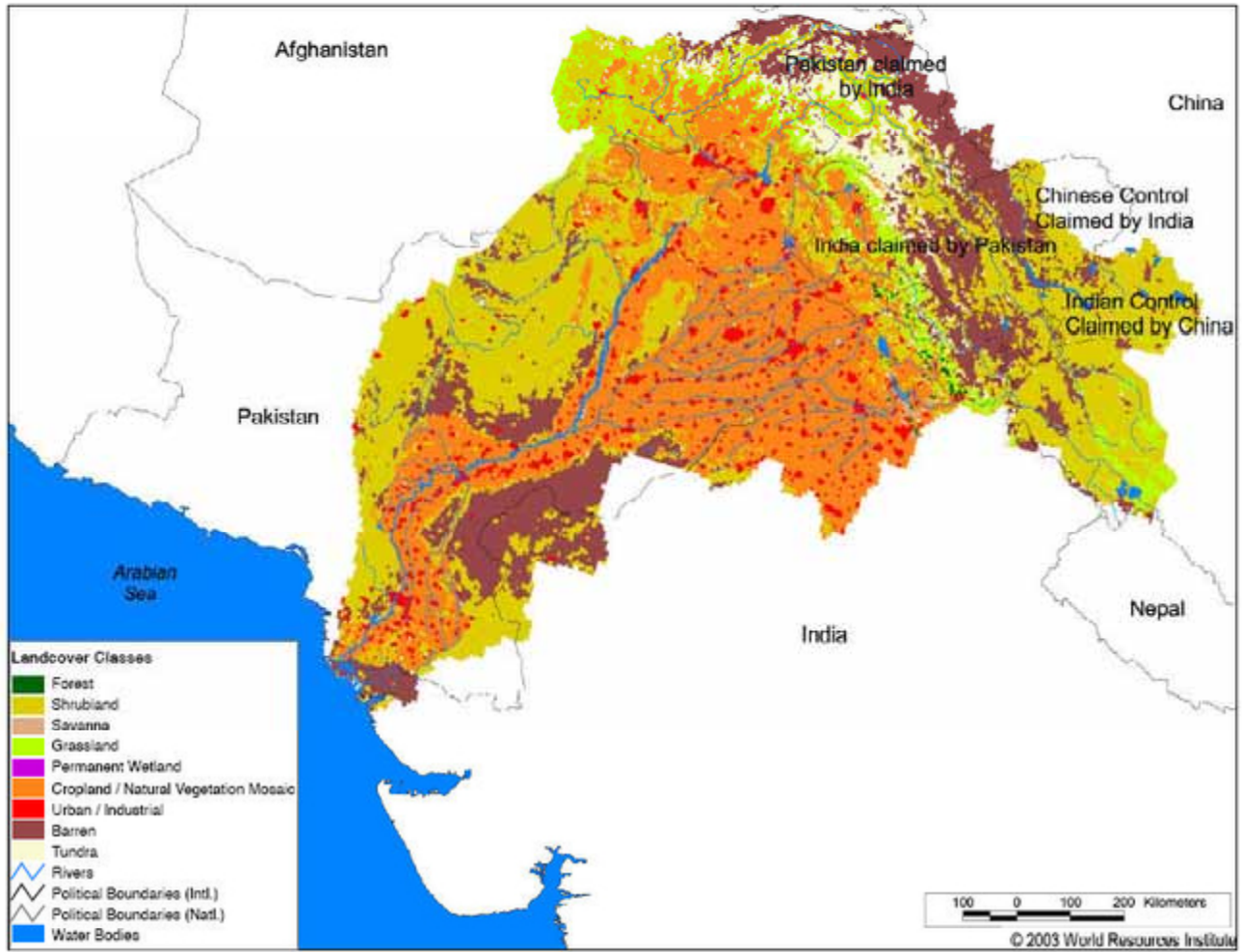




# Water Resources Management in the Indus Basin

# Map of Indus Basin



Afghanistan  
China  
India  
Nepal  
Pakistan



## **The Main Thesis**

**The economic transformation in the Basin states is generating new inter-riparian issues**

**The key drivers of change are states' quest for "national" food and energy security**

**Successful basin management paradigm would recognize and leverage the synergies between food, water and energy security**



