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Promoting Environmental Flow Management in Asian Rivers: Policy, Cases, and Lessons

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The logo of the Asian Development Bank (ADB) is located in the bottom right corner. It consists of the letters "ADB" in a white, serif font, centered within a dark blue square background.

Talk Outline

- ADB *Water for All* Policy
- Water Challenges in Asia and ADB's Responses
- ADB Supported Cases on Environmental Flow Management
- Lessons Learned

ADB Water for All Policy

- Manage water as a resource
- Deliver water as a service
- Focus on reforms and governance

Water Challenges in Asia

- Competition for water is increasing due to continued population growth, and rapid economic development and urbanization
- Climate change is creating more uncertainty
- Need for environmental reserves and flows
- Changes in governance and capacity development

ADB Response to Challenges

- *Strategy 2020*—ADB's long-term strategic framework
- Water Financing Program for 2006–2010
- Asia Pacific Water Forum and Water Knowledge Hubs
- Network of Asian River Basin Organizations
- Climate Changes Funds

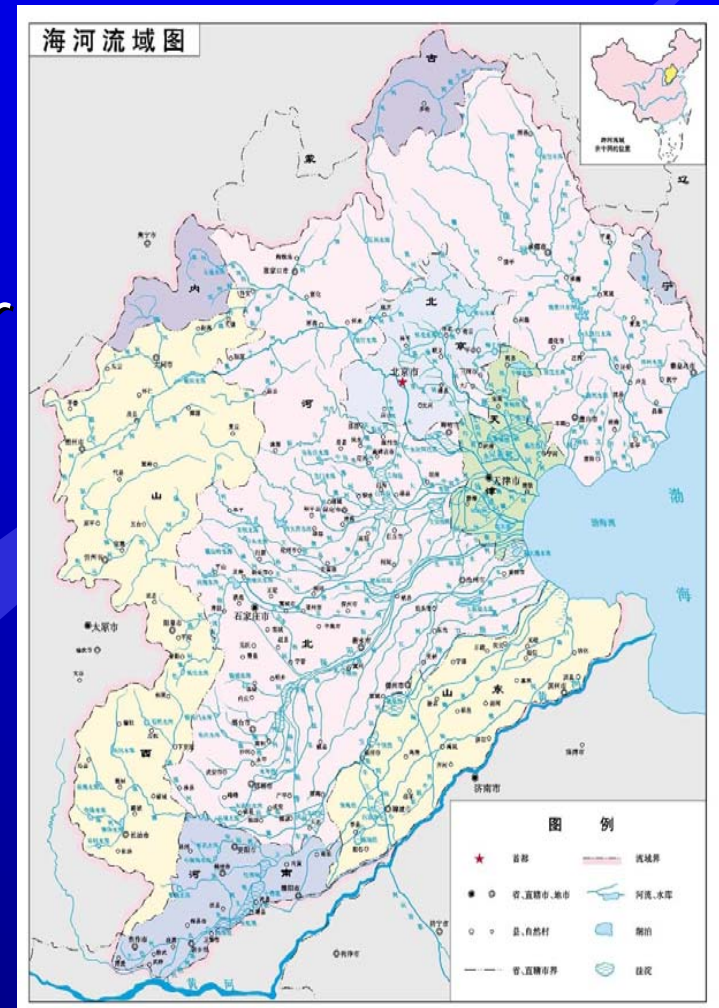
ADB-Supported E-Flow Cases

Features

- Across countries in the region, and promoting regional cooperation
- Promoting integrated approach
- Results-oriented
- Policy advice, framework/strategy, and investments through technical assistance and loans

People's Republic of China (PRC): Hai River

- TA 3963: study of the carrying capacity of water resources
- Developed a methodology for planning to maximize benefits for man and nature
- Determine the environmental condition, its acceptable levels, water requirements, socio-economic development and its relation to water, and trade-offs

