

**PRESENTATION
ON
ISSUES IN
WATER RESOURCE MANAGEMENT**

**BY
ASHFAQ MAHMOOD
SECRETARY, WATER AND POWER**

**PAKISTAN ADMINISTRATIVE STAFF COLLEGE
APRIL 26, 2005**

STRUCTURE OF PRESENTATION

- Basic information about water availability and use
- Major Infrastructure issues
- Plans to address Infrastructure issues
- Investment Plan
- National Water Policy

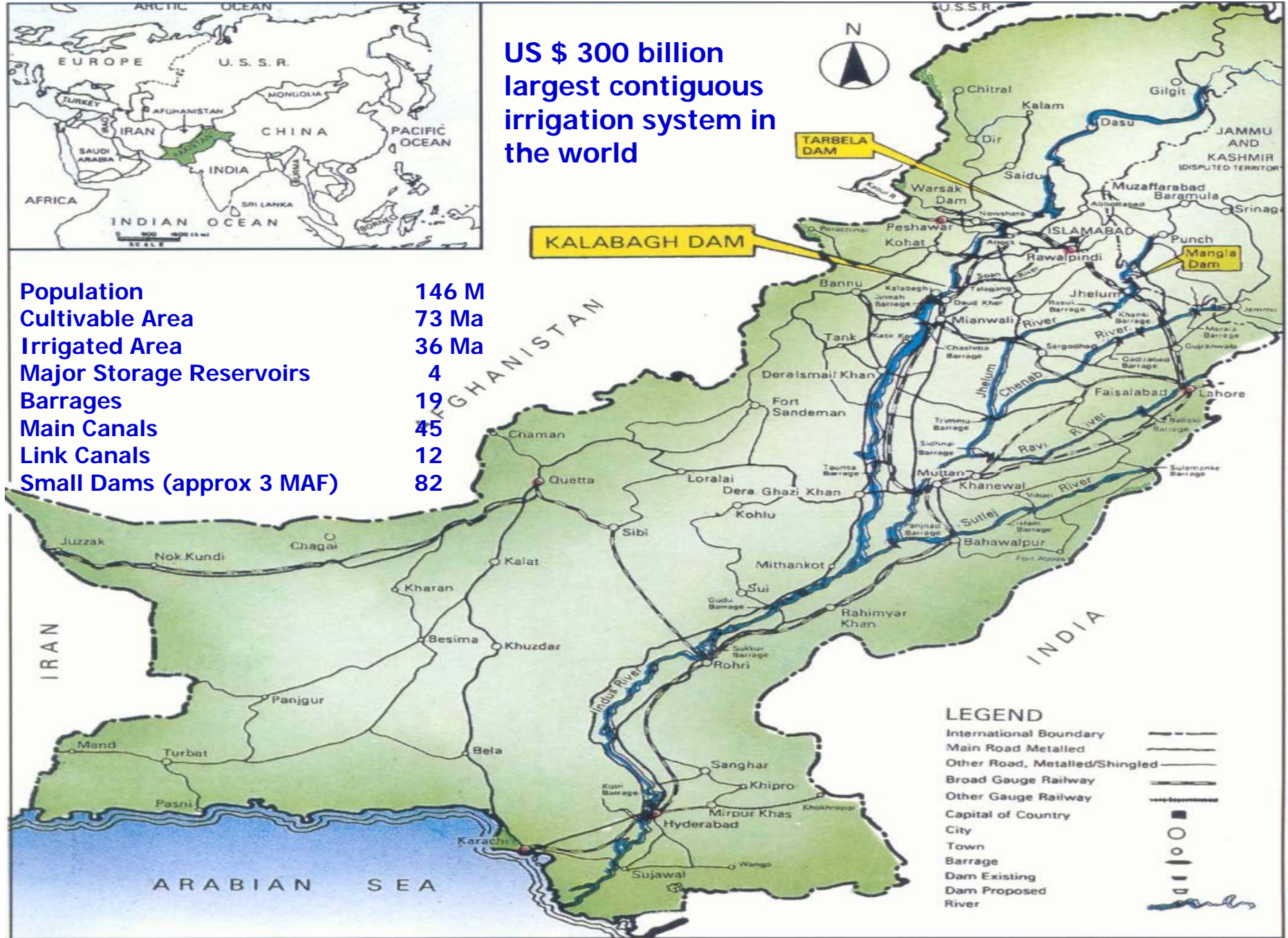
IMPOTANCE OF WATER RESOURCES FOR NATIONAL ECONOMY AND POVERTY ALLEVIATION

- Critical input for agriculture to meet food and fiber requirements, drinking water, sanitation, industry, environment, etc.
- Contribution to GDP equivalent to 25% (*\$ 16 billion annually*)
- 64% of population depends on agriculture
- 80% of rural work force engaged in agriculture
- Responsible for 60 to 70% exports



