



Food and Agriculture Organization
of the United Nations

Water Scarcity Programme (WSP) for Asia-Pacific

Water scarcity is increasing throughout Asia, even in seasonally wet tropical countries that have historically been viewed as having plentiful water resources. Population growth is the fundamental driver of increasing water scarcity, through demand for more and increasingly varied foods, and associated economic development and the rapid growth of cities and the water services they need.

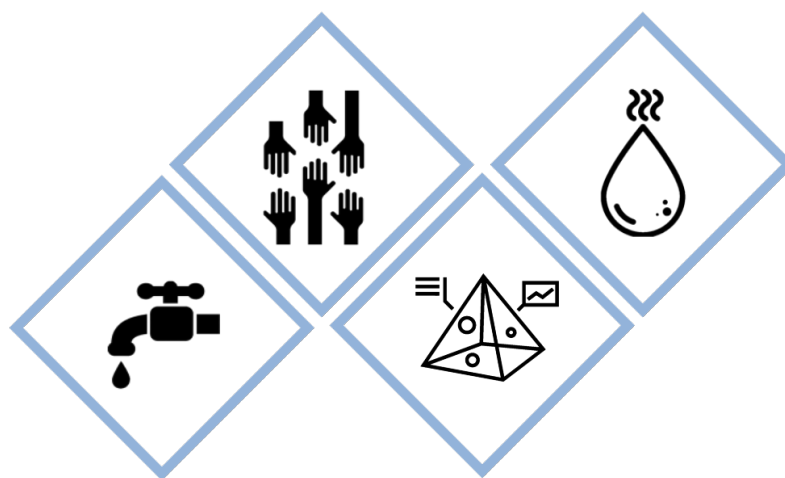
Climate change will both increase demand and reduce or make supply more variable, depending on the precise context. The geographic scope and climatic variability within Asia-Pacific is considerable, as is the variability in population, economic development, political and administrative systems.

Irrigation has been an integral part of the food production system in Asia and consumes 85-95 percent of the water abstracted for human use throughout the region. Competition between water using sectors is rising at local and regional scales. In the future, greater attention will need to be paid to maintaining river flows, their associated ecosystems and their services, which benefit humans directly (for example, coastal fisheries) and indirectly through maintaining biodiversity and healthy landscapes.

FAO adopted a simple definition of water scarcity in the [Coping with Water Scarcity](#) report of 2011

“ **Water scarcity is an excess of water demand over available supply.** ”

The FAO Water Scarcity Programme (WSP) for Asia-Pacific elaborates this into four simple categories: *too little water, too much demand, too much variability and poor water quality.*



As water resources come under increasing pressure, the agriculture sector will have to produce more food with less water. Therefore, the long-term objective of the WSP is to bring agricultural water use within the limits of sustainability and prepare the sector for a productive future with less water.

FAO has been managing a Water Scarcity Initiative for North Africa and the Middle East since 2016 and has promoted and achieved strong regional collaboration both in science and at political and policy levels. FAO in Asia-Pacific is building upon this experience and lessons learned to design a five-year action programme that will focus on practical aspects of water accounting, allocation and associated adaptation in agricultural water management.

Understanding water scarcity in the Asia-Pacific Region

Since the end of 2019, the WSP for Asia-Pacific has been in a scoping phase that draws on a wide range of existing FAO programming work in the region in addition to new work to:

1 **map the temporal and spatial trends of emerging scarcity using global data sets;**

Regional and country analyses of the trends in water scarcity have been undertaken using global climate, land use and topographical data sets in conjunction with global databases on river flows and demographics at a resolution of 55 km. Water scarcity is shown to be rising at different rates and severity in nearly all countries in the region, overwhelmingly due to increases in population.

The impact of climate change on water scarcity trends is so far masked by demographic impacts. Geographic and temporal trends determined for Nepal provided the basis for practical and informative discussions during the national round table, held prior to COVID in January 2020. A draft of a standalone report will be finalised soon, and individual country analyses are included in the policy analysis work.

2 **understand the policy environment for managing water scarcity in a selection of countries in Asia-Pacific;**

A final synthesis of in-depth policy in ten countries¹ is expected by end-2021. The studies examine the policies related to water scarcity and its management and their coherence between sectors and across administrative jurisdictions from national to local levels.

