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Human-River Relationship in the 21st Century

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River use

- Water source: drinking water, household water, irrigation, industrial use, cooling water
- Food source
- Recreation
- Sewage recipient
- Physical barrier
- Navigation route
- Flood protection
- River engineering
- Energy source
- Legal and political structure: state or private property, political border, objects of human conflicts and cooperation, recently rivers may have legal status as persons
- Source of national proudness, subject of transboundary conflicts
- Cultural object: myths, legends, arts, religions (river Gods, sacred rivers)
- Subject of sciences: history, philosophy, sociology, natural sciences, river science

River transformation

- River regulation (straightening/shortening/narrowing/widening/stabilizing the riverbeds, groynes, embankment by riprap and concrete, dredging, sand and gravel mining, narrowing floodplains with dikes, create uniform channels by eliminating sidearms and islands)
- Water use (drinking water, irrigation, cooling, industrial processes)
- Water allocation between watersheds
- Pollution (chemical, thermal, biological, solids – like plastic objects and microbeads)
- Deforestation of watersheds and floodplains, cultivation forest monocultures
- Construction of buildings and roads on floodplains
- Replace whole river-sections by artificial side channels
- **Construction of dams, create reservoirs; stream power abstraction and transformation to electric power**

The 20th Century has been the Dams Age

“Simply put, the Twentieth Century has been the Hydraulic Century, the Age of Dams. At least ninety-five percent of the world's significant dams (usually defined as those more than fifteen meters high) were built in my father's lifetime.”

(Reisner, M., 2000)