**US \$ 300 billion
largest contiguous
irrigation system in
the world**

Population	146 M
Cultivable Area	73 Ma
Irrigated Area	36 Ma
Major Storage Reservoirs	4
Barrages	19
Main Canals	45
Link Canals	12
Small Dams (approx 3 MAF)	82



IRRIGATION WATER BALANCE IN THE INDUS BASIN

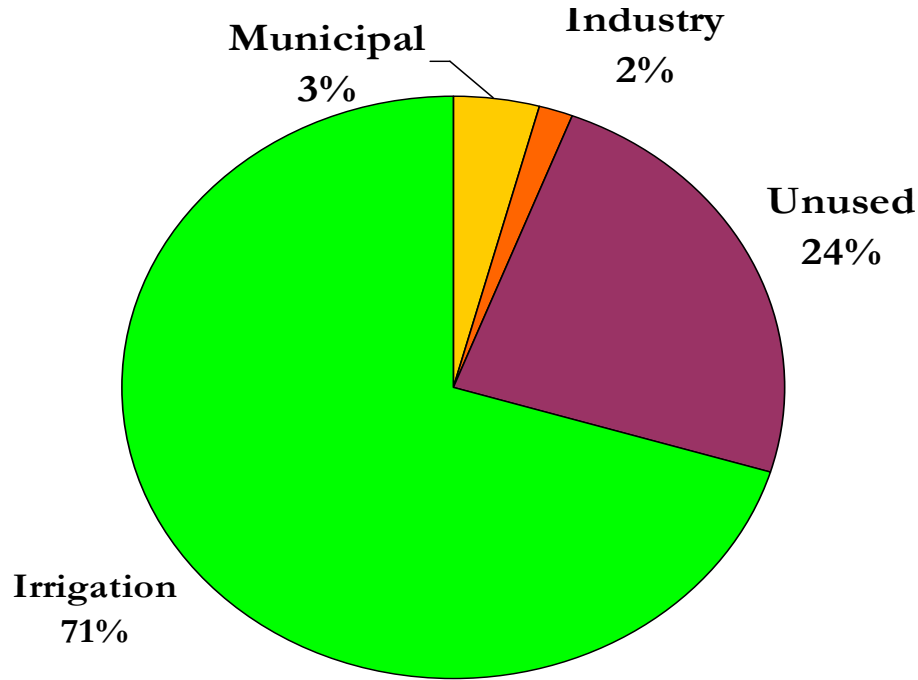
	MAF
▪ Average annual river flows	142
▪ Unutilized River Flow below rim stations	38
▪ Net System losses upto Kotri	3
▪ Escapages to sea	35
▪ Canal diversions	104
▪ Irrigation System Losses	42*
▪ Surface water availability at Farmgate	62
▪ Ground water availability at Farmgate	40
▪ Total water availability at Farmgate	102

