

Titicaca Desaguadero Poopó System Bolivia–Peru

- 143,900 km²
- Transboundary system with cooperation in development since the early 90s
- Pastureland (40%) and irrigated cropland (10%); main water use: irrigation
- Arid region, sensitive ecosystems to climate change (Poopó Lake in Bolivia)
- Competition between upstream (agriculture) and downstream (irrigation, livestock)
- Inequity (permit holders in Peru vs unregulated irrigation system)
- Operational protocols for Lake Titicaca gages in development



BARRIERS TO THE ADOPTION OF INNOVATIVE ADAPTATION POLICIES

Barriers

Example

Rigid regulations	➤	Lack of water allocation rules in Bolivia and temporary water rights in Peru without update protocols; lack of transboundary regulations and joint management
Limited institutional know-how on novel technologies and governance mechanisms precludes transformation	➤	NBS are almost entirely NGOs projects. Bolivia and Peru only follow supply-side solution. Novel technologies such as artificial glaciers are options known by stakeholders by requires support for the implementation
Costs of transforming institutions to adopt novel policies and governance mechanism	➤	Lack of: 1. legal framework for water allocation between riparian nations; 2. local water authority generating transaction costs due to one-size-fits-all policies inefficient in specific regions of the river systems; 3. common inter-state body for ecological monitoring or infrastructural action
High information, bargaining and enforcement costs can limit the diffusion of new (re)allocation instruments	➤	Uncertainty in water rights in case of drought years. Lack of efficient regulatory framework for insurance
Water (re)allocations can generate nontrivial and asymmetric impacts on other strategic sectors such as food industry, tourism, etc.	➤	Water rights in Peru can be negated in case of drought to preserve the ecological functioning of the river
Public political or regulatory entity is co-opted to serve the interests and needs of a minor group	➤	Privilege for some water users
Limited alternative mental models (e.g., awareness of feasibility of soft policies such as trading) leads to the persistence of conventional mental models and policies	➤	NGOs push NBS; lack of transnational cooperation, enforcement, etc.
Limited monitoring, as well as enforcement, and institutional capabilities	➤	Lack of binational regulation to penalize infringements, and of monitoring process to detect theft in Bolivia, groundwater formalized at 5% in Peru
Innovative solutions demand high return from investments hindering their implementation	➤	Extensive paybacks periods and uncertainty about effectiveness of innovative solutions, such as NBS or insurance systems, limit their implementation
Decision-making and people's awareness are strongly influenced by personal beliefs (based on experiences, memories, group dynamics etc.)	➤	River basin authorities are mostly made of hydrologists, who tend to support engineering approaches over soft/economic instruments

POTENTIAL INNOVATIVE ADAPTATION POLICIES

1. Nature Based Solutions: creation of artificial glaciers
2. Agriculture insurance mechanism
3. Definition of gages management rules in the Titicaca Lake by the Binational Climate Service, including hydrological, ecological, and economic criteria
4. Water banks for the environment: flexible water allocation, in case of drought, with compensation system