Celebration the humans' victory over nature



Dnieper Hydroelectric Station, USSR



Franklin D. Roosevelt at the Hoover Dam, 1935

Herman Göring at the construction site of Tauern power station, Kaprun, 1938



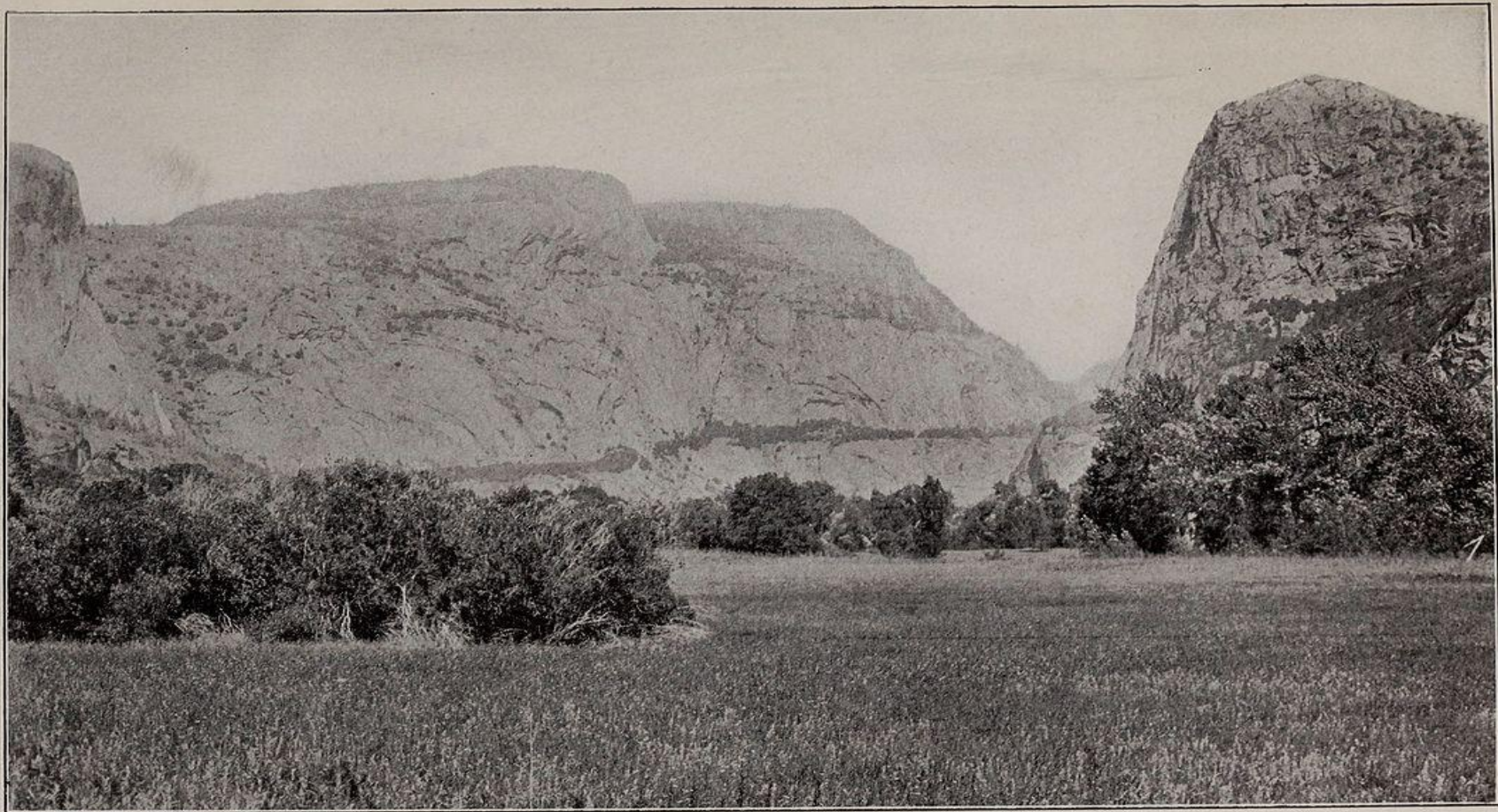


Jawaharlal Nehru at the inauguration of Bhakra Dam, 1963

Beginnings of the disillusion



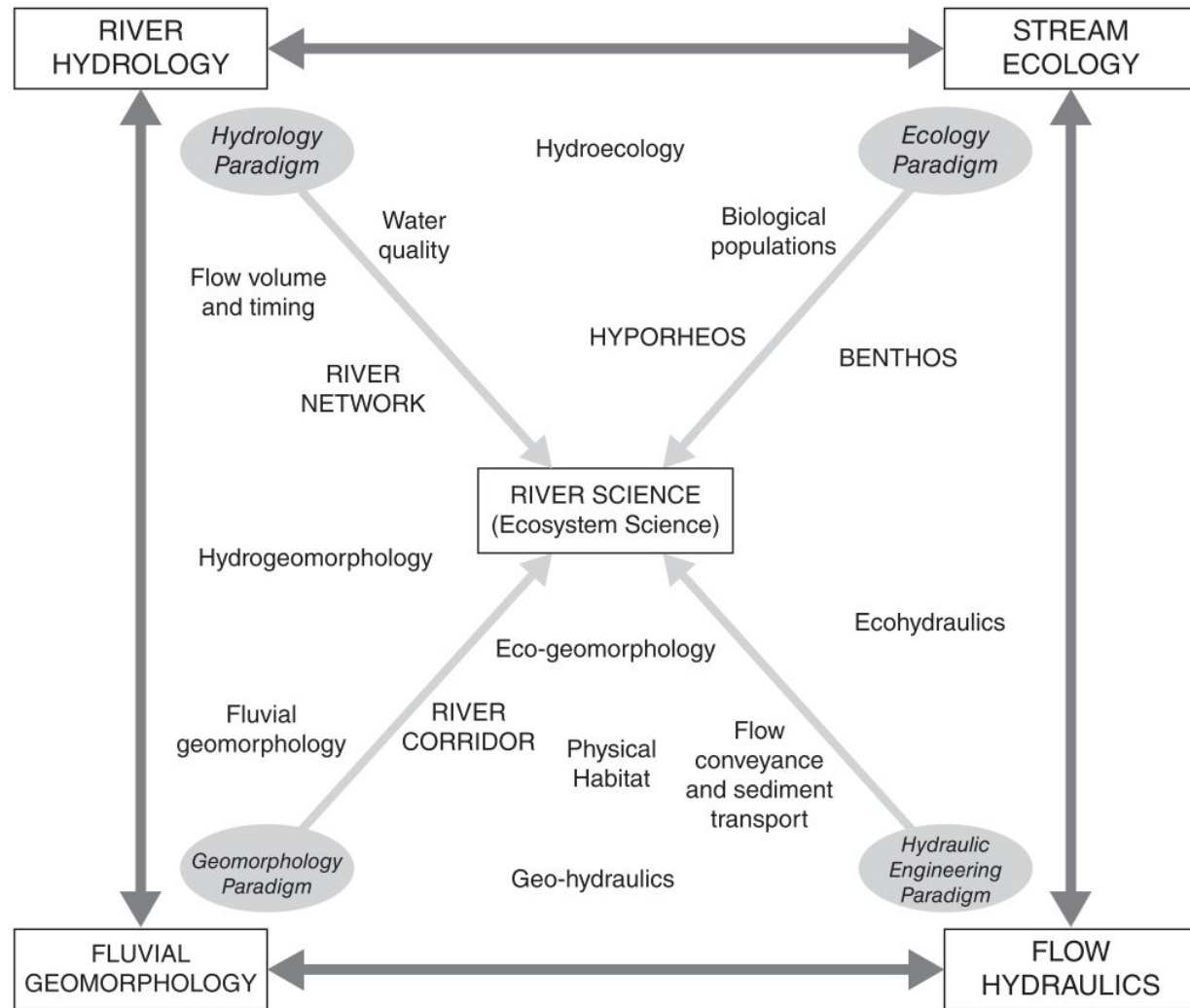
John Muir with Theodore Roosevelt on Glacier Point in Yosemite in 1903 / Wikimedia Commons



HETCH-HETCHY VALLEY, YOSEMITE NATIONAL PARK, CALIFORNIA.
View from Surprise Point, looking toward lower end of valley. See page 113.
Photograph by H. W. Gleason, Boston, Mass.



Evolution of river science







Lower Sycan River. Photo: Jim O'Connor, USGS



Photo: Hillebrand Steve, US Fish and Wildlife service - www.public-domain-image.com



Impacts of river use and transformation

population growth, economic growth, technology development, electric power, extension of agriculture, irrigation, inland navigation, flood protection

at a price of negative impacts on humans, like

poisoned water, water shortage, less food, diseases, unaesthetic landscapes, impoverishment, forced displacement for ten millions, and even forced labor for ten thousands, increased flood risk

and at a price of negative impacts on rivers and riverine ecosystems, like

degradation of river channels and floodplains, fragmentation of rivers, replacement of nature by artefacts, replacement of rivers by reservoirs, shrinking and disappearing freshwater and wetland ecosystems, biodiversity loss

Anti-dam movements and reactions

| | |
|----------------------|---|
| 1980s - 1990s | Governments' and international institutions' failure to cope with aggravating environmental problems |
| 1990s | Increasing recognition of civil organizations by public opinion and UN conferences. International cooperation and network of NGOs |
| 1993-1995 | World Bank withdraws support for some large dam projects (Sardar Sarovar, India; Three Gorges, China; Arun 3, Nepal) |