## Riparian states are going through economic transformation

<b>GDP GROWTH RATES %</b>					
<b>YEARS \ COUNTRIES</b>	<b>AFGHANISTAN</b>	<b>CHINA</b>	<b>INDIA</b>	<b>NEPAL</b>	<b>PAKISTAN</b>
<b>1981</b>	-	<b>5.20</b>	<b>6.18</b>	<b>8.34</b>	<b>6.83</b>
<b>1990</b>	-	<b>3.80</b>	<b>5.63</b>	<b>4.64</b>	<b>4.46</b>
<b>2000</b>	-	<b>8.40</b>	<b>5.83</b>	<b>6.12</b>	<b>3.91</b>
<b>2010</b>	<b>8.23</b>	<b>10.33</b>	<b>10.09</b>	<b>4.55</b>	<b>3.76</b>
<b>2011</b>	<b>7.10</b>	<b>9.50</b>	<b>7.80</b>	<b>3.50</b>	<b>2.60</b>
<b>PROJECTIONS</b>					
<b>2012</b>	<b>7.20</b>	<b>9.00</b>	<b>7.50</b>	<b>3.80</b>	<b>3.80</b>
<b>2016</b>	<b>9.50</b>	<b>9.50</b>	<b>8.10</b>	<b>3.90</b>	<b>5.00</b>

\*SOURCE : IMF



**Rising per capita income and population generate greater demand for water food and energy**

PER CAPITA GDP (CONSTANT 2000)					
(US \$)					
YEARS \ COUNTRIES	China	Nepal	India	Pakistan	Afghanistan
1992	475.93	186.52	326.63	481.83	-
2000	949.18	225.17	452.97	511.70	-
2010	2425.47	268.26	822.76	668.55	501.47

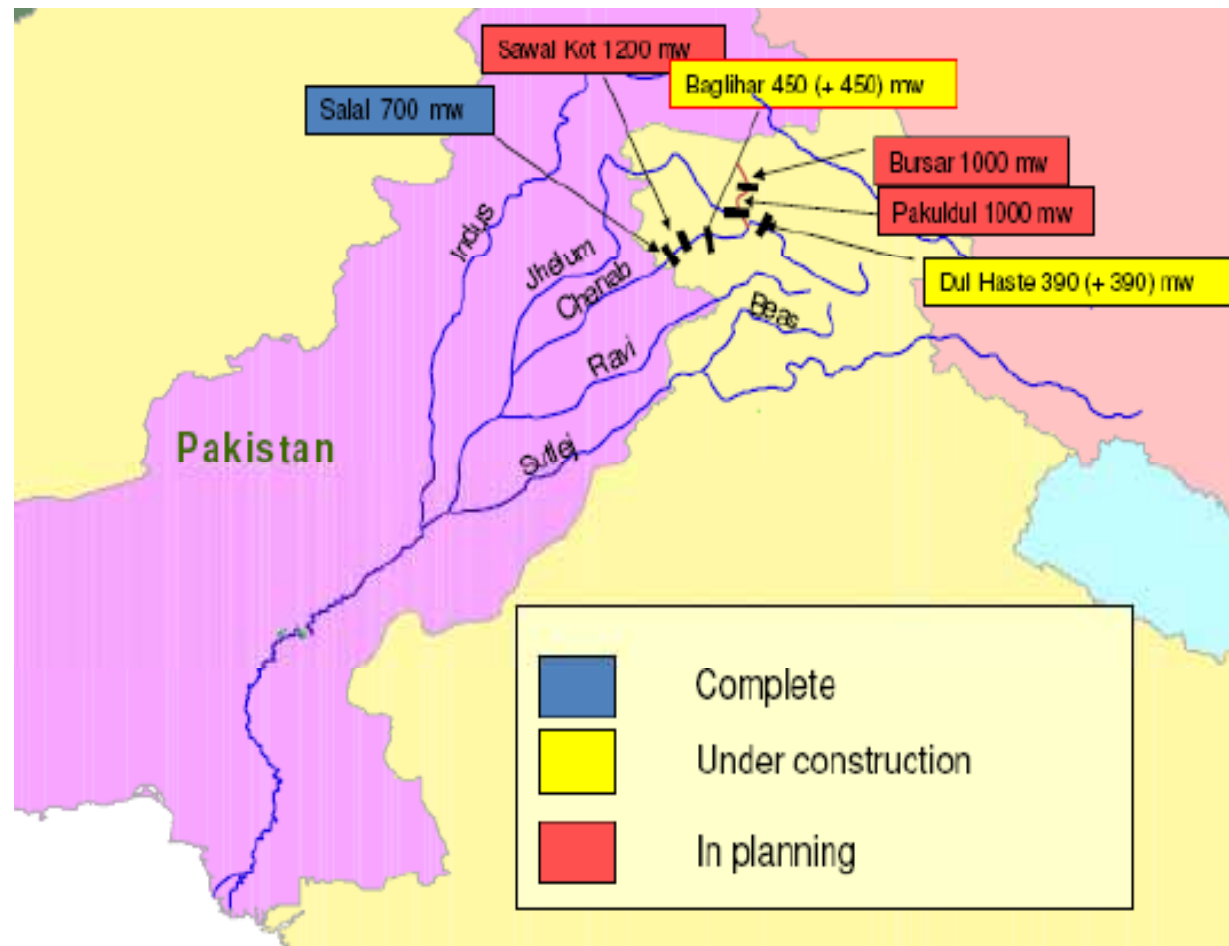
POPULATION GROWTH RATES (%)					
YEARS \ COUNTRIES	Afghanistan	China	India	Nepal	Pakistan
1992	3.39	1.23	1.86	2.47	2.61
2000	2.92	0.79	1.68	2.39	2.28
2009	2.83	0.51	1.34	1.81	1.81



