With water resources in India facing severe stress, given numerous natural and man-made causes, it has become imperative to shift the focus to demand-side management of water resources, from the traditional supply-side engineering approach. This is where the State Specific Action Plans come to the rescue. Using the basic tool of data monitoring, these plans can help states in deciding how much water they can spend to ensure a sustainable flow of resources.

REFLECTIONS ON NATIONAL WATER MISSION'S EXPERIENCE WITH CREATING WATER BALANCE SHEETS FOR STATE SPECIFIC ACTION PLANS

➢➢➢ BY DR. VEENA SRINIVASAN AND DR. C.V. DHARMA RAO

WATER@GOVT.

REFLECTIONS ON NATIONAL WATER MISSION'S EXPERIENCE WITH CREATING WATER BALANCE SHEETS FOR STATE SPECIFIC ACTION PLANS

Continuously declining per capita water availability in stark contrast to the rising demands of urbanisation, food, power, and the environment has stressed the water resources in India to a drastic extent. The traditional engineering approach alone is not able to deal with the problem of looming water scarcity because once water resources in a river basin are fully allocated, these so-called 'closed' river basins can't be managed through the supply side. That is why the focus must shift to the demand side management of water resources.

Another problem that persists is that there are no institutional mechanisms to ensure that various sectors are consuming water within the limits of the annual water availability of the concerned river basin, after making allowances for environmental flows.

A major barrier to this regulation is data; we do not have a comprehensive account of water requirements and consumption of the varied sectors in the system. While we have focused on improving India's monitoring capabilities to quantify water availability through several successive National Hydrology Projects, there is a complete absence of comprehensive data on water use.

The plan to create state-level budgets under the National Water Mission as part of State Specific Action Plans (SSAP) is a promising step in this direction.

DATA COLLECTION AS THE PRIMARY SOURCE OF COMPREHENSIVE WATER RESOURCE MANAGEMENT

The National Water Mission (NWM) came up with the idea of using water balance sheets, based on the physical principle of the law of conservation of mass and its estimated inflows and outflows into each river basin, to create state-level budgets after a national workshop in June, 2017, at which funds were being provided for the SSAP in water.

At a concurrent workshop, states were invited to share their plans on water management. It was noted that most states presented only irrigation plans and not comprehensive water plans, thus illustrating a general lack of understanding among states about multiple dimensions and competing demands for water.

To deal with this, several rounds of consultations were held to finalise an approach and template for states, which can assure that water is being managed and distributed to various sectors, including irrigation, on a sustainable basis. The outcome of these consultations was a comprehensive 565 page document of a model template. The paradigm shift in the approach towards water management came through the introduction of water balance sheets.

This template works on a multi-pronged approach. First, it forces governments and non-government stakeholders to look at water holistically as a multi-disciplinary activity. In many states, there are over 30 departments that regulate water use, ranging from agriculture, forestry, municipal administration, power, to tourism. The SSAPs offer a tool to bring data from diverse ministries together.

Second, the template accounts for water flow starting from rainfall to the point when water leaves the basin, keeping in check all the flow pathways. It also accounts for soil moisture, surface, and groundwater linkages as well as wastewater return flows. No other existing methodology in the water sector in India achieves this sort of monitoring.

Third, the template provides tools to reveal the data gaps in supply and demand side, as well as water quality. The data when collected makes it possible to benchmark exercises to compare water use across sectors like thermal power plants, paddy irrigation efficiency, etc., across the country.

Last but not least, the exercise promotes harmonisation of political and hydrologic boundaries. Water availability is generally available at the basin scale, whereas demand data are usually collated by political units (wards, villages, blocks etc.).

OBSERVATIONS MADE BY THE STATES

Post its creation, the template has been taken to various states via state-level capacity building workshops. So far, about 10 states have reported back with their experiences. It has been noted that there have been certain commonalities in the lessons learnt, related to the early challenges in implementing water balance sheets through these workshops.

First, the template is unwieldy and intimidating. Not all the tables are actually necessary to get to the state water budget. Second, many state governments have complained that the data simply does not exist and the budgets created for SSAPs do not have enough money for primary surveys.

To address this, it must be recognised that the tables in the SSAP have two distinct purposes: benchmarking and estimation of water consumption for the balance sheet.

For instance, consider industrial water use. The current SSAP template demands facility-level data for benchmarking purposes. Eventually, we do want to compare water use efficiency in individual power plants across the country. But the secondary data available on facilities (e.g. Pollution Control Board filings) tend to be voluntary self-reporting. They are often incomplete or water use is severely under-reported. Similarly, irrigated area estimates in the census and state Annual Crop Survey Reports tend to contradict each other. So what should states do, when the data are completely missing or contradictory?

Presentations from different states reveal some best practices to be followed:

1. **Two-tier approach:** Start from the water balance and try to get to the water balance sheet by focusing on the tables that feed into the water balance and those that serve a benchmarking purpose. If necessary, have different teams pursue these, so that a water balance is actually achieved.

2. **Prioritisation for primary data:** Adopting a "quick and dirty" approach using easily available data sets such as Economic Census, Primary Census and Village Amenities to quickly identify the biggest water using sectors; so that primary surveys could be done on the big water guzzlers. Use the funds to conduct more careful audits of the biggest water use areas.

3. **Blending data types:** A few states are blending secondary data with Earth Observation (satellite) data on land use and land cover to quickly obtain basin wise irrigated area and cropland estimates. Again, some spot field measurements can help improve crop coefficient and irrigation efficiency numbers.

4. **Triangulation:** Using a few different approaches and independent datasets to obtain the same number may help improve confidence.

5. **Closing the water balance:** The main advantage of a water balance approach is that the water balance must close. Evapotranspiration (which has the biggest source of uncertainty) could be tested against MODIS satellite-based ET product. Soil moisture measurements could be used to model actual evapotranspiration. Eventually, all fluxes must be accounted for.

The SSAP exercise of creating water balance sheets is an ambitious one. Clearly, the water balance sheet template is a work-in-progress, to be improved on over time. However, it is a start and it is hoped that the states will not lose momentum.

❑❑❑

ABOUT THE AUTHORS

Dr. Veena Srinivasan and Dr. C.V. Dharma Rao, (Veena Srinivasan is a Fellow at ATREE, Bangalore. Dr. C V Dharma Rao is the Adviser in the National Water Mission. Views expressed are personal.)

To know more about the authors, kindly write to us at: info@thewaterdigest.com