| 1995-1996 | World Bank's internal report by the bank's dam funder lobby |
| 1997 | Multi-stakeholder workshop held by the World Bank and IUCN, participants agreed to launch an initiative to assess the situation of large dams and provide recommendations for the improvement the decision-making |
| 1998-2000 | The World Commission on Dams mandate, released its final report in 2000 |

World Commission on Dams

- Dams have made an **important and significant contribution to human development**, and the benefits derived from them have been considerable.
- In too many cases an **unacceptable and often unnecessary price has been paid** to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment.
- **Lack of equity in the distribution of benefits** has called into question the value of many dams in meeting water and energy development needs when compared with the alternatives.
- By **bringing to the table all those whose rights are involved** and who bear the risks associated with different options for water and energy resources development, the conditions for a positive resolution of competing interests and conflicts are created.
- Negotiating outcomes will greatly improve the development effectiveness of water and energy projects by **eliminating unfavourable projects at an early stage**, and by offering as a choice **only those options that key stakeholders agree** represent the best ones to meet the needs in question.

The millennium

“The rescue can be accomplished if natural habitats are not only preserved but enlarged, sliding the numbers of survivable species back up the logarithmic curve that connects quantity of biodiversity to amount of area. Here is the means to end the great extinction spasm. **The next century will, I believe, be the era of restoration in ecology.**”

(Wilson, Edward Osborne., 1992)

“The wealth of **scientific knowledge gained over the last decade is creating the conditions for a very different relationship between people and rivers** - a relationship of mutual health and coexistence that offers great benefits to this and future generations.”