Water is a finite resource

* Out of 42 MAF, 35 MAF seeps to become groundwater

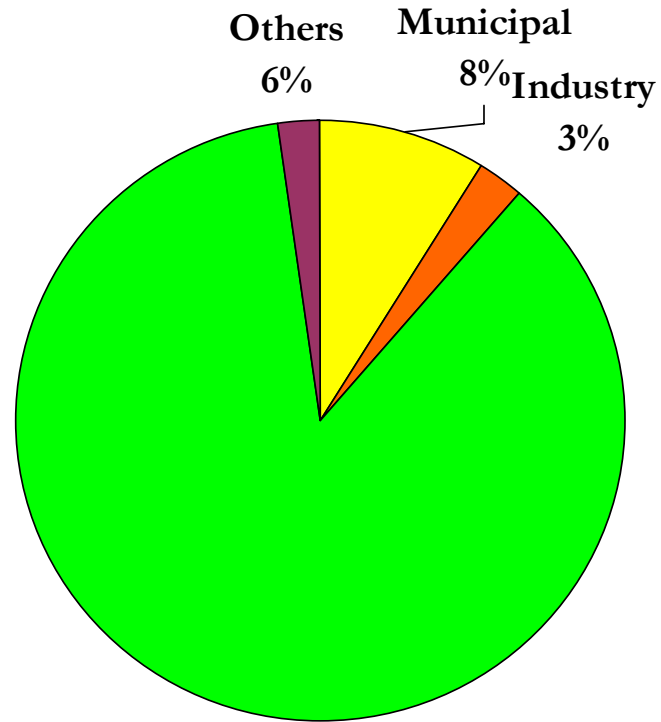
WATER USE PATTERN

2004

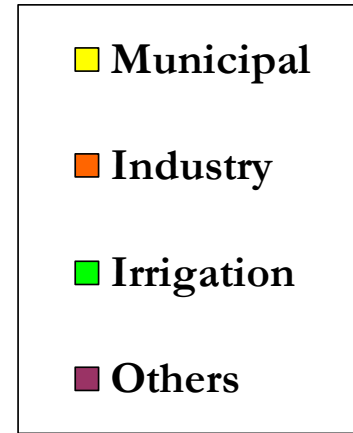


Total Requirements = 124 MAF
 Availability at Farmgate = 107 MAF
 Shortfall = 17 MAF (14%)
 Per Capita Availability = 1200 CM/Year

2025



Irrigation 83% Total Requirements = 149 MAF
 Anticipated Availability (No additional storage scenario) = 110 MAF
 Shortfall = 39 MAF (26%)
 Per Capita Availability = 800 CM/Year



We are short of water; implications – Poverty; Think what to do ? ⁶

MAJOR WATER INFRASTRUCTURE ISSUES IN PAKISTAN

- **Inadequate Storages**
- **Water Conveyance Infrastructure** (*Inefficient, deteriorated and inadequate*)
- **Disposal Of Drainage Effluent and Land Reclamation** (*Inadequate*)
- **Flood Control**
- **Water Management** (*inequity, outdated water use practices, limited beneficiary participation & institutional capability, etc*)
- **Investment** (*Inadequate availability of funds for development & maintenance*)

STORAGES

Present Live Storage Capacity *(major dams)*

Original = 15.70 MAF

Current = 11.91 MAF

Plans for Additional Storages :