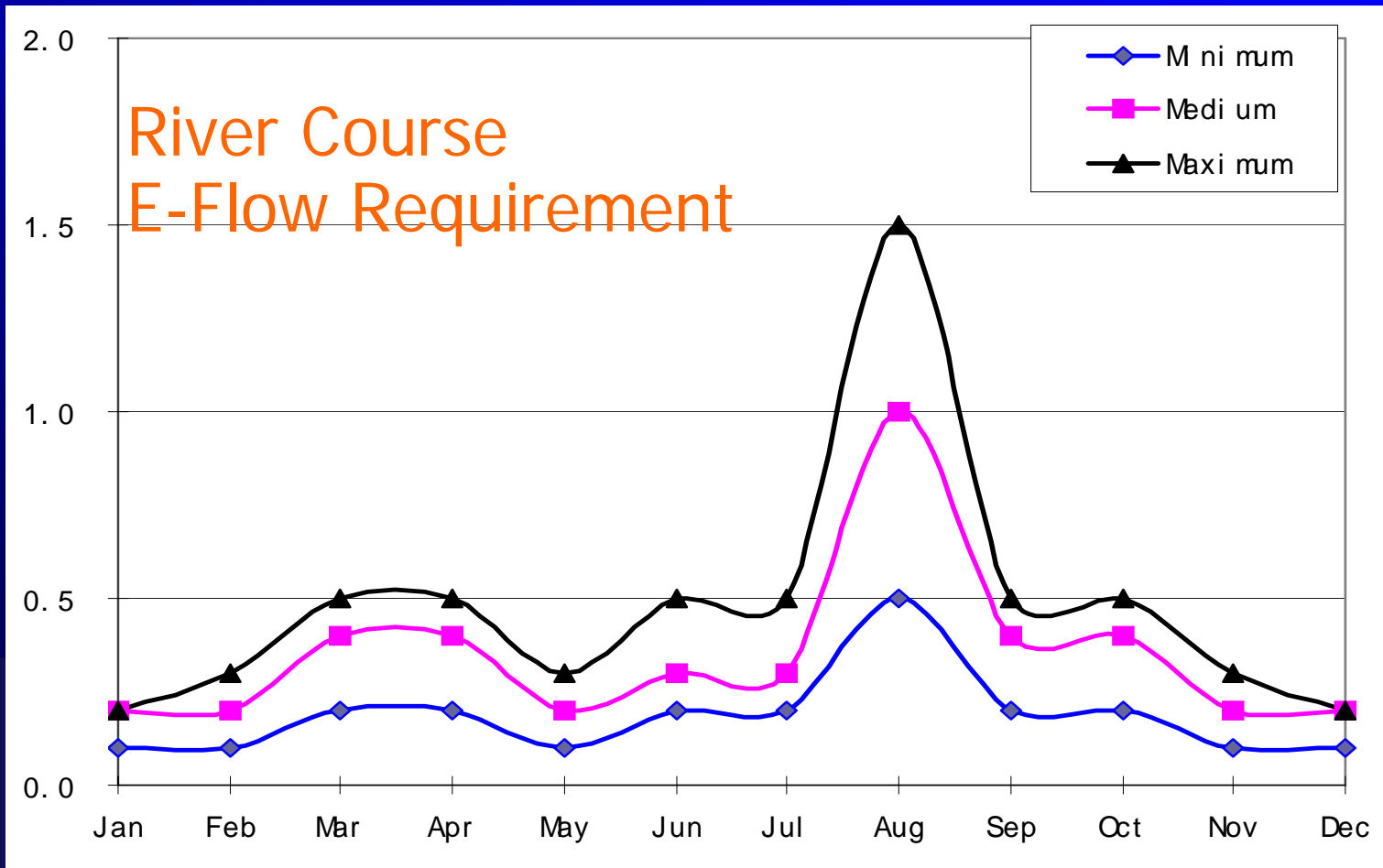


PRC: Hai River

- Environmental flow requirement levels
 - high, medium, low
- Evaluating environmental conditions
 - Water quality index developed for the basin
 - Level of environmental flow + water quality index
- Ecological areas studied
 - river course, wetland, and estuary with different environmental targets

