APPLYING ECONOMIC AND MARKET-BASED INSTRUMENTS FOR WATER RESOURCES MANAGEMENT

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Sustainable Financing for Nature Positive Investments: Tools for Integrating Economic and Market-Based Instruments into Projects

A case of Vietnamese Environmental Law

Law on Environmental Protection 2014

Nov 2020: Passed
Feb 2022: In force

New Law on Environmental Protection

Chapter 11: Environmental Technical Regulations, Environmental Standards

Article 148 on Environmental Protection Fee

Chapter 8: Environmental Technical Regulations, Environmental Standards

Chapter 11: Economic Instruments, Policies and Resources for Environmental Protection

- Environmental taxes and fees
- Carbon market, permits
- Deposit – refund
- Payment for ecosystem services
- Liability insurance
- Green procurement
- Investing in natural capital
- Green credits and green bonds

Policy instrument framework

Policy Instruments for environmental and natural resource management

- Command and Control
  - Regulations, Standards
  - MPA, National Parks
- Market
  - “Creating market”: Catch quotas, tradable permit, property right transfer, PES
  - “Using market”: Environmental tax/fee, Subsidy, Deposit - refund
- Civil society
  - Behavioral nudges: social comparison, default effects, information framing, collective action
  - Voluntary: ISO, Information provision

Methodology

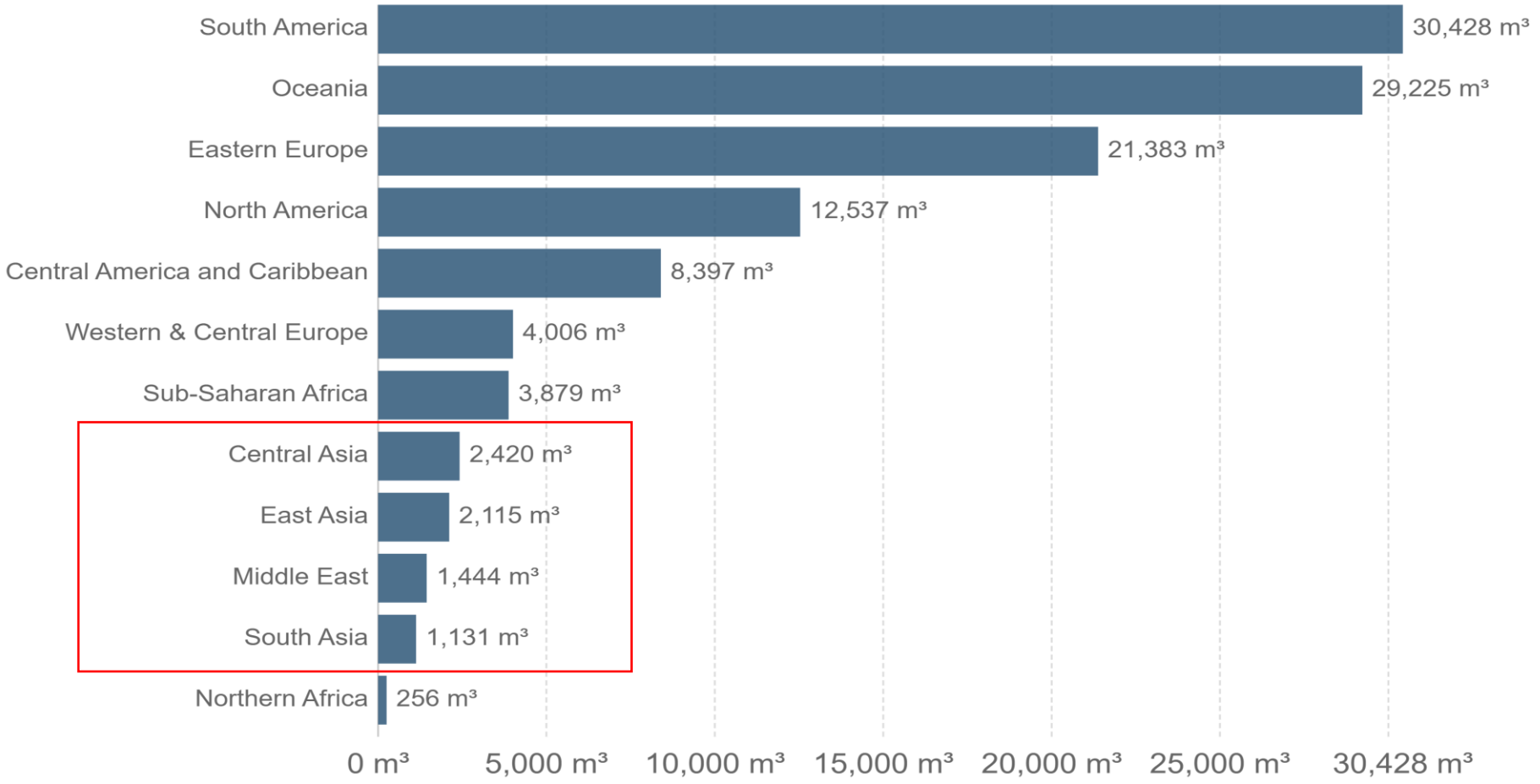
1. Stocktaking of relevant policies in DMCs
2. Systematic review of peer-reviewed journal articles linking policy tools to applications
3. Identifying key applications in water management:
    - Use of irrigation water
    - Intersectoral water allocation
    - Surface water pollution
    - Protection of ecosystems
4. Identifying the economic tools available to policy makers
    - Tradable permits, water market;
    - Taxes, fees, and charges;
    - Subsidies;
    - Payment for ecosystem services; and
    - Information provision and volunrary agreements

