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Food Security Challenges – Asia: The Indus Case

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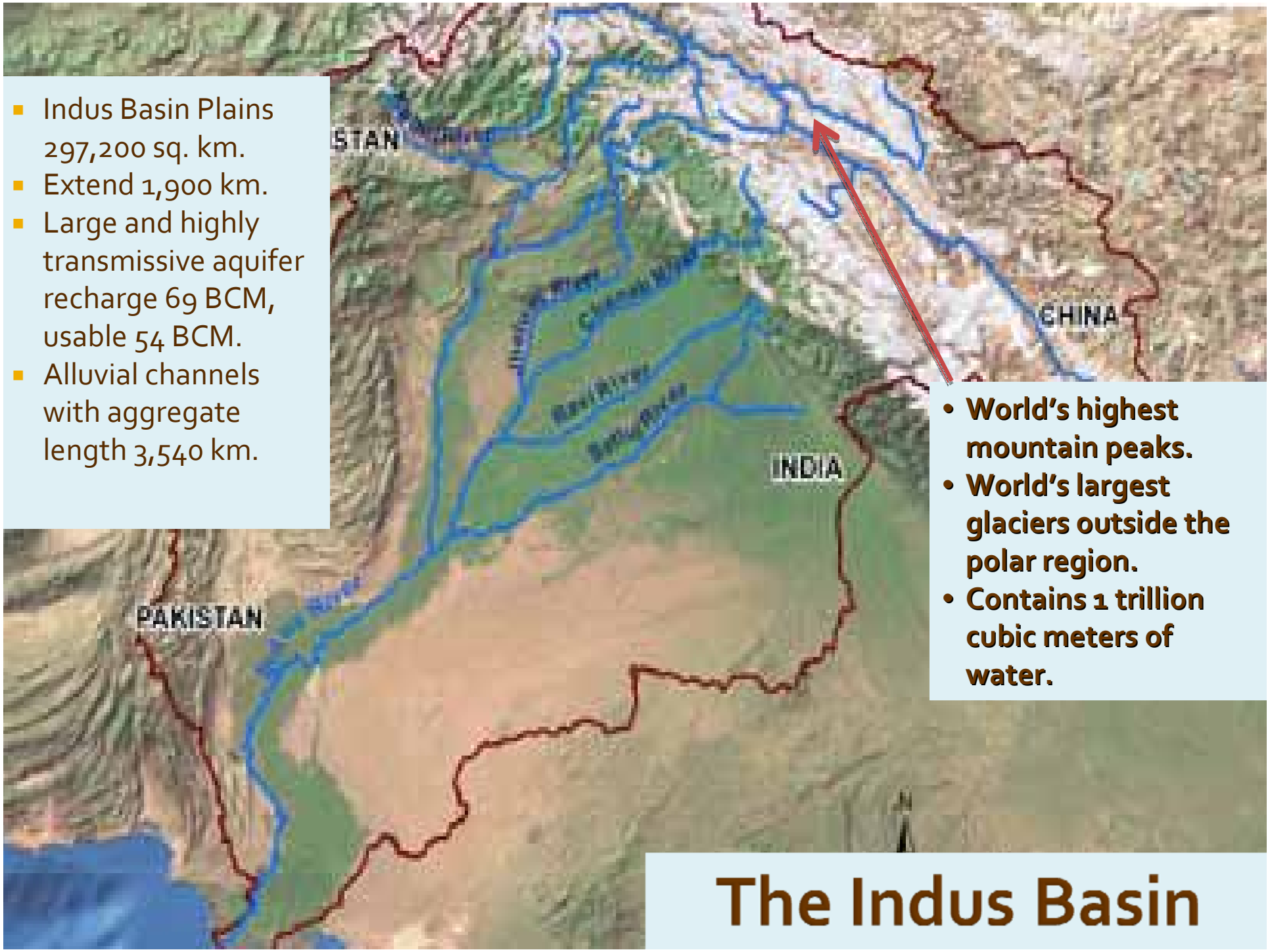

- Indus Basin Plains 297,200 sq. km.
- Extend 1,900 km.
- Large and highly transmissive aquifer recharge 69 BCM, usable 54 BCM.
- Alluvial channels with aggregate length 3,540 km.