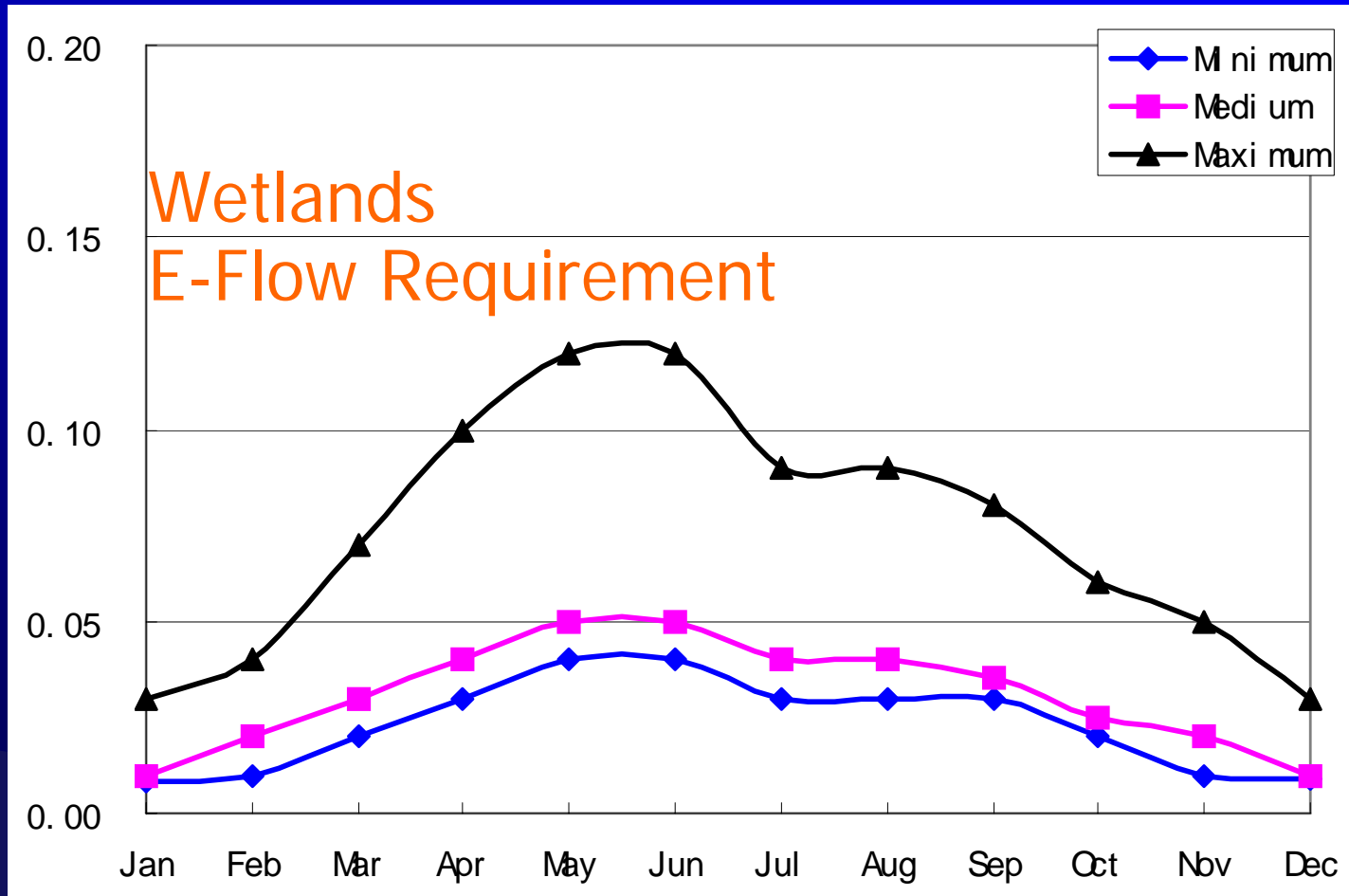
PRC: Hai River

(100 million m³)