The work includes a detailed characterisation of the ten most important policy instruments (policies, laws, regulations), a set of key informant interviews and a review based on literature and the investigations. The policy work is complemented by an additional set of surveys to understand modelling capacity and the use of water and climate models in water policy development in Asia (seven countries), which should be complete by the end of 2020.

3 **develop a package of new tools for managing water scarcity**

A new and growing suite of tools has been initiated by the WSP to:

1. Understand and communicate the innovative pilot work to allocate and monitor consumptive water use (actual evapotranspiration) in China (new Technical and Policy Guide for Asia to be published in mid-2021);
2. Develop a user-friendly water balance tool based on freely available remote sensing data and supplementary global data sets known as Scalable Water Balance from Earth Observations (SWEQ). Two trainings have been undertaken for SWEQ in Myanmar and Afghanistan and;
3. Better understand how and where real water savings can be made in agricultural production (REWAS tool). The REWAS package includes a comprehensive training programme that has been virtually conducted in Iran, Viet Nam and Malaysia, aligned with a recent publication titled [Guidance on realizing real water savings with crop water productivity interventions](#).

¹ Australia, Bangladesh, Cambodia, Fiji, Indonesia, Lao People's Democratic Republic, Myanmar, Nepal, Thailand, Viet Nam

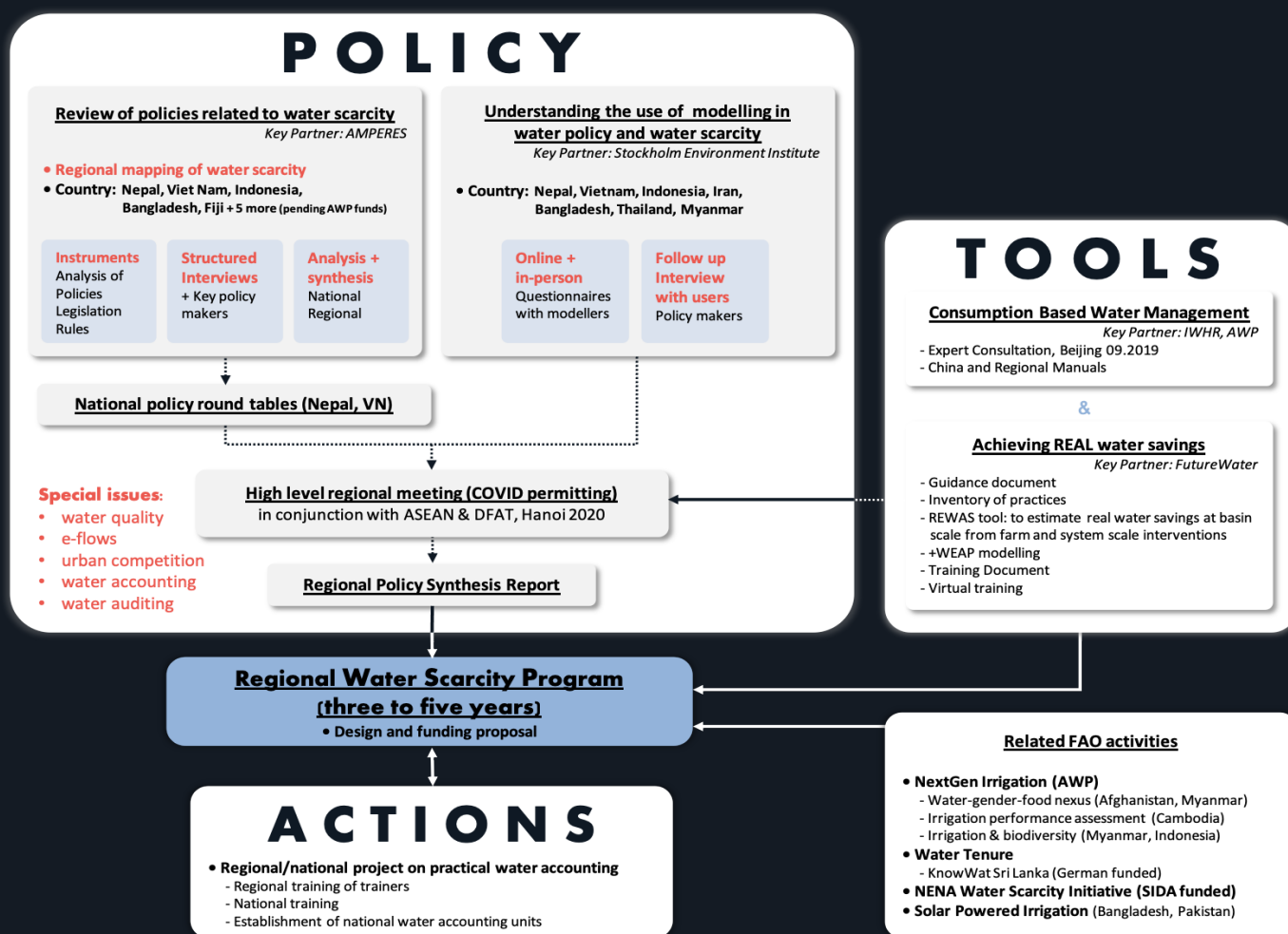


Figure 1: Components of the scoping phase of the WSP¹

A paper outlining FAO's plans to help countries address water scarcity in agriculture was presented to the Asia-Pacific Regional Conference (2020). The strong endorsement was received from a number of countries, in particular, Australia, Japan, Malaysia, Thailand and Viet Nam.

Next steps for the Water Scarcity Programme

The final step of the scoping phase is the development of a draft funding proposal for a five-year Water Scarcity Programme for Asia-Pacific. The proposed work programme has a strong practical focus and will be finalised in light of the results of the scoping phase, which are expected to be completed in end 2021. The work will be conducted across five core programmes, outlined as follows:

¹ COVID-19 has impacted the schedule of work and the proposed regional meeting on Water Scarcity in Asia has been postponed but will be conducted in some form in the coming two years. In place of the planned Regional Forum on Water Scarcity in Hanoi, additional work on water scarcity hotspots is has been in Vietnam to elaborate more detail on aspects of groundwater, urban-agricultural competition for water and the impact of degraded water quality on water availability for different uses.