## Total Primary Energy Consumption per Dollar of Gross Domestic ( Btu per (2000) U.S. Dollars)

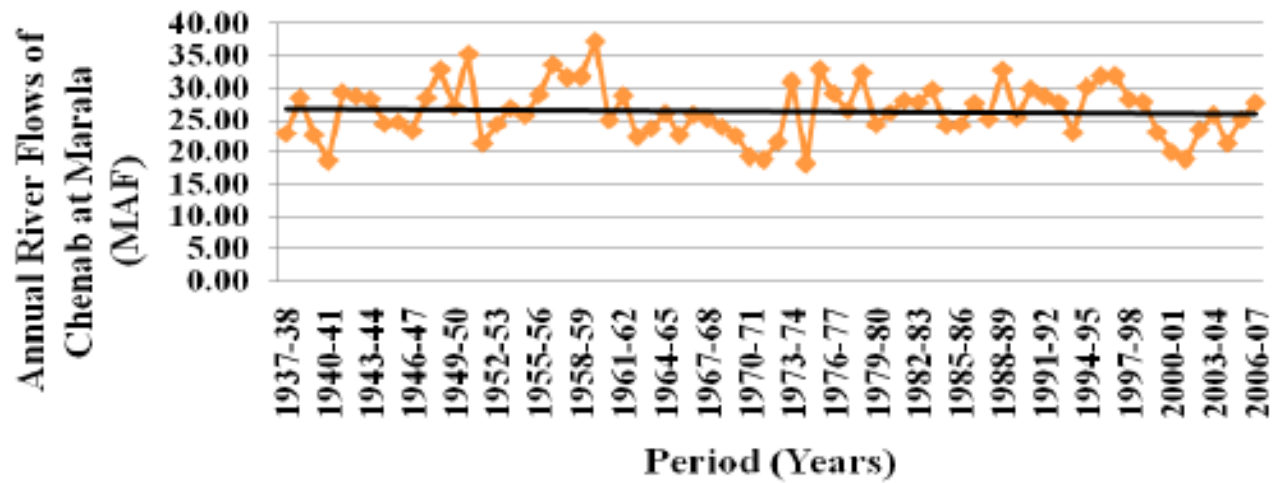
Region/Country	1980	1990	2000	2005
Afghanistan	22,787	153,141	25,115	11,131
China	94,498	60,726	31,022	35,283
India	25,909	28,767	28,778	24,961
Nepal	3,863	5,479	10,876	11,051
Pakistan	24,170	24,489	26,244	24,956
Japan	5,410	4,519	4,805	4,566
Asia & Oceania	12,413	11,930	12,553	14,420