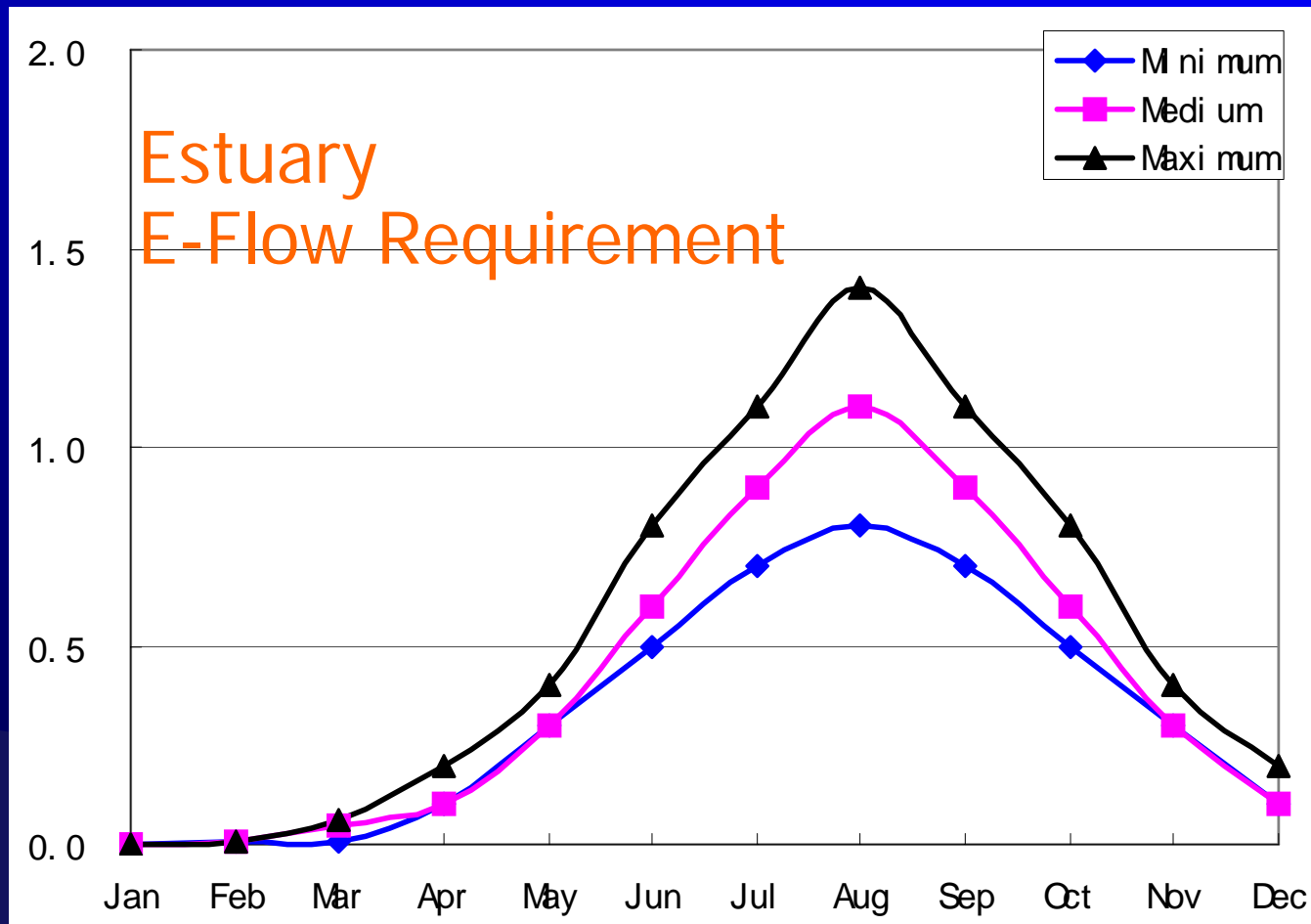
PRC: Hai River

(100 million m³)



PRC: Hai River

(100 million m³)



PRC: Yellow River

- TA 3708: Strategic planning study for the preparation of the Yellow River Law
- Prepared a draft Yellow River Law for integrated river basin management (IRBM)
- E-flow as integrated part of river basin management plan
- E-flow management defined in the draft law



PRC: Yellow River

E-flow Management Program

- Legal measures + public consultation
- Enforced Water Allocation Scheme
 - 58 billion cubic meter = 37 + 21 billion cubic meter (e-flow)
- Artificial floods to flush river sediments and improve river morphology

PRC: Yellow River

- E-flow Calculation
 - Water for river ecosystem (fishes, etc.)
 - Water for self-purification
 - Water for transporting water and sediment
 - Water for wetlands
 - Balance of available water and economic/human demand + E-flow