4. Analysis of findings and case studies

5. Validation through workshops and peer review

Per capita renewable freshwater resources, 2015

Average renewable freshwater resources per person, measured in cubic metres per person per year. Renewable internal freshwater resources refers to the quantity of internal freshwater from inflowing river basins and recharging groundwater aquifers.



Source: Water resources by continent - FAO AQUASTAT

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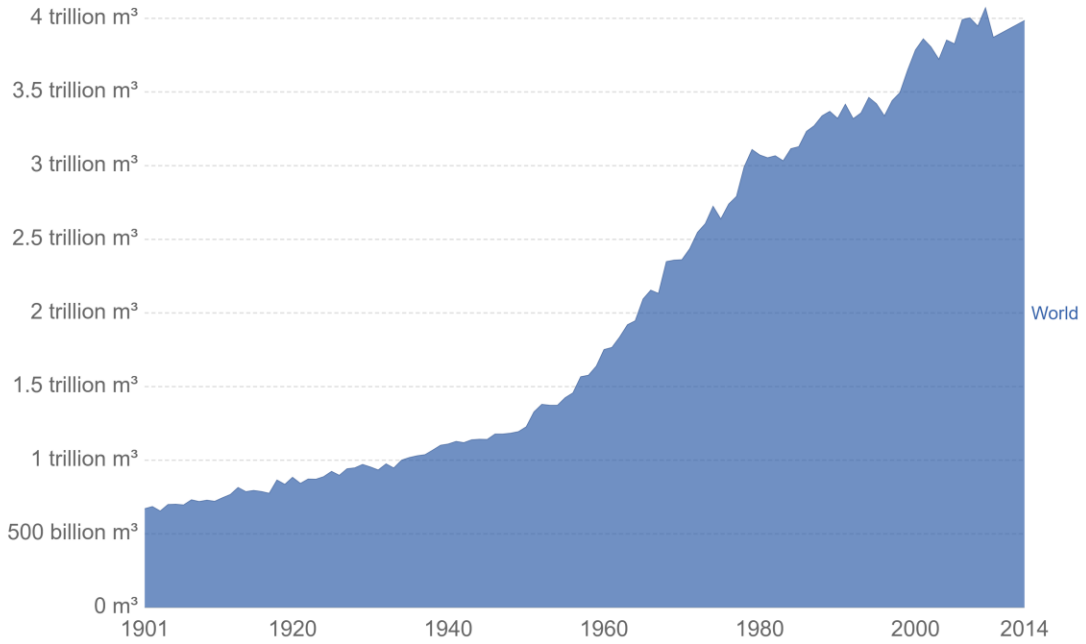
Global freshwater use over the long-run