(Postel, Sandra and Richter, Brian, 2003)

U-turn in the river transformation



U-turn in the river transformation



Photo: Frans Blok, 2016

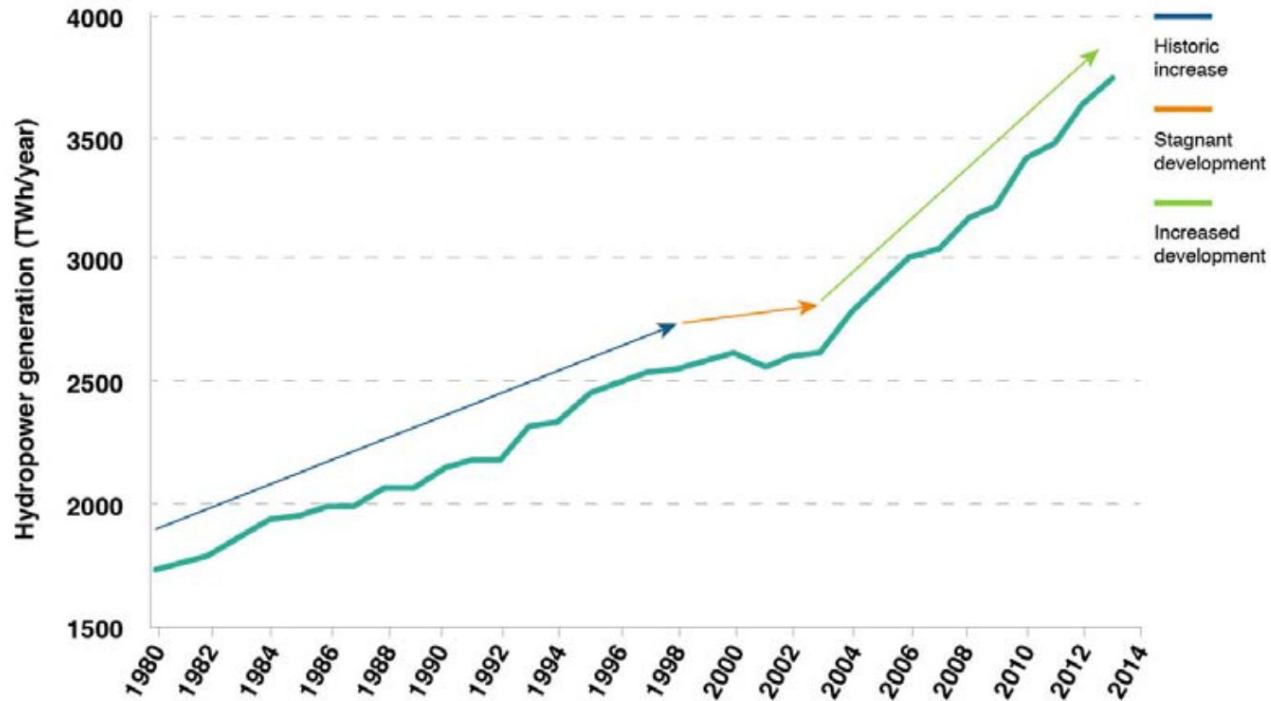
U-turn in the river transformation



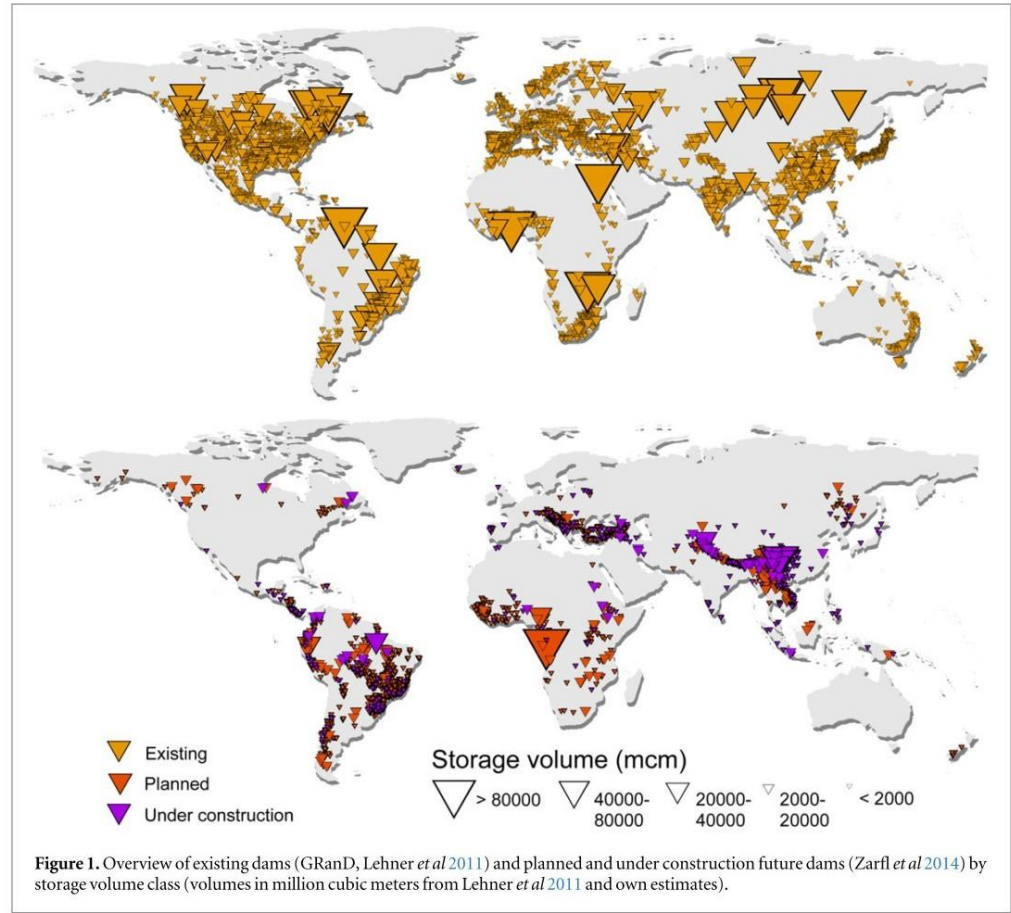
The reactions on the WCD's report

- Welcomed by international civil society, international organisations (such as UNEP and WHO), and financial institutions (such as the African and Asian Development Banks), and a few institutions and companies of the dam industry
- Never adopted formally by major international financial institutions and national governments involved in the dam building business
- Rejected by most institutions and companies of the dam industry, and in the following years formulated their own guidelines to replace the WCD's recommendations