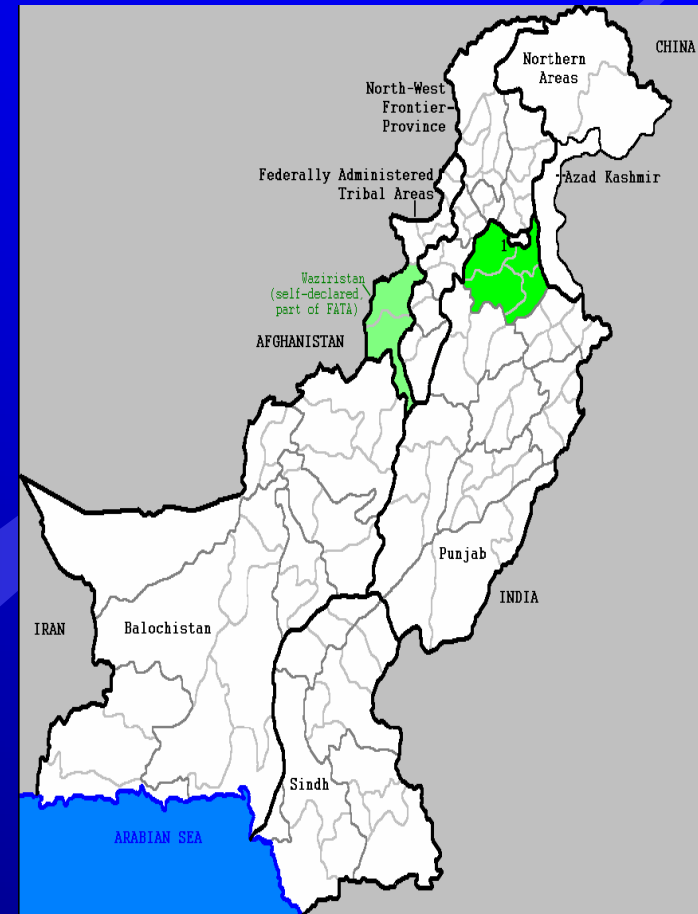
PRC: Yellow River

Some Improvements

- No dry-up since 2002 through enforced water allocation regime and artificial sediment-flushing program
- No further delta wetland shrinkage
 - increased by 20%
- Some valuable fishes appear again

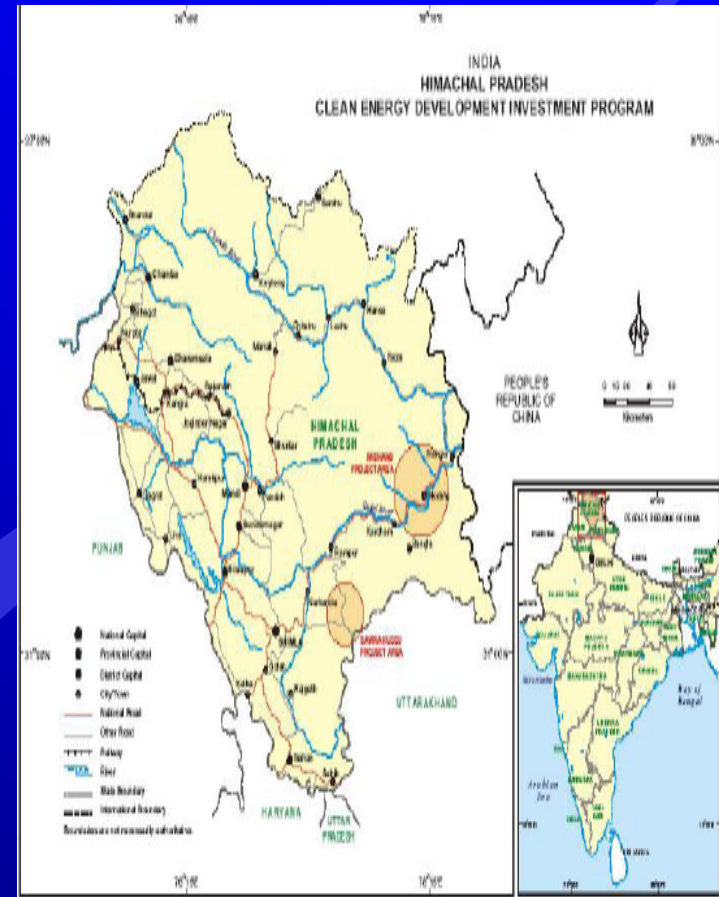
Pakistan: Barani IWRM Sector Project (Loan 2412)

