Resilient Asian Deltas

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Lead Water
WWF Greater Mekong
Irrawaddy 388 fish species (193 endemic)

Mekong 850 fish species 165 long distance migrants
The average abundance of 3,358 freshwater populations representing 880 species monitored across the globe declined by 83%. The white line shows the index values and the shaded areas represent the statistical certainty surrounding the trend (range -73% to -90%)1.

Key

- Freshwater Living Planet Index
- Confidence limits
Connectivity status of word rivers

River status
Free-flowing rivers (CSI > 95% from source to sink)
VL: Very long river (> 1000 km)
L: Long river (500 -1000 km)
M: Medium river (100 - 500 km)
S: Short river (10 - 100 km)

Good connectivity status (CSI > 95%)

Impacted (CSI < 95%)

No flow
The 3 zones of a fluvial system

(Schumm, modified)
The 3 zones of a fluvial system

(Schumm, modified)
IMPACTS OF SAND MINING ON WORLD’S RIVERS

- Impacts of aggregate mining on ecosystem structure, process, and biodiversity in rivers (Figure 3.7, Reference source not found).

- UNEP 2014

- Miatto, 2016

- Million tonnes

- Year

- Non-metallic minerals
- Metal ores
- Road fuels
- Biomas

- Railways
- Bricks
- Roads
- Buildings and infrastructure

- World
  - 1970
  - 1990
  - 2010

- Africa
  - 1970
  - 1990
  - 2010

- Asia+Pacific
  - 1970
  - 1990
  - 2010

- Eastern Europe, Caucasus, and Central Asia
  - 1970
  - 1990
  - 2010

- European Union
  - 1970
  - 1990
  - 2010

- Latin America and Caribbean
  - 1970
  - 1990
  - 2010

- North America
  - 1970
  - 1990
  - 2010

- West Asia
  - 1970
  - 1990
  - 2010
The 3 zones of a fluvial system

(Schumm, modified)
Worlds coastal Cities & Agglomerations
The 3 zones of a fluvial system

(Schumm, modified)

Bravard J.P, Goichot M. Gaillot S. 2013 Geography of Sand and Gravel Mining in the Lower Mekong River EchoGéo 26
Edward J. Anthony, Guillaume Brunier, Manon Besset, Marc Goichot, Philippe Dussouillez & Van Lap Nguyen (2015): Linking rapid erosion of the Mekong River delta to human activities, Scientific Reports, 5:14745 | DOI: 10.1038/srep14745
https://www.nature.com/srep/
Specificities of Ayeyarwady

- Land use activities altering flow and sediment input:
  - Changing the balance between sediment input and flow will change the river channel shape

- Reduction in peak flows a big risk:
  - Low slope of river makes water height main driver of river energy

- Large increases in sediment input in middle reaches will ‘choke’ channel increasing flood levels & negative impacts to navigation

- Local removal of sand & gravel downstream destabilise banks & ‘starve’ delta


World Large Deltas at Risk

Loss of sediment load
- [75 % ; 100 %][
- [50 % ; 75 %][
- [20 % ; 50 %][
- [0 % ; 20 %][

Manon Besset, 2017
Asian Deltas at Risk

- Home to 400 million people & > 10 mega cities in Asia
- Most bio-diverse areas for freshwater & marine species on the globe: Mekong >450 & Yangtze host >300 fish species
- World’s most productive ecosystems: fish & rice
- Asia’s economic engine: e.g. 25% of Vietnam GDP & 30% of China GDP
- Most vulnerable to climate change (top 10 countries)
Asian Deltas are sinking faster than Sea Level Rise

>500M of the Most Marginalized are exposed to water stress, natural disasters & food insecurity

Restoring delta resilience is the single most effective climate adaptation strategy

Infrastructure, agriculture, fisheries and supply chains are exposed to increased water risks

Reducing water risk exposure in deltas is best return on investment opportunity

Delta Degradation = Loss of Species & Ecological Functions

Largest opportunity to bend the global biodiversity curve in terms of number of species at risk
Restore the natural resilience of the largest Asian deltas, as well as de-risking investments & social capital

**Increased Political Action for Delta Resilience**
- Joint resolution by heads of states
- Vision developed for each delta

**Nature Based Solutions & Scale**
- Sediment budgets - alternative sourcing
- Power sector vision
- Guidelines/safe guards

**Redirect Financial Flows to Sustainable Practices at Scale**
- USD 10 M seed fund & USD 5 bn portfolio of projects developed & financed
Stop the Asian Deltas from sinking!

For more information, please contact