- **World's highest mountain peaks.**
- **World's largest glaciers outside the polar region.**
- **Contains 1 trillion cubic meters of water.**

The Indus Basin

Water and food security challenges

Prior to Indus Waters Treaty

- Water security prior to the Indus Waters Treaty was threatened.
- Agro based economy was at the verge of collapse.
- Country faced frequent famines.
- High financial burden to import food.
- Week nexus between water, food and energy.

Water and food security challenges

Post Treaty Related Challenges

- Major Hydraulic Shock - water availability in the west and irrigated area, the food basket of Pakistan in the east.
- Massive inter-river hydraulic works to transfer water from west to east.
- This drastically altered the natural flow, rivers were confined within narrow channel.
- Sediments which previously nourished the delta were trapped.

Water and food security challenges

Post Treaty Related Challenges (contd….)

- Water level rose to the surface, resulting in twin menace of water logging and salinity.
- With eastern rivers given to India, water availability prior to Indus Water Treaty of 5,650 m^3/p/y declined to 3,500 m^3/p/y.
- Massive infrastructure developed on rivers, resulted in serious structural safety risks and perpetual huge O&M costs.
- Strong nexus was created between water, food and energy.

Post Treaty

- Strong nexus was created between Water, Food and Energy:

Water ⟶	Food ⟶	Energy

• Skewed water availability corrected from 80% (summer) to 20% (winter) to 60% and 40% respectively.
• Storages helped transfer 20 BCM from summer to winter.
• Better water regulatory control.
• Groundwater supplements water supply by providing 50% of irrigation water.
	• Irrigated area increased from 10.75 Mha to 18 Mha.
	• Productivity increase
	  • Wheat from 12.5 MT to 24.2 MT (94%).
	  • Rice from 3.3 MT to 6.9 MT (109%).
	  • Sugarcane from 33.1 MT to 55.3 MT (67%).
	  • Cotton from 6.3 M. Bales to 14.3 M. Bales (130%).
	  • Vegetables and fruits being exported.
		• Hydropower increased from 119 MW to 6,720 MW.
		• 3,000 large industries electrified.
		• Tube wells electrification.
		• Village electrification increased from 607 to 137,756 villages .
		• Consumers increased from 311,596 to 18,671,114.

Future Food Security Challenges

- No additional water available – Indus Basin is a single basin.
- Large quantities of salts influx into the basin and rapid sedimentation of storage reservoirs would degrade land quality and reduce water availability & would affect productivity adversely.
- Rapidly growing population is a serious threat to the water, food and energy security.
- Global warming and climate change could reduce flows to the basin's rivers by 30 to 40% as a result of retreating glaciers which presently contribute 70% to the rivers flows.
- The existing 16 agro-climate zones would need redefining and drastic changes in cropping pattern.

Combined Basin Potentials – India and Pakistan

- Total Water Availability - 247 BCM
- Hydropower Potentials - 93,628 MW
- Hydropower Developed - 16,649 MW (18%)
- Irrigated Area (India+Pakistan) - 73 Mha
- Increase water use efficiency can save upto 50% of water.
- Large potential for productivity enhancement per unit of water and land.

Way Forward
Transboundary Initiatives

- Joint monitoring and data sharing – climate change impacts, glacier melt and monsoon pattern change.
- Transboundary flood and drought management.
- Joint research on enhancing food productivity.
- Joint investment in developing energy resources of the basin.
- Joint efforts in water use efficiency plans.
- Initiating transboundary energy sharing agreements.
- Creating a strong cross-border nexus of water, food and energy.
- Vigorously following the Track-II Diplomacy to address common basin challenges.

THANKYOU!

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