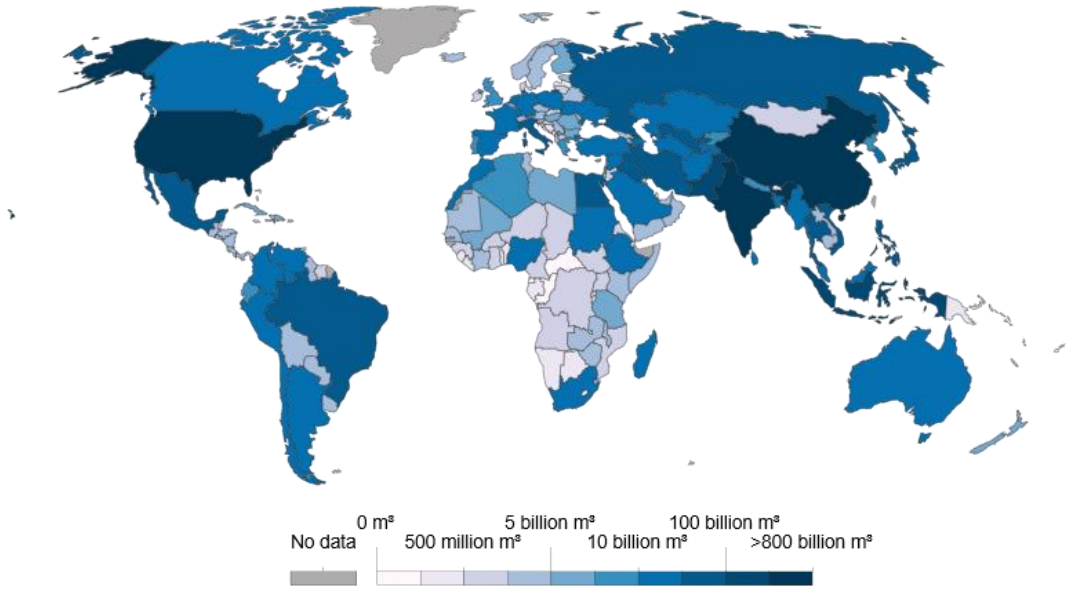
Global freshwater withdrawals for agriculture, industry and domestic uses since 1900, measured in cubic metres (m^3) per year.



Source: Global International Geosphere-Biosphere Programme (IGB) OurWorldInData.org/water-access-resources-sanitation/ • CC BY-SA