## Water Resources Development in the Upper Indus Basin





## Annual flows of Chenab River



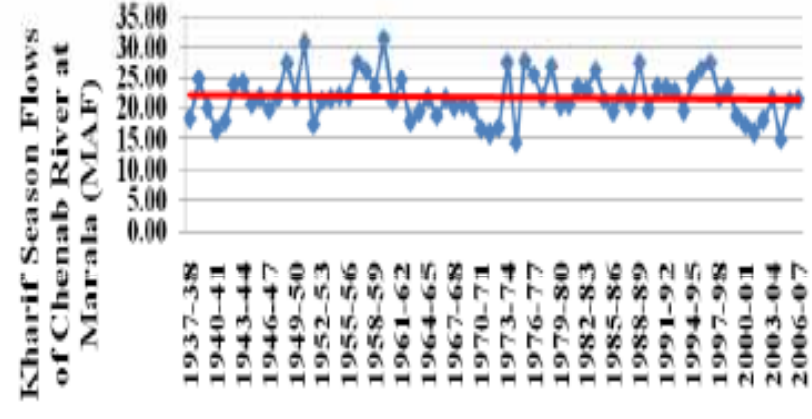
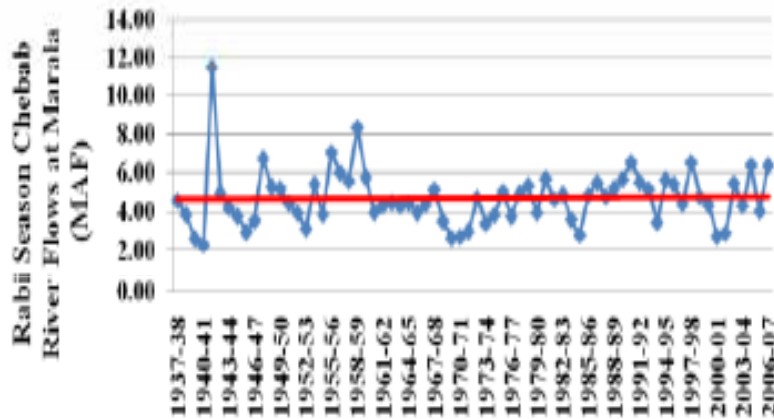