At least Two large Dams

Augment existing Storages

Small and Medium Dams

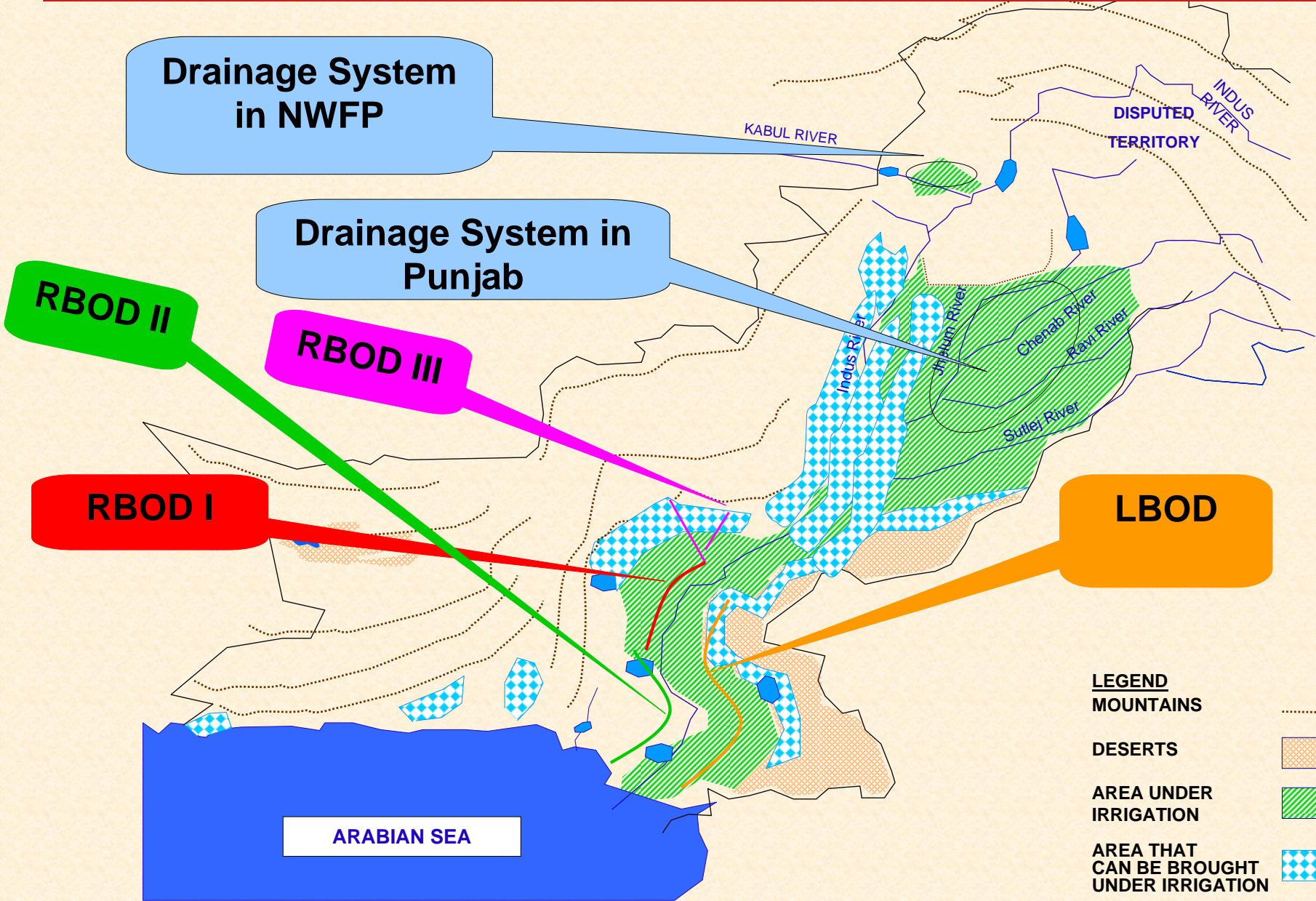
WATER CONVEYANCE INFRASTRUCTURE

- **Modernization of Barrages**
(Sukkar Repair , Punjab Project for 7 Barrages)
- **System improvement through remodeling , rehabilitation and lining of canals and water courses** *(19000 km canal lining , 86003 Water Courses)*
- **New on-going canals** *(Greater Thal , Kacchi , Raineer)*
- **New Planned Canals** *(Jalalpur , Dajal Extn , Shakargarh , Chashma lift , Baluchistan canals etc.)*

DRAINAGE AND LAND RECLAMATION

- **Safe disposal of drainage effluents** (*on going : such as Upper Rechna, Shorkot Kamalia, Fordwah Sadqia, Gojra Khewra, RBOD-I, RBOD-II, ROBD-III ; and planned schemes: such as Bannu Scarp, Kafur Dheri, Sarghoda Drainage, LBOD Remodelling, Lasbela Drainage, Pat Feeder Drainage, etc*)
- **Improve on-farm and off-farm drainage of irrigated lands**
- **Develop inter-provincial Consensus on Drainage Accord**
- **Use of chemicals (gypsum, etc) and bio-chemical techniques to tackle sodicity problems**

DRAINAGE NETWORK IN PAKISTAN



Drainage System in NWFP

Drainage System in Punjab

RBOD II

RBOD III

RBOD I

LBOD

ARABIAN SEA

- LEGEND**
- MOUNTAINS (dotted line)
 - DESERTS (orange stippled area)
 - AREA UNDER IRRIGATION (green hatched area)
 - AREA THAT CAN BE BROUGHT UNDER IRRIGATION (blue and white checkered area)

FLOOD CONTROL

- **Improve Flood Forecasting and warning system**
- **Promote flood retardation through construction of multiple storages and other structures**
- **Construction of dykes and spurs wherever required**
- **Adequate maintenance of existing infrastructure**

CURRENT REFORM & MANAGEMENT AGENDA

Institutions:

- Provincial Irrigation Departments**
- Provincial Irrigation and Drainage Authorities**
- Area Water Boards**
- Farmers Organizations**

Water use :

- Indus River System Authority (*telemetry project*)**
- Water Audit**
- Rationalizing water allowances**
- Promoting new technologies/practices**
- Ground Water Management Act**

Continued.....

Drainage Management:

- Drainage Accord

Land Use and Ecology:

- River Law
- Wetland Management
- Rehabilitation, Resettlement Reforms

Financial Sector Improvements:

- Cost recovery
- Beneficiary participations
- Incentives

MINIMUM INVESTMENT REQUIREMENT FOR WATER INFRASTRUCTURE

S.No	Item	Estimated Investment (2005-2011) (Billion Rs)
1.	Dams	378
2.	Irrigation	278
4.	Drainage and Reclamation	47
5.	Floods	6
	Total	709 Or US \$12 Billion Approx.
	Vision 2025 Estimates (2005 to 2025)	US \$ 33 billion

National Water Policy

- **Integrated Water Sector Planning**
- **Surface Water Irrigation** (*enhancing water availability, improve irrigation practices, expand infrastructure and increase its sustainability*)
- **Ground Water Irrigation**
- **Barani Irrigation**
- **Drainage and Reclamation**
- **Flood Management**
- **Drought Management**
- **Water for Drinking and Sanitation**
- **Water for Industry**
- **Water for Environment**
- **Equity and Water Rights**
- **Water Quality**
- **National Water Council**

Thank You