



THE STATE OF FOOD AND AGRICULTURE

Water accounting and auditing for better water governance

Growing competition for water calls for a new approach to water resource management

Water underpins many of the Sustainable Development Goals (SDGs), not least those relating to Zero Hunger and Clean Water and Sanitation. Unfortunately, achieving these objectives by 2030 will be a challenge. Population growth and socio-economic development are driving increased demand for water. In the last two decades, freshwater resources available per person have declined by more than 20 percent (see Figure 1). The challenge of meeting rising demand is a growing concern, along with threats from climate change. Globally, about a tenth of rainfed cropland and more than 60 percent of irrigated cropland is highly water constrained, with severe implications for food security and nutrition. Growing demand for water is also creating fierce competition between sectors and individual users, exacerbating inequalities in access to water – especially for the most vulnerable – and threatening water-related ecosystems and the services they provide.

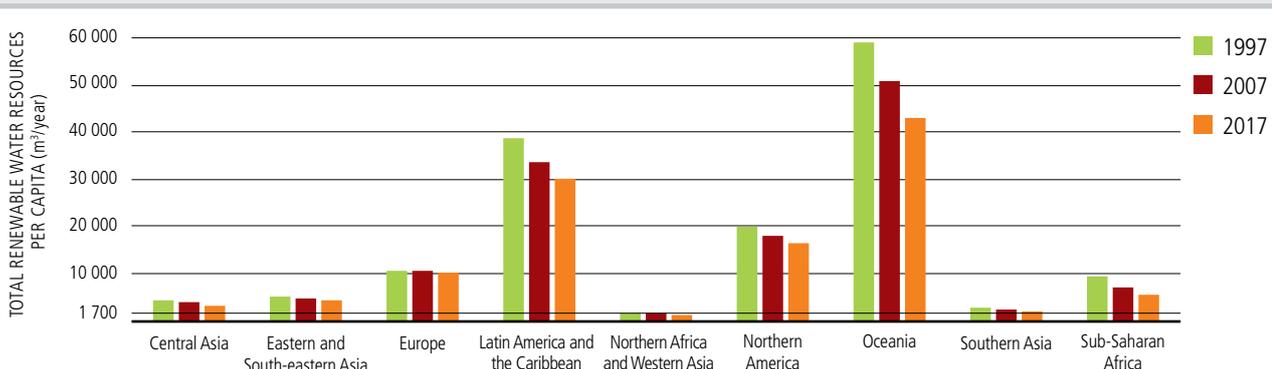
Agriculture is at the centre of these challenges since almost three-quarters of all water withdrawals are allocated to irrigation, livestock production and aquaculture. Yet, 41 percent of these withdrawals are not compatible with sustaining

KEY MESSAGES

- ▶ Growing competition for water calls for improved governance to ensure sustainable, efficient and equitable water use.
- ▶ However, any governance strategy will only be effective if preceded by water accounting and auditing.
- ▶ These can provide the foundation for sustainable and equitable water management.
- ▶ Effective accounting and auditing can be carried out with active stakeholder engagement at a reasonable cost.
- ▶ The right approach will depend on context, considering users' capacity and needs.

ecosystem services, challenging the achievement of the SDG agenda, which requires reconciling food production with environmental flows. Rainfed agriculture relies on water from precipitation but can still affect water-related ecosystems. The interaction between humans and the hydrological system is indeed complex and calls for a systematic and integrated approach to water management. There is essentially only one water resource, with surface water, groundwater and soil

FIGURE 1. Per capita renewable freshwater resources by region, 1997–2017



Source: FAO. 2020. *The State of Food and Agriculture 2020. Overcoming water challenges in agriculture*. Rome.

moisture content being critically linked. For example, intensifying agricultural water use upstream can affect availability downstream. Moreover, water-related ecosystems depend on the maintenance of groundwater and river flows.

Improved water governance is key to meeting human and environmental demands in an equitable, sustainable and efficient way, especially in water-constrained areas. However, improved water governance must be supported by a solid evidence base. Indeed, effective planning is impossible if stakeholders work with their own, differing and incomplete information. A cornerstone of achieving actors' consensus on information is **water accounting** – the systematic study of the hydrological cycle and the status and trends in water supply, demand, accessibility and use. **Water auditing** places these data in the broader context of governance, institutions, public and private expenditure, legislation and the wider political economy. Together, they support better governance.

How can water accounting and auditing support improved water management?

Water accounting and auditing can be used for a number of purposes strongly related to water governance and management issues, including:

- ▲ **Developing a common information base, promoting dialogue and resolving conflicts.** Stakeholder dialogue is key to effective planning. A key output of water accounting and auditing is the providing of a common information base that is available in a timely way and acceptable to all key stakeholders. This is also fundamental to resolving conflicts and establishing long-term water regulatory agreements or frameworks.
- ▲ **Identifying, adapting or developing solutions to water-related problems.** Water accounting can identify the underlying biophysical causes of imbalances between water supply and demand, while auditing helps ensure that solutions are politically, socially and culturally acceptable. In Iran (Islamic Republic of), accounting and auditing highlighted issues of agricultural water-use efficiency, groundwater depletion, and discrepancies between government recommendations on water use and actual availability. Similarly, in Jordan, water accounting highlighted water quality issues and pointed to the benefits of water harvesting for agriculture use.
- ▲ **Prioritizing investments to improve productivity sustainably and equitably.** Irrigated agriculture, while necessary for enhanced food production, is the main responsible for increased water consumption, reducing flows to other uses. Similarly, water harvesting and supplemental irrigation are important for increasing rainfed yields, but can affect water-related ecosystems and people who depend on them. While investments

in modern agricultural and irrigation technologies can help produce more output with less water, robust water accounting and auditing are key to prioritizing investments, and making them equitable and sustainable.

- ▲ **Managing the water–energy–food nexus.** A particular dimension of water competition is the water–energy–food nexus. The link between irrigation and biofuel demand or hydropower functions is an example of this nexus, in which water use by one sector can have unintended consequences for another. Water accounting and auditing can inform on these connections and trade-offs. In Morocco, water accounting and auditing revealed the growing imbalance between water supply and demand resulting from the fast growth of irrigated production, and identified the need for participatory aquifer management.

Making water accounting and auditing happen

Water accounting and auditing depend on context. There is no standard methodology, and the cost varies enormously with the scale and ambition of the programme and the type of information needed. To facilitate implementation of water accounting and auditing, policy makers are encouraged to consider:

- ▲ **Managing targeted data collection and analysis.** Advances in remote sensing and metering technologies, as well as open-access global and regional databases, reduce costs and make it easier to share information. Approaches that target the needed data and build on existing capacities can further reduce the costs.
- ▲ **Actively engage stakeholders in accounting and auditing processes.** Active participation of stakeholders contributes significantly to the accuracy, relevance and adoption of water accounting and auditing findings, outputs and recommendations. Stakeholders' empowerment is key to guaranteeing active participation and sharing responsibilities for the process.
- ▲ **Treat water accounting and auditing as a cyclical learning and information sharing process** whereby knowledge and understanding are improved incrementally with each cycle. This requires careful planning, appropriate sequencing of activities and a willingness of all involved to share findings and participate in multi-disciplinary dialogue. Information sharing allows stakeholders to have better overview of water issues.
- ▲ **Consult appropriate guidelines and standards for effective planning.** A sourcebook published by FAO¹ is available to help organizations use accounting and auditing for the first time, complement water accounting with auditing, or improve the processes already in place.

¹ FAO. 2017. *Water accounting and auditing: A sourcebook. Revised edition - November 2017.* FAO Water Reports No 43. Rome.