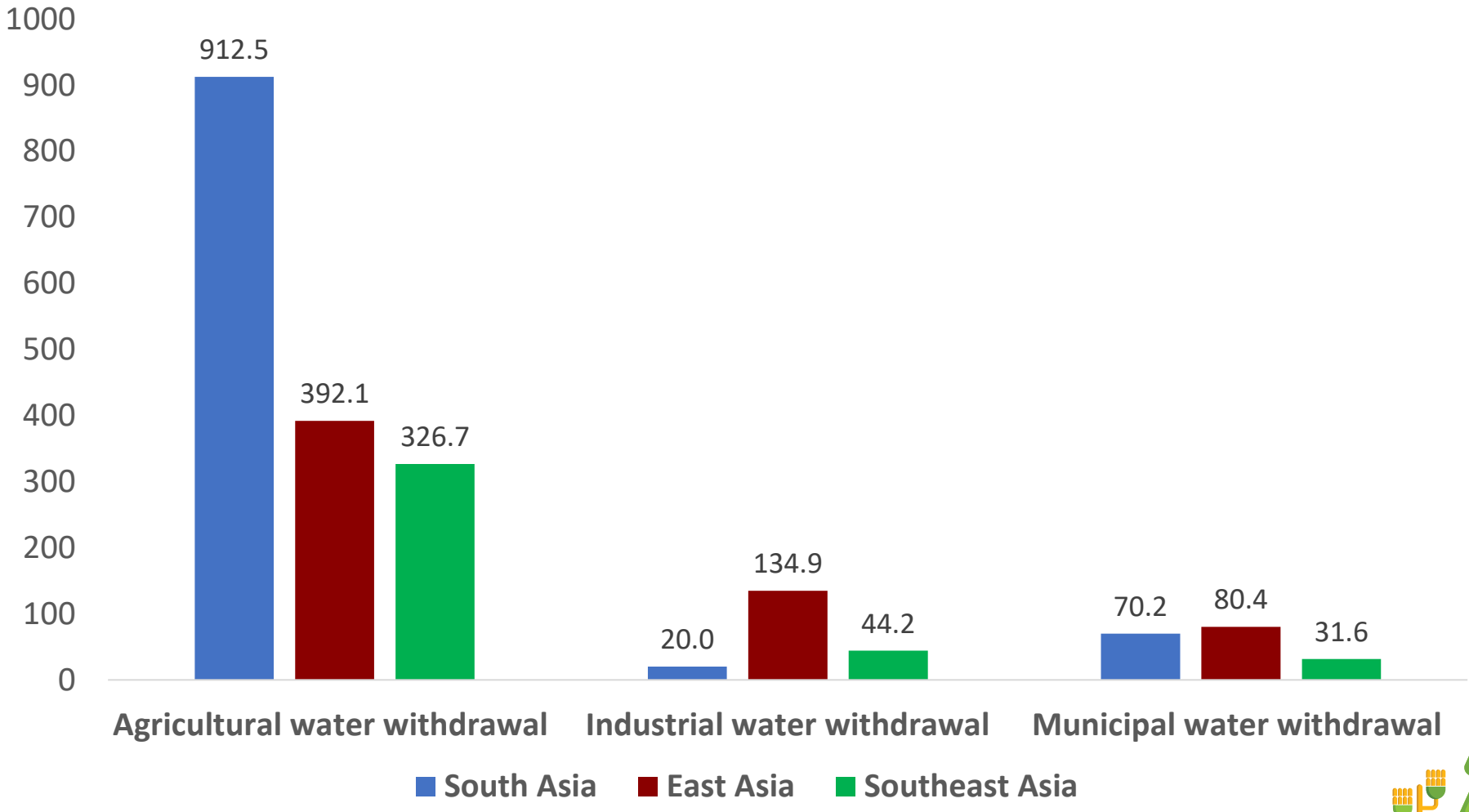
Annual freshwater withdrawals, 2014

Annual freshwater withdrawals refer to total water withdrawals, not counting evaporation losses from storage basins, measured in cubic metres (m^3) per year. Total water withdrawals are the sum of withdrawals for agriculture, industry and municipal (domestic uses). Withdrawals also include water from desalination plants in countries where they are a significant source.