- Dam operational guidelines require an e-flow, and 500 l/s to be maintained
- Each subproject considers ecological water demand with appropriate project design in allocation of water resources
 - a minimum of 10% of existing flows must be maintained as e-flow



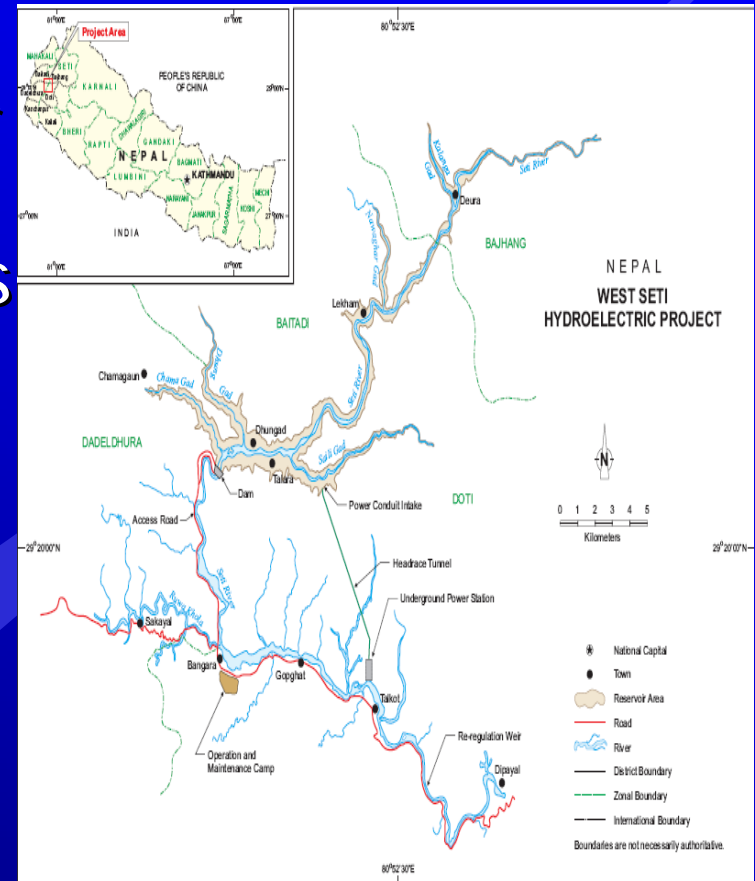
India: Himachal Pradesh Clean Energy Development

- Provision for 15% (or 1.27 m³/s) of e-flow even during the dry season
- Plus 3.53 m³/s from other streams, a total lean season discharge of 4.8 m³/s available to the local downstream villages
- An electronic flow-measuring device to be installed to monitor downstream discharge



Nepal: West Seti Hydroelectric Project

- A base e-flow of 4 m³/s
 - provide sufficient water of acceptable quality for essential non-potable uses
 - support a substantially reduced and highly modified aquatic ecosystem, while minimizing the reduction in stored water available for generation in the main power station



RETA 6470: Managing Water in Asia's River Basins

- Demonstrate good practices in introducing IWRM in river basins in Asia
- Four components
 - project development facility, country performance assessments, river basin organization knowledge service, and performance improvement
- A road map advisory service to be developed and piloted in five river basins across the region
 - e-flow management will be included in the road map

Lessons Learned

- Need to promote understanding of the e-flows as a concept and a tool, relating to socio-economical issues
 - ecosystem services have real economic value
- New thinking is needed to manage e-flows within the broad framework of IWRM
 - think “outside the box”
 - conduct “business unusual”

Lessons Learned

- Need to build enabling environment for e-flow management
 - developing legal framework for e-flow management including detailed guidelines, rules, and regulations
 - improving river planning
 - developing decision support information
 - transparent and participatory process of implementation
 - capacity to implement

Lessons Learned

- Ensuring compliance/law enforcement and providing incentives are very important
- Upstream–downstream/among-sectors dialogue is key
- Long-time process and requires tremendous efforts

Are We Ready for E-Flow Management?

- How to mainstream e-flow management into IWRM, national policies, river basin and local regulations?
- How to convert various studies (definitions and methodologies) into practical and simple tools to define and manage e-flow?
- What are the roles of academics, river basin organizations, policy makers, and civil society in promoting e-flow management? How to effectively engage them?

Thank you

For more information, visit
www.adb.org/water



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