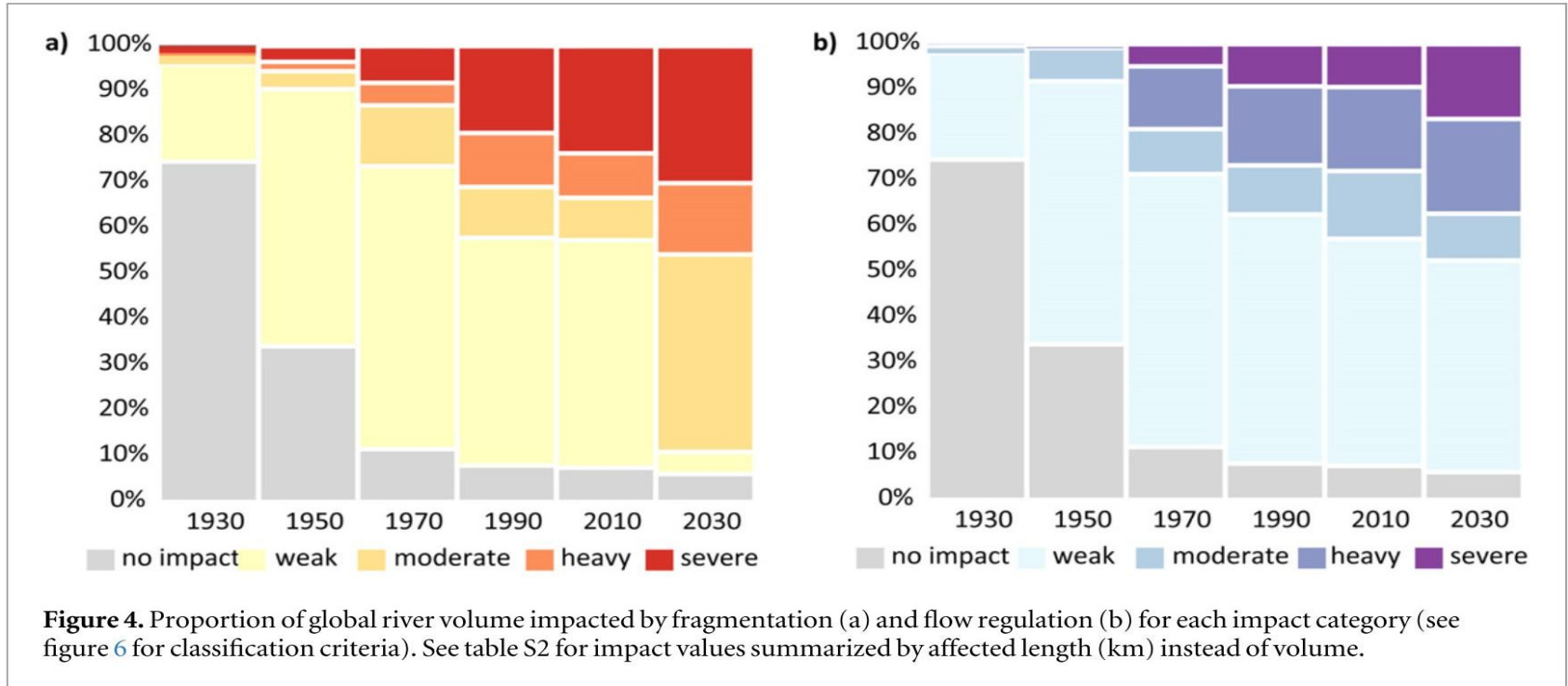
The hydropower boom of the 21st century



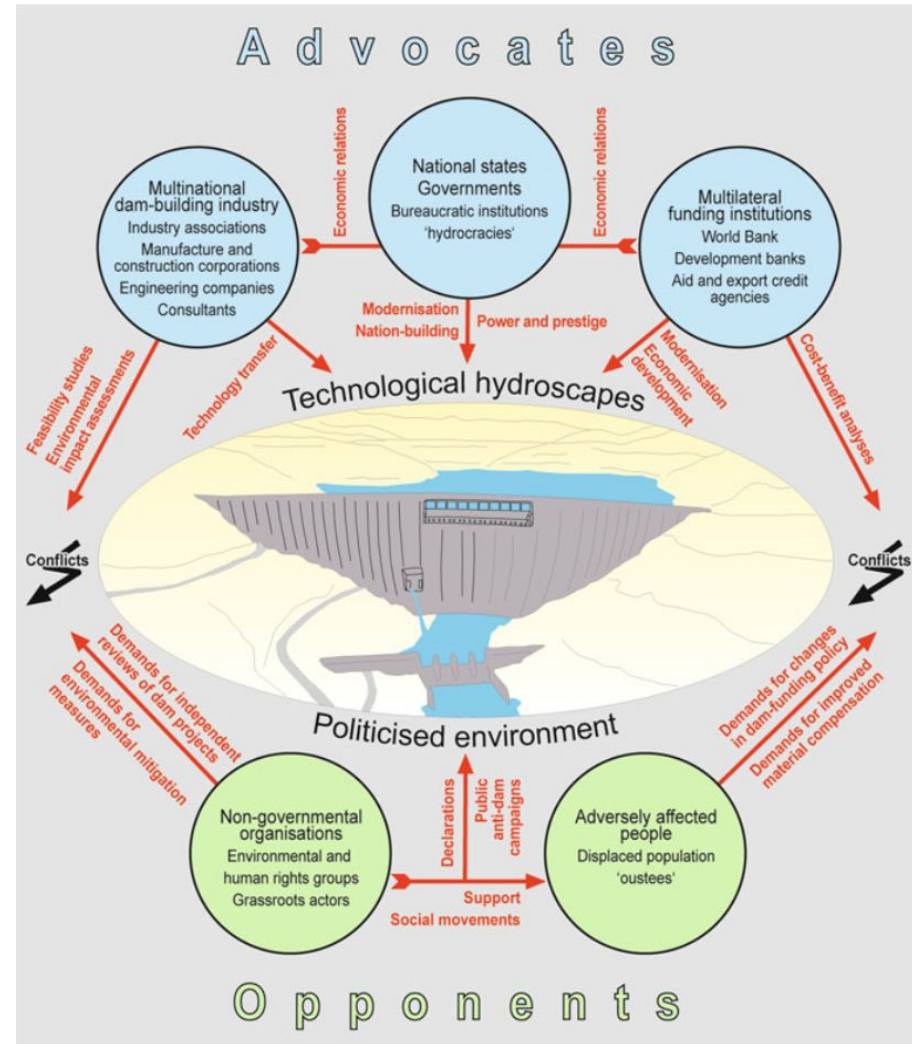
The hydropower boom of the 21st century



Expected impacts

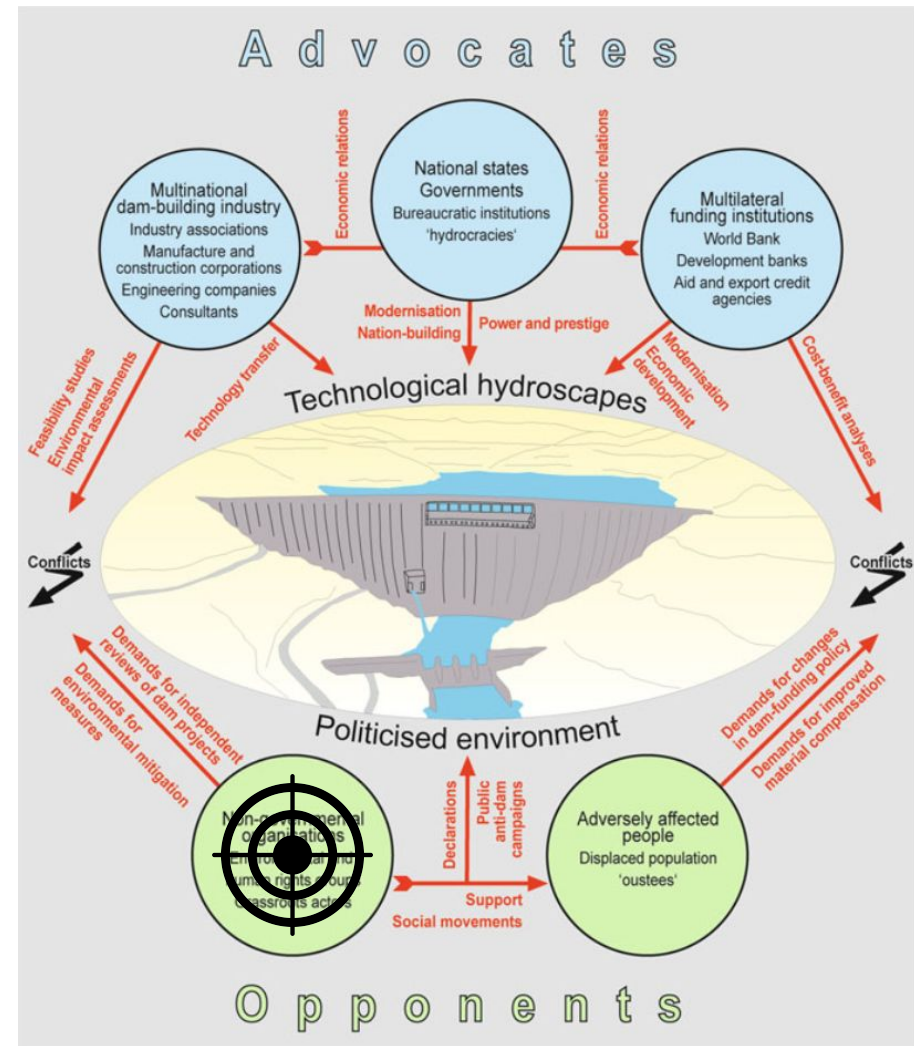


The Battlefield



The Battlefield

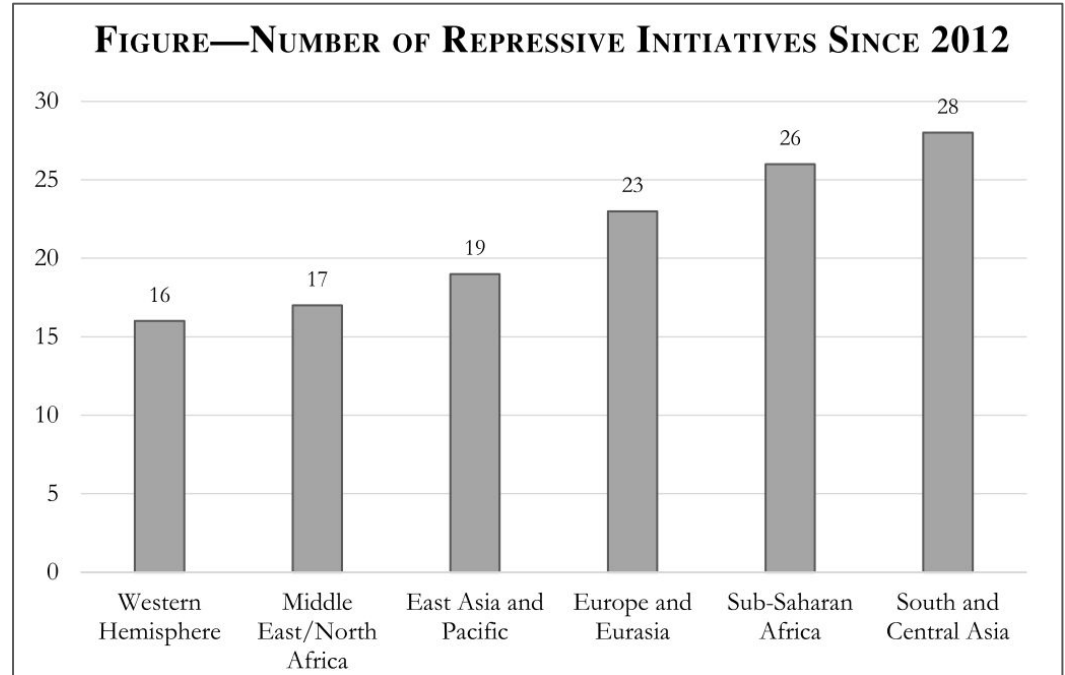