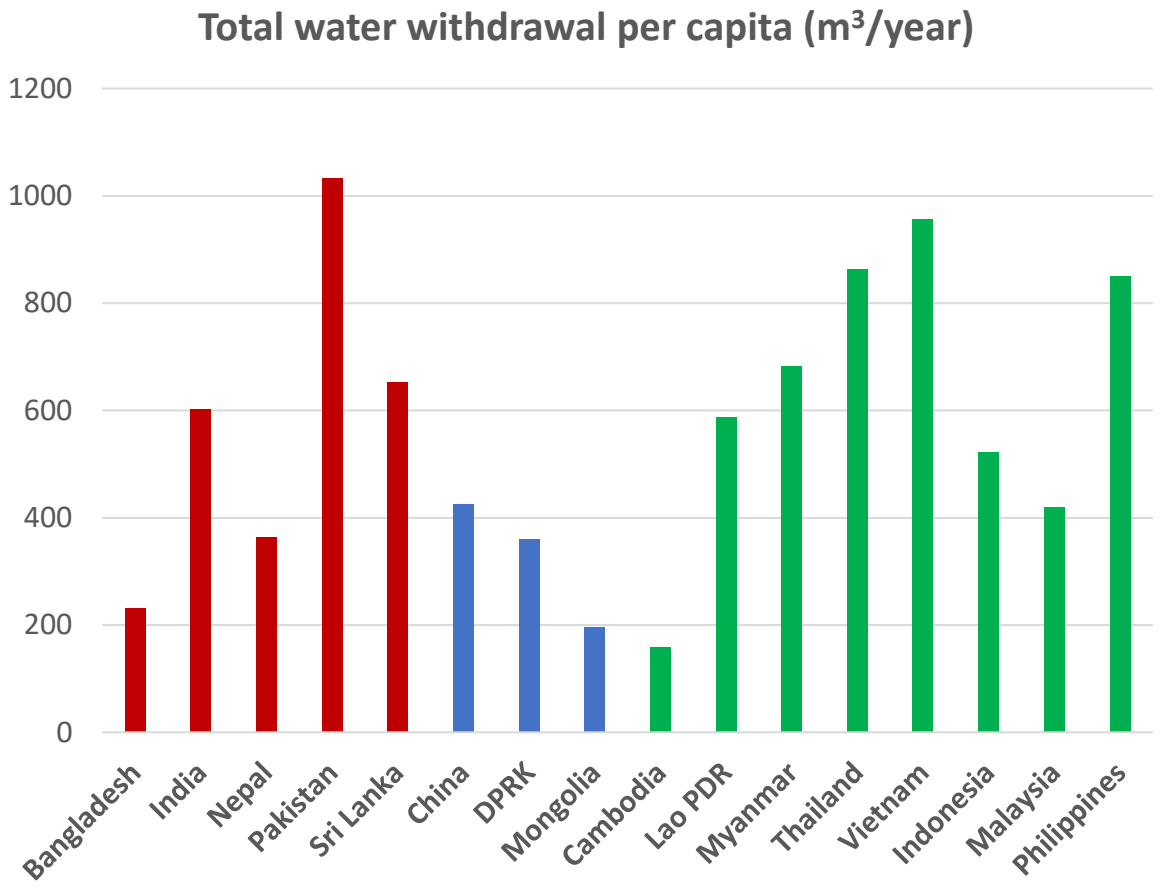


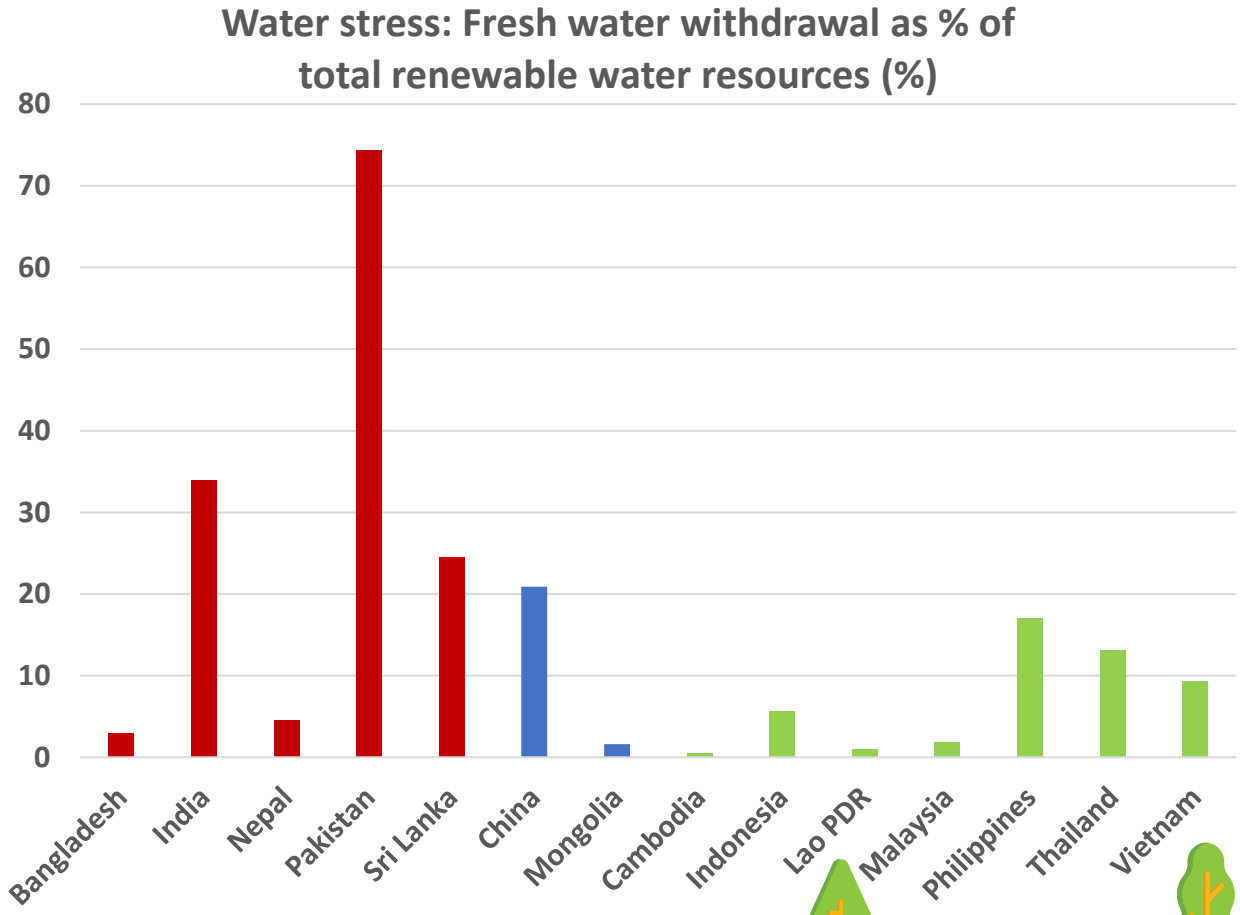
Source: World Bank – WDI OurWorldInData.org/water-access-resources-sanitation/ • CC BY-SA