## Rabi season flows are critical for food security

Wheat the most important food staple in Pakistan depends on Rabi irrigation

Rabi season flows



Rabi flows average around 4-5 MAF only



## Pakistan is both an upper and a lower riparian on Kabul River

River Konar – a tributary of River Kabul – originates in Pakistan





## **Significant water resources development on Kabul River is expected**

Trans-boundary water management issues would need to be resolved

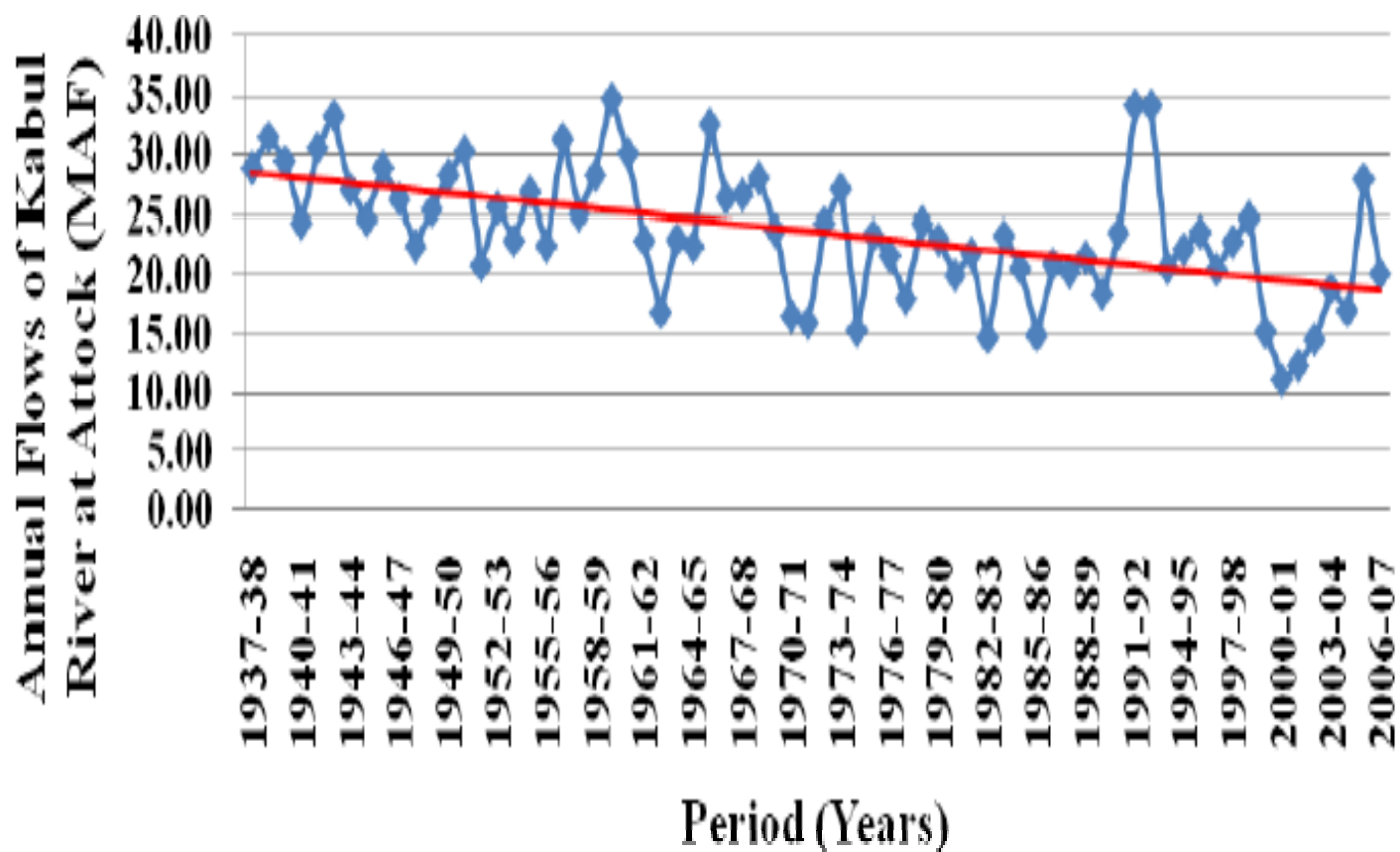
### **Water infrastructure in Afghanistan is in planning stages:**

The strategic vision for the water sector aims to “manage and develop water resources so as to reduce poverty, increase sustainable economic and social development, and improve quality of life for all Afghans and ensure an adequate supply of water for future generations”

(Afghan National Development Strategy, 2008-2013)



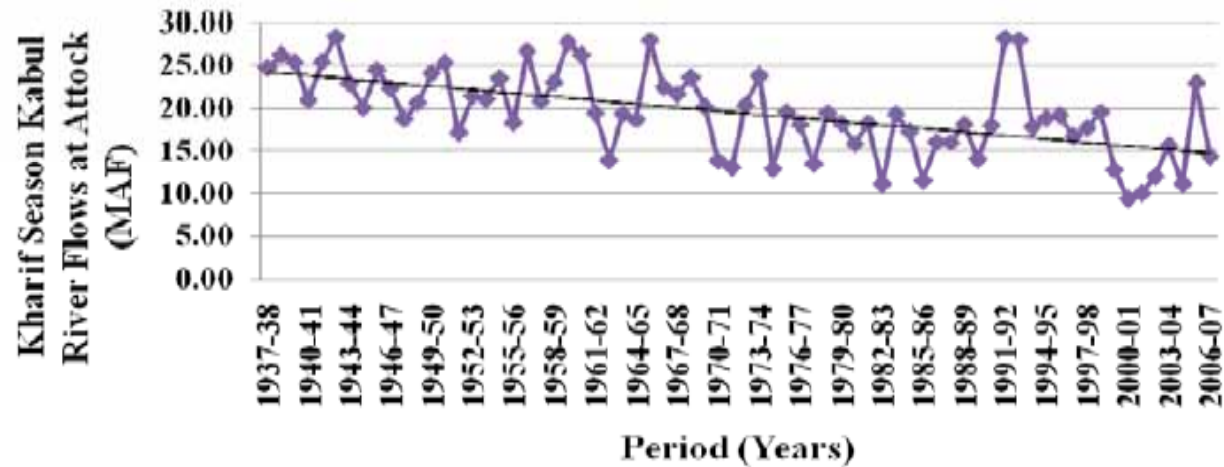
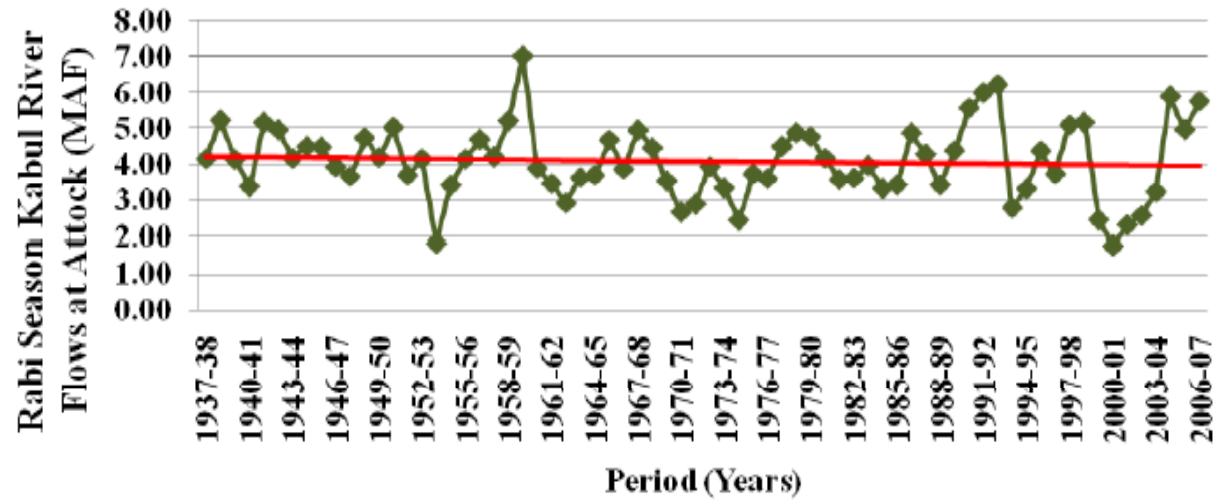
## Secular decline in Kabul River flows: climate change or greater upper catchment uses?



