

Economic Aspects of Transboundary Water Allocation

Growing pressures are making existing inefficiencies in water allocation regimes increasingly costly: the 19th century allocation arrangements are poorly equipped to serve a 21st century society and economy.

Angel Gurría, OECD Secretary-General

While **transboundary (TB) water allocation** focuses on **quantity, quality and timing**, **domestic allocation regimes** go into a greater level of details: they determine **who** is entitled (has a legal or historic right) to use available water resources, **how much**, from which source and **of what quality, when, where and how** (for which purpose). Growing **pressures on water resources** increase the value of sound allocation regimes working well under various and changing conditions, **resilient** to various shocks and uncertainty.

Prior to reforming the existing, or introducing a new, allocation regime - domestic or in a transboundary basin - a careful **economic analysis** is required to identify and assess (in quantitative or at least qualitative terms): (i) national water use needs and priorities; and (ii) expected impacts, identify needs for proper incentives and compensations, and avoid eventual non-intendent negative consequences of respective allocation regime. Assessing economic aspects of TB water allocation **is not yet a common practice and there is no generally accepted methodology**. However, an economic assessment at national level strengthens the position of respective country in TB negotiations by supplying it with bold economic arguments and hard figures. Economic arguments (such as specific water consumption per ton of produce in irrigated agriculture) are more and more often used in negotiations on TB agreements.

Respective section in the future Handbook may contain definitions of relevant terms and concepts, to facilitate uniform interpretation thereof by riparian countries, and provide some guidance on the logic and available methods of economic analysis of national and transboundary allocation regimes and of individual decisions on water allocation or re-allocation.

From **(socio-)economic analysis** perspective, and related legal, institutional and regulatory frameworks, the following aspects and considerations are relevant:

Specific features of water as an essential economic good for which no perfect (or even good) substitution exists: **public and private good** dimensions, a combination of a Good (water as a chemical substance) and a Service (water delivered from the source to water user), etc. They determine an **hierarchy of demands (water hierarchy)**: from essential needs of population and environmental flow to less priority uses....

Demand for, and Supply of, Water for consumptive and non-consumptive uses in the basin in question, and a good understanding of their **key drivers**. On the **Supply** side, important factors are: the distribution (typically, uneven) of water resources across the territory, high variability of rivers run-off very much dependant on season and weather conditions. While **Demand** much depends on demography and migration, the size & structure of the economy and technologies in use, level of urbanisation etc.

Allocative efficiency and Cost-effective use of limited water resources for achieving overarching socio-economic & development objectives and targets, such as SDGs, transition to greener inclusive economy, maximising value added /social welfare, improving wellbeing of the population, etc. (Minding the hierarchy and prioritisation of policy objectives and targets and associated water hierarchy).

Respective analysis should be based on a **nexus**/the whole economy approach, and often requires hydro-economic modelling, e.g. see OECD (2016). However, economic optimisation possible at national level, typically is not possible in transboundary context; moreover, water uses and respective economic incentives optimal for one riparian country may not be consistent with solutions optimal for other riparian countries.

Competition for limited water resources between riparian states and competing policy objectives and water uses (sectors, individual users)

The competition for water resources is intensifying due to impact of climate variability and change on water resources, population growth or migration, urbanisation and structural changes in the economy, economic development, increasing anthropogenic impact on water quality...

Equity, reflecting as minimum the public good dimension of water and the human right to water.

Water use efficiency by respective uses and users, as an effective policy response to water scarcity. It goes after considering eventual structural changes, (e.g. change in the crop mix, or shift to less water intensive industries).

Water infrastructure systems, required to deliver water from water sources to water users, for water storage (reallocation of water upon time) or treatment, or transfer of water from one basin to another, and related **investment** in water infrastructure (costly & long live, hence path dependent) and O&M costs.

Environmental & resource costs – definitions could be found in the EU Water Framework Directive

Economic regulation, required along with other types of regulation (environmental, sanitary, technical) due to the public good dimension of water, and as water infrastructure systems often have natural monopoly features.

Path dependency - it concerns both past water allocation practices and past investments in water systems, and **Adaptivity**, required for making the water systems and allocation regimes **resilient**.

Economic incentives – e.g. those created by economic instruments or compensation mechanisms

Water pricing and other economic instruments – it concerns: water tax or water abstraction fees, reflecting relative water scarcity in each specific hydrographic basin, and fees for non-consumptive water uses (e.g. for navigation, or hydropower generation); fees/tax for return water and wastewater discharges (depending on the quality of discharged treated/untreated wastewater or return water, as well as on the overall pollution load in the recipient water bodies), fines for violation of water abstraction or wastewater discharge requirements/obligations; (typically regulated) tariffs for water services; special instruments to control diffuse water pollution (e.g. excise tax on toxic agri-chemicals and other polluting substances), special tax instruments to capture water rent; **insurance** against the risk of flood or drought, or lost harvest (or other produce) due to water scarcity etc. (examples see in (OECD, 2013))

Market for water use quotas or quotas for discharging polluting substances, as an effective mechanism to re-allocate water to high values uses, and for water quality control (protection of water bodies from excessive pollution).

Financial sources, instruments and mechanisms, domestic and international

Economic (incl. distributional), **fiscal & financial and social impact** (e.g. on equity or household income level and distribution) **of the allocation regime in question, and of each individual decision on water allocation**, or re-allocation.

Externalities, both negative and positive, often **transboundary**. This is very topical for instance for so-called multi-purpose water infrastructure (MPWI) – see (OECD, 2016).

Compensation mechanisms, to achieve a *win-win-no lose* situation in cases where application of water allocation rules result in winners and losers – directly or through associated externalities.

In the situation of water scarcity (e.g. in super dry years), or unexpected decline in water quality, the allocation regime often requires disconnecting of some low priority water uses and users from water supply (or drastically reducing supply) thus generating economic & financial losses for respective economic agents.

Chocks, Risks and Uncertainty – note that **Resilience** to Chocks, Risks and Uncertainty comes **at cost**

Cost of inaction - see above the quote from OECD SG.

References:

OECD Council (2016), *Recommendation on Water*, <http://www.oecd.org/water/recommendation/>

OECD Water Resources Allocation – Policy Highlights,

<https://www.oecd.org/environment/resources/Water-Resources-Allocation-Policy-Highlights-web.pdf>

OECD (2018), *Strengthening Sharda Multi-Purpose Water Infrastructure in Kazakhstan*, OECD Studies on Water, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264289628-en>

OECD (2016), *Reforming economic instruments for water management in EECCA countries – Policy Perspectives*, https://issuu.com/oecd.publishing/docs/policy_perspective_economic_instrum

OECD (2015), *Water Resources Allocation: Sharing Risks and Opportunities*, OECD Studies on Water, OECD Publishing, Paris, DOI: <http://dx.doi.org/10.1787/9789264229631>