Water withdrawal by sector in Asia (bil. m^3/year)

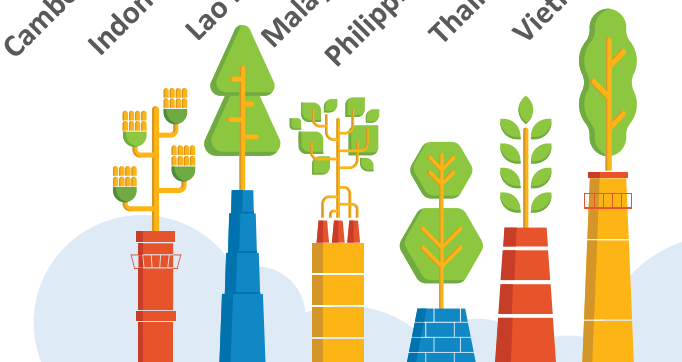


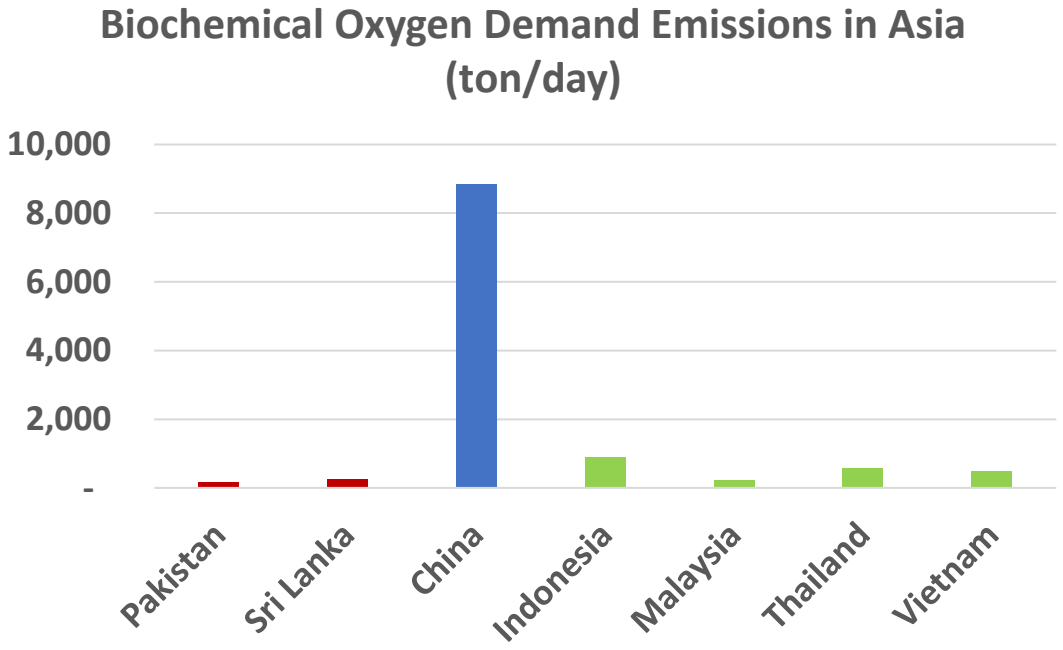
Large scale irrigation threatens ecosystems, water availability, and water quality

