

The Rivers' Role in Mitigation of and Adaptation to Climate Change, by Bernd Gundermann

The role of the river in mankind's efforts to both mitigating the impacts of climate change as well as adapting our societies to it cannot be underestimated: it is the role of a mentor. For hundreds of millions of years rivers were nature's fluid connector, collecting, carrying, and mingling sediments and organics and eventually breeding new life within their waters. The river's ever-changing permanence that patiently endured both the evolution of life and the emergence and failure of civilisations currently witnesses humanity's struggle to sustain its existence in the face of the swiftly changing climate. The river's patience will outlast our prevailing short-term, quick-gain culture. Its fluidity will teach us to leave our rivers space to breathe and to fluidify our civilisation. The river waters' capacity to create and nurture life demands us to finally give up assuming a commanding position superior to nature but to blend in and adapt to its delicate transient equilibriums.

Discussing the role of rivers with regards to Climate Change means already to transcend the limitations of pure hydrology. Thus we ought to look at the rivers' entire watersheds and encompass the entirety of effects triggered by the changing climate instead of just focussing on the small surface area of the water itself. Acknowledging the intricate nature of rivers as communicators within their basins will be the only way to come to meaningful conclusions about mitigation of and adaptation to the impacts of climate change.

1. Navigation

The waterways' traditional role as main distribution networks has been diminished in favour of trucking. The replacement of industrial storage with just-in-time production made the highways become moving storage facilities. The economical benefits of this trend are, however, outweighed when considering the environmental impact. Inland barges are by far the least polluting mode of cargo transportation. Therefore, another contribution of rivers to climate change mitigation would be to strengthen freight transport on barges between integrated cargo-hubs, providing a seamless transshipping between various modes of transport at strategic locations in proximity to industrial parks and cities. Evaluations of economic efficiency for cargo transport need to complement costs for environmental harm.

- Why isn't there more barges carrying containers integrating ocean and inland shipping as well as transport by trains and trucks?
- When will the currently abandoned canals of the 19th century be recommissioned serving urban industries with cargo?

2. Hydropower

Hydropower offers GHG emission-free energy generation. However, the increasing criticism of both the cultural and ecological impacts of imposing dams and reservoirs goes deeper. It calls for a paradigm-shift. When in 1935 Hoover Dam was dedicated, the U.S. Interior Secretary Harold Ickes announced: "Pridefully, man acclaims his conquest of nature."¹ Today, the revision of this claim asks the industry to supersede dams with newer modes of generation offering reduced footprints such as clusters of in-stream turbines directly linked to communities with self-governed micro-grids.

The decline of power companies offering centralised supply and distribution gives way for decentralised, minimal, and smartly implemented systems that are attuned to both varying