Assaults on civil society



Assaults on civil society

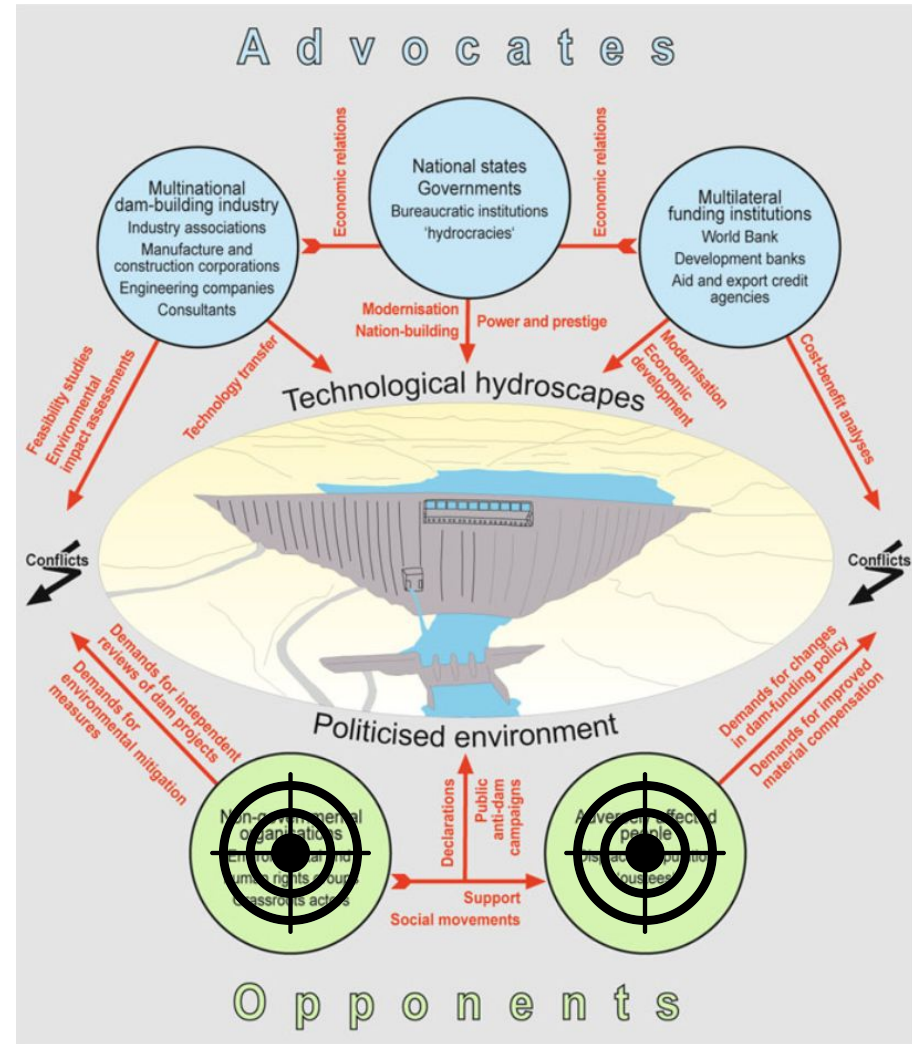
“If there was a global associational revolution in 1994, by 2004 the global associational counter-revolution had begun.”

Douglas Rutzen, President
International Center for Non-profit law (ICNL)



