rs. 26.5 Billion
Compensation to old Affectees	Rs. 0.2 Million each
Compensation to new Affectees	Rs. 0.3 Million each
Compensation for Land	Market Price + 15%
Compensation for houses	<ul style="list-style-type: none">• Market Price + 10% + Demolished material• Minimum Compensation = Rs 300,000• Alternate Plots on Payment of cost of land only

Mangla Raising Project

Resettlement and Compensation Package

Special Package for affectedees	<ul style="list-style-type: none">• 1 New City Near Mirpur• 4 New Towns• 1 Major Vocational Centre in Mirpur• 4 Male Vocational Centres in the four Towns• Strengthening of 4 existing Female Vocational Centres
Benefits to GOAJK	<ul style="list-style-type: none">• Royalty/ Water Use Charges @ Rs 0.15/kwh• Concessional Tariff @ 2.59/kwh• Fishing Rights• Drinking Water from Lake

PROSPECTIVE IRRIGATION INFRASTRUCTURE PROJECTS

Name of Project	Area to be Irrigated (Acres)	Cost (Rs Million)	Tentative Start Date
Jalalpur Canal Project	160,000	2,150	Beyond 2005
Dajal Canal Extension Project	340,000	9,019	-do-
Cholistan Project – 1	482,000	3,618	-do-
Shakargarh Canal Irrigation System	175,000	7,003	-do-
Sehwan Barrage Complex	2,430,000	37,701	-do-
North West Canal Remodelling Project	956,936	6,208	-do-
Chashma Right Bank Canal 1st Lift	285,652	19,200	-do-
Balochistan Small Irrigation Schemes	-	1,000	-do-
TOTAL	4,829,588	85,899	

Outlay for above stated projects = US \$ 1.5 Billion

Prospective System Improvement Billion Rupees

S.No.	Name of Project	Location	Cost
1.	Modernization of Barrages	All over Pakistan	100
2.	Rehabilitation of Canals	Punjab	21
3.	Lining of Canals	Punjab	31
4.	Rehabilitation of Canals	Sindh	13
5.	Lining of Canals	Sindh	25
6.	Rehabilitation of Canals	N.W.F.P	8
7.	Lining of Canals	N.W.F.P	7
8.	Rehabilitation of Canals	Balochistan	6
9.	Lining of Canals	Balochistan	5
	Total		216

Outlay for above stated projects = US \$ 2.8 Billion

Summary of Investment Requirements (Over Next 10 Years)

S.No	Item	Estimated Cost (Billion US \$)
1.	Dams	6.0
2.	New Canals	3.0
3.	System improvement	3.8
4.	Drainage	2.0
	Total	14.8

Economics of Water Development

- Average water escaping to sea after catering for maximum 10 MAF below Kotri (Post Tarbela Period) is 20 MAF
- 1 MAF irrigates 0.3 million acres. If 20 MAF water would have been utilized, 6.0 million acres would have been cultivated, bringing benefit of US \$ 2.5 billion to the national economy annually.