Source: IUCN, 2010. Towards Kabul Water Treaty: Managing Shared Water Resources – Policy Issues and Options.



## Decline is more pronounced in Kharif season



Source: IUCN, 2010. Towards Kabul Water Treaty: Managing Shared Water Resources – Policy Issues and Options.



## **Ties that bind**

**In future there are expected to be growing reciprocal dependencies among riparian the states**

**These interdependencies would involve**

**Food security**

**Water security**

**Energy security**



## Pakistan is a significant contributor to Afghanistan's food security

Pakistan's Revealed Comparative Advantage in Afghanistan's market  
Modified Balassa Index

SITC code	Product category	RCA
017	Meat/offal preserved n.e.s.	11.6
022	Milk products excluding butter/cheese	34.9
023	Butter and cheese	29.1
025	Eggs, albumin	18.4
041	Wheat/meslin	17.0
042	Rice	2.1
043	Barley grain	29.8
044	Maize except sweet corn	16.0
045	Cereal grains n.e.s.	20.1
046	Flour/meal wheat/meslin	33.2
047	Cereal meal/flour n.e.s.	9.9
048	Cereal etc flour/starch	4.4
054	Vegetables, fresh/chilled/frozen	4.0
058	Fruit preserved/fruit preparations	3.9
059	Fruit/vegetable juices	9.6
05712	Mandarins etc fresh/dried	1.7



## In future the Basin states may be have growing and Multi-faceted interdependencies

Proposed Turkamenistan-Pakistan-India pipeline



**The proposed TAPI gas pipeline**



## Iran-Pakistan-India Natural Gas Pipeline Route





## Vision for the future

Many trans-boundary water resources issues arise as states Endeavour to achieve each of the three objectives of food, water and energy in isolation from the other riparian states

Successful water resources management, especially resolution of trans-boundary issues would depend on leveraging synergies between the three types of security that the basin states aim to achieve

## **Some specific initiatives for future**

**Put in place mechanisms for sharing hydrological information between riparian states**

**Set up Indus Basin Commission involving all Riparian states**

**Start negotiations for a Water Treaty with Afghanistan**

**Simultaneously negotiate details for TAPI and Pak-Afghan Transit trade**

**Engage India in a comprehensive dialogue encompassing trade, energy, and Water**

**Continue on-going CBMs and normalization of relations with India**

**Grant MFN status to India**