The Battlefield

Pressure on adversely affected people



All years

2017

2016

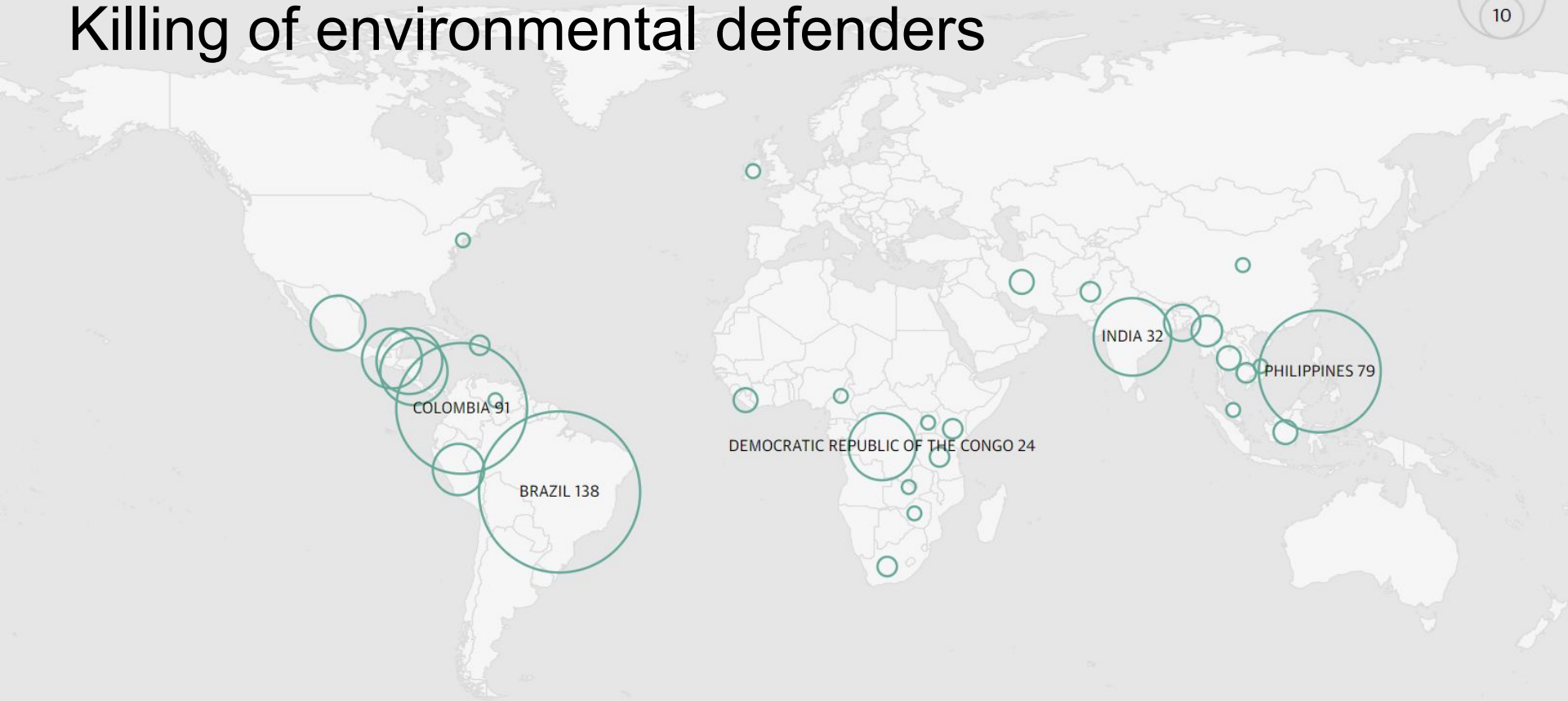
2015

Deaths

40

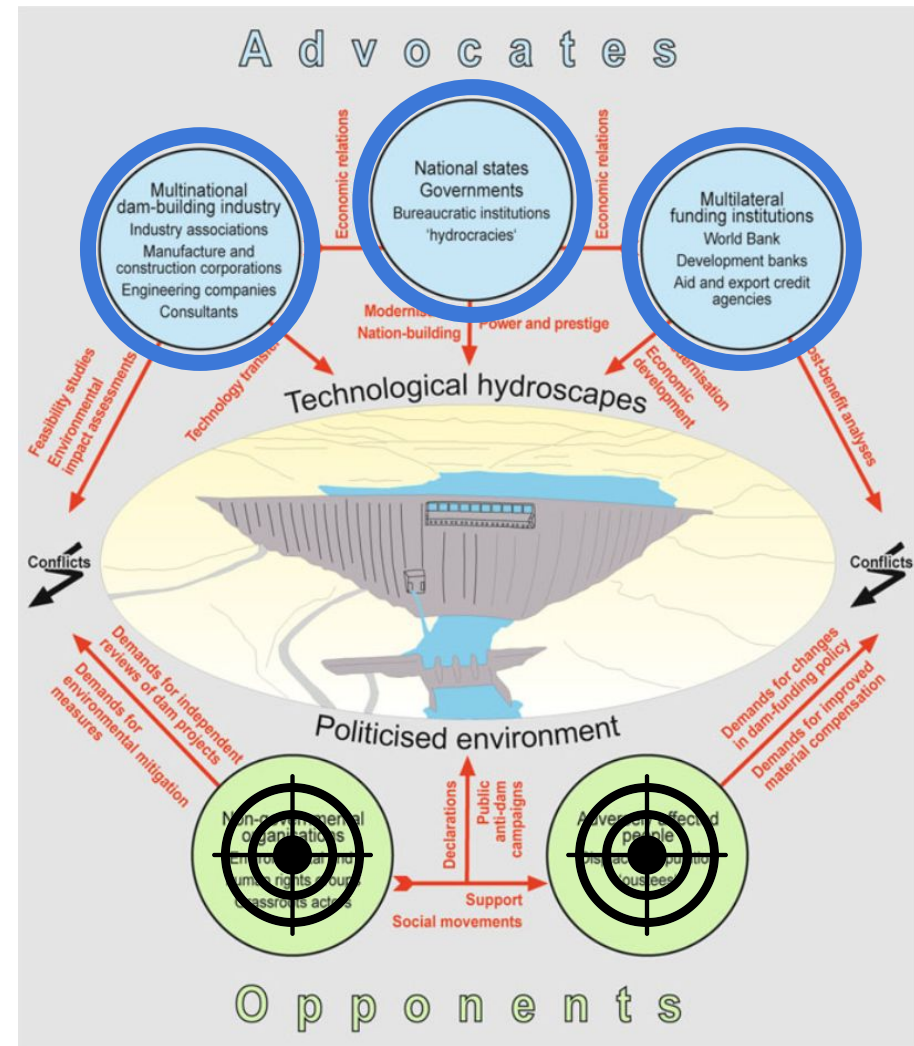
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Killing of environmental defenders