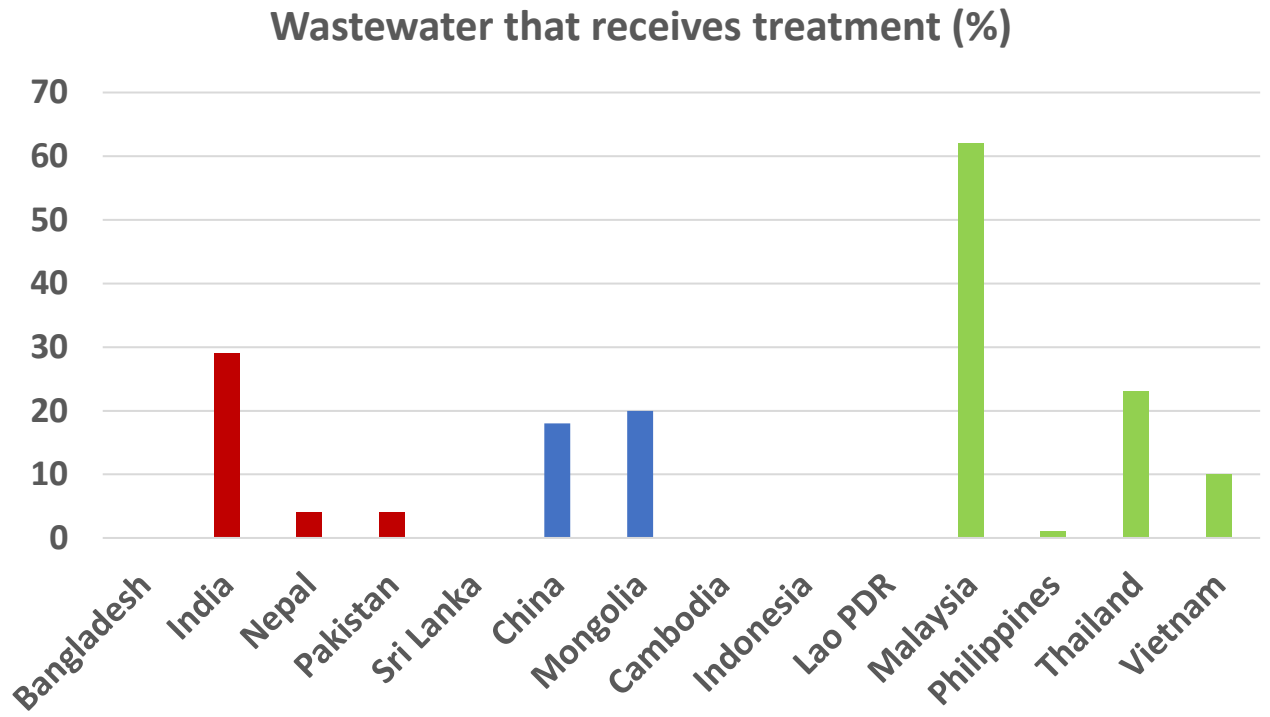




High water withdrawal is leading to water stress in many Asian countries







Poor surface water quality has become a serious environmental and public health issue

Overview of Market-based instruments for water management in Asia

Market-Based Policy Instrument	Inefficient Use of Irrigation Water	Poor Intersectoral Water Allocation	Surface Water Pollution	Failure to Protect and Value Ecosystems
Water markets, tradable discharge markets	Bangladesh, India, PRC	India; PRC; Taipei,China	PRC	Philippines, PRC
Taxes, fees, or charges	Bangladesh, Cambodia, India, Lao PDR, Nepal, Pakistan, Philippines, PRC	Sri Lanka	Malaysia, Philippines, PRC, Thailand, Viet Nam	Bangladesh, Indonesia, PRC
Subsidies	Bangladesh, India, Pakistan, Viet Nam		India, Indonesia, PRC, Sri Lanka	
Payments for ecosystem services				India, Indonesia, Philippines, PRC, Thailand, Viet Nam
Information provision, labels, and voluntary agreements			Indonesia, India, Philippines, PRC, Viet Nam	

Irrigation water

- Area-based pricing:
  - Widely used in Asia
  - Low information requirement and regulatory burden
  - Low price → productivity of water is low and inefficient
- Volumetric pricing:
  - Pilot in China, India
  - Mixed results:
    - Water fees increase water efficiency. It can pair with subsidies
    - Effective pricing policies requires political feasibility
    - Price increase may lead to increase in groundwater usage
  - Lessons learned: a hybrid MBI of electricity and water pricing can work