The Battlefield

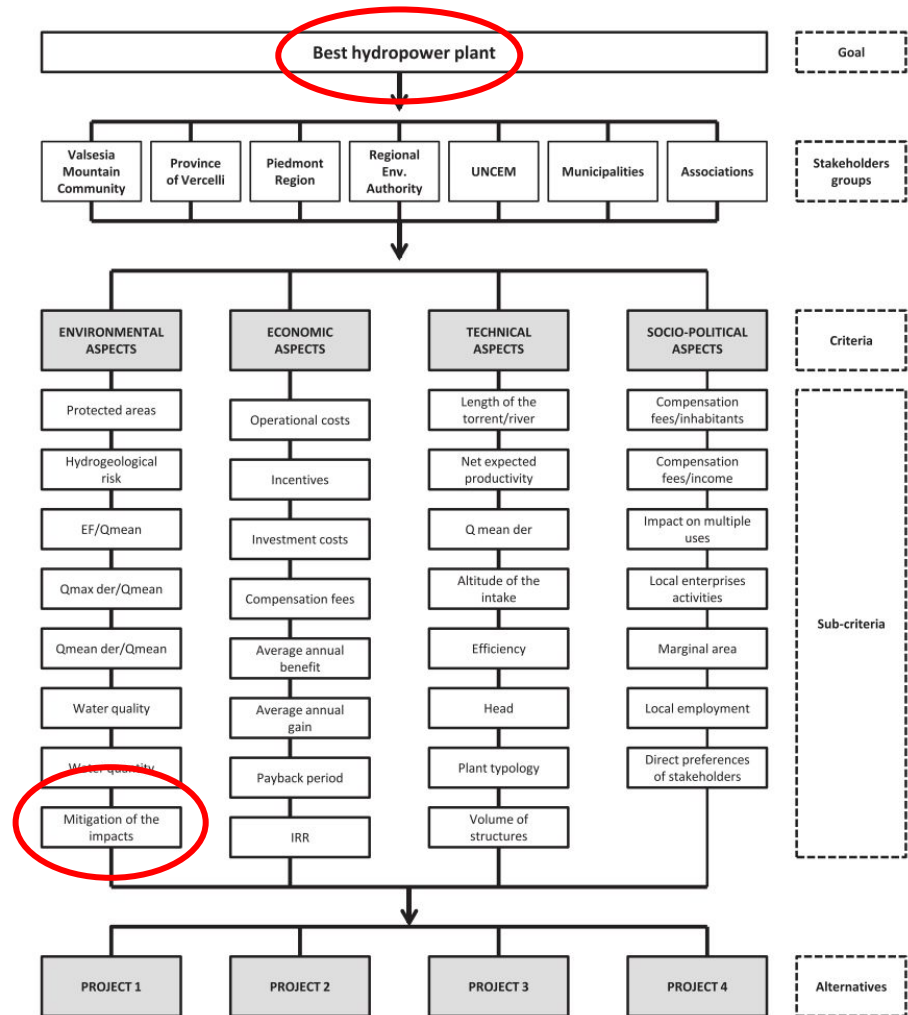
Strong alliance of dams' advocates

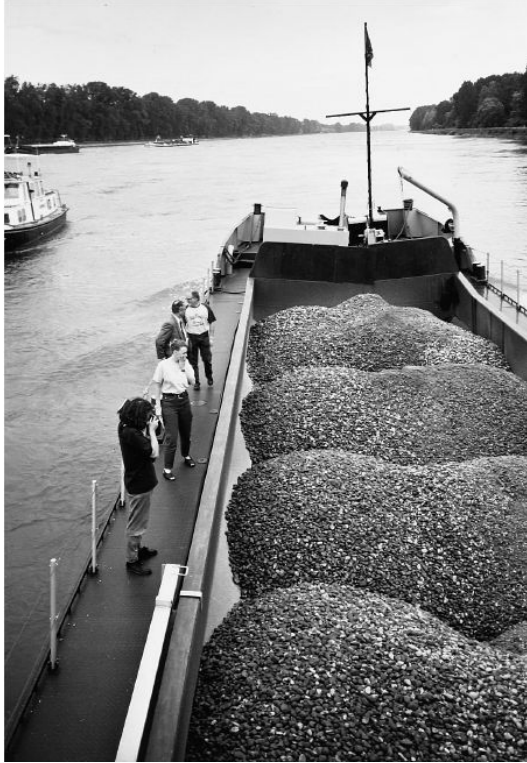


Limited options

Alternatives offered by the hydropower industry are restricted to choose the “best hydropower plant”.

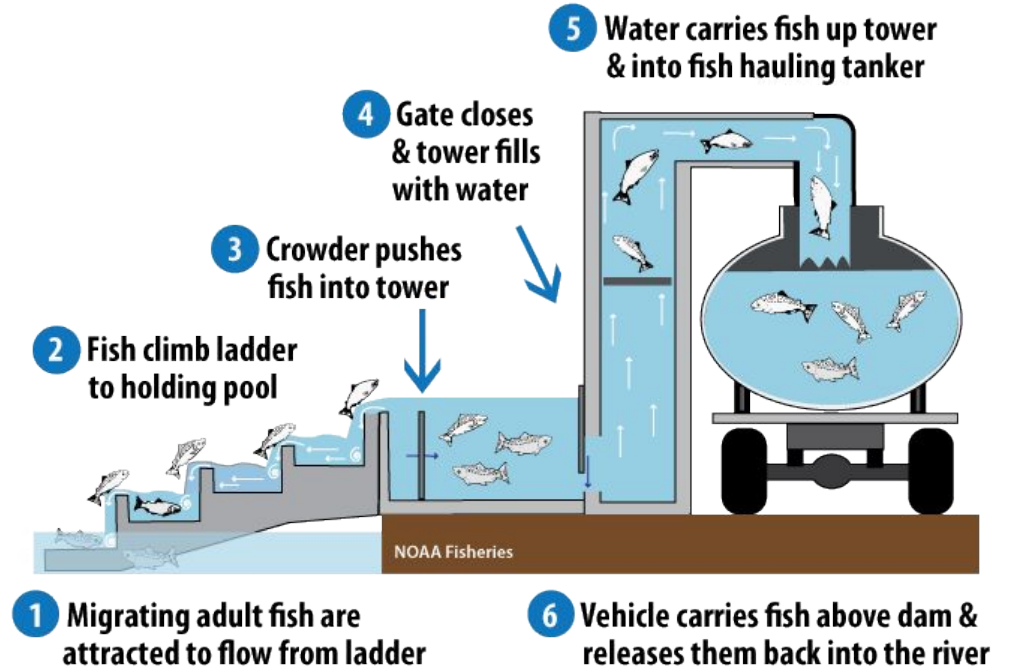
Engineers usually offer mitigation of the environmental impacts, as they can't be prevented.





Sediment replenishment on the River Rhine downstream of the Iffezheim dam
Kondolf, G. Mathias (1997)

Mitigation



Trap and Haul. NOAA Fisheries West Coast Region
www.westcoast.fisheries.noaa.gov/fish_passage/about_dams_and_fish/trap_and_haul.html

Reasons behind the new hydropower boom

- Reopen supports by international financial institutions
- Special financing constructions to attract private investors
- Subsidized by involved national governments
- Exploitation climate funds (Clean Development Mechanism, Green Climate Fund)
- Corruption
- Weak/formal impact assessments, in many cases by institutions linked to the hydropower industry
- Limited options for stakeholders
- Spare compensations promised to affected people
- Shrinking space for civil society

Conclusion

- The present and forecasted hydropower boom shows that the efforts to protect the rivers have failed to stop and even to slow down this process.
- There is an urgent **need of a new global initiative** to prevent further damming of rivers and increase the support of all activities aiming to reborn and healing the rivers with dam removals and with other ecological restoration methods.
- Such an initiative should **learn from experiences with the World Commission on Dams**
- It is necessary to address all negative local and global tendencies, like the assaults on civil societies, attacks on environmental sciences, dismantling environmental authorities, repeal of environmental laws and regulations, waste of public money by subsidies for the hydropower technology.
- The hydropower technology should be declassified: it is not clean, not renewable, not sustainable

Conclusion

A new global initiative might be organized in cooperation with individuals, local and international organizations

- focused on defending rivers
- working for the **protection of all related ecosystems**, like forests, soils, lakes and oceans
- river scientists, economists, sociologists, lawyers, artists, politicians committed to find and implement ecologically sound alternatives
- inventors, entrepreneurs and investors **offering viable alternatives**, as the exponentially developing solar and wind power solutions and storage technologies

Conclusion

It is essential to be aware that the competition with dam construction is **seriously distorted by corruption and state capture**.

At the same time, **defending the rivers is hindered** by the shrinking space for civil society, increasing anti-democratic tendencies, populism, nationalism and weakening of multilateral cooperations.

Despite all difficulties, some signs indicate that **positive changes** of human-nature relationship in general – and human-river relationship in particular – is **not completely hopeless**.



Dam buildings *and* dam removals: The scandal of the human-river relationship in the 21st century.

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