Inter-sectoral and inter-regional water allocation

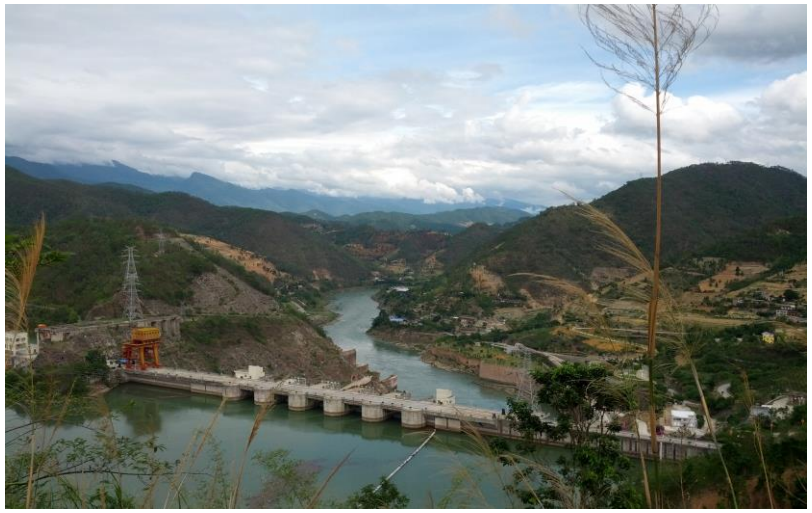
- Water market:
  - Water use rights system with tradable water quotas
  - Only 1-3% of annual water rights were traded
  - Barriers: unclear legal foundations, insufficient incentives for water saving and trading, high transaction costs, and corruption
  - Equity implications for smallholders
- Enabling conditions for water market:
  - Well-defined quantifiable, and transferable property rights
  - Able to unbundle water flows, e.g. water rights for ecosystem purposes

Surface water quality

- **Effluent charges:**
  - Widely used in Asia
  - Enabling conditions*:* sufficient information on environmental cost and abatement cost, strong enforcement, public support
  - Lessons learned: mixed results
- **Nutrient tax for water pollution in agriculture:**
  - Lesson learned: Nutrient taxes can be used to reduce pollution
  - Asia: Fertilizer subsidies, not use nutrient tax
- **Information disclosure:**
  - Widely used in Asia: PROPER-Indonesia, Industrial EcoWatch- the Philippines, Green Rating Project in India and GreenWatch-China.
  - Enabling conditions*:* strong regulatory capacity, public support
  - Lessons learned:
    - Significant reduction in water pollution
    - Complementary to effluent charge and CAC
- **Tradable discharge permit:** Piloted in China. Lessons learned:
  - Information requirements and regulatory complexity discourage governments and firms' efforts
  - The permit requires a strong regulatory framework and monitoring infrastructure to be effective

Ecosystem values for water retention and purification

- **Payment for ecosystem services:**
  - China, India, and Southeast Asia (Indonesia, Philippines, and Vietnam), mainly for watershed protection
- **Eco-compensation in China**
- **Lessons learned:**
  - Promising results for environmental performance but gaps in terms of social gains
  - *Informational requirements and regulatory burden*: huge!
  - *Political feasibility*: public support but need to persuade payers
  - *Static efficiency*: Questions about cost-effectiveness, high transaction costs
  - *Efficacy*: Impacts on business environment or poverty reduction have remained unclear



Conclusions and low-hanging fruits

1. MBIs can be cost-effective tools to promote efficient water use and reduce water pollution.
2. In practice, MBIs in the water sector in Asia have often suffered from poor design, implementation, and monitoring and enforcement.

Water use

Behavioral nudges can complement MBIs to influence decision-making on **water use**

- Social comparison messages (Ferraro and Price 2013; Torres and Carlsson 2016);
- Information provision on water quality (Brown et al. 2017);
- A combination of technical information, moral persuasion, and social comparison (Bernedo et al. 2014);
- Social norms (Datta et al. 2005); and
- Education campaigns (Szabó and Ujhelyi 2015)

Conclusions and low-hanging fruits

Water pollution

A hybrid policy of information provision and effluent charges may achieve pollution reduction goals

- Effluent charges: incentive to innovate and cost effective
- Information provision: eliminate information asymmetries

Creating and defining property rights is necessary for successful implementation of MBIs for water pollution

- Simply and clearly defined
- Align with existing institutional and legal frameworks
- Depend on market structure
- Account for the variable nature of water availability

Conclusions and low-hanging fruits

Ecosystem values

Expanding PES schemes shows promise, under the right conditions

- Political support
- Sustainable financing
- Lean institutional set-up (including cross-sectoral coordination across government agencies),
- Effective tools and systems,
- Clearly demonstrated impact, and
- Flexibility to adapt to different conditions across target ecosystems and communities