1. establish routine water accounting in partner countries (tools, processes, people, institutions);

- Establish a core team of regional trainers (hydrology, remote sensing, water accounting, agricultural water management and water tenure).
- Establish, train and support national water accounting units that are cross disciplinary and likely located within planning ministries.
 - Special focus on groundwater where appropriate.
 - Compare model-based approaches with simple hydrometric water balances and ones derived from remote sensing, using global and local data sets. Gradually develop more sophisticated assessments at national, basin and catchment scales.
- Support and refine the application of remote sensing (RS-ET) to water accounting and irrigation/groundwater area management:
- Collate and collect data to properly calibrate and validate RS-ET at basin scale (250-500 m resolution) and farm-scale (10-30 m) by country/sub-region.
- Collaborate with international programmes that generate estimates of water use from remote sensing: FAO WAPOR, EEEFlux, Open ET and others.

2. explore and establish formal water allocation processes;

- Understand water tenure (rights, formal and informal customary use, and de facto (legal and non-legal) use) and its implications for formal water allocation processes.
- Identify and characterise water scarcity hotspots.
- Analyse food security and energy policy and their implications for water use
- Agricultural water demand scenario

analysis – at national and basin level, accounting for climate change impacts on water and agricultural systems.

- Analyse and define bulk water allocations across sectors and between aggregated users within agriculture and environment, based on stakeholder participation and scenario modelling.
- Conduct associated institutional development for formal water allocation – focusing on policy coherence across water-using sectors.
- Establish bulk water allocation processes and monitoring in selected countries.

3. adapting agricultural water management to water scarcity;

- Yield and water productivity benchmarking and gap analysis.
- Identify the most promising interventions and adaptations to address productivity gaps under conditions of water scarcity.
- Assess potential locally recommended and identified practices to make real water savings at catchment and basin scale, using recently developed FAO tools such as REWAS.
- Establish irrigation system performance benchmarking – surface and groundwater.
- Improve crop mapping using remote sensing, particularly in cloud covered conditions (in conjunction with Programme 1.)
- Adjust agricultural water management policies in conjunction with Programme 1 & 2.

4. managing water scarcity in the Pacific;

The Pacific Islands are experiencing rapid population growth with consequent stress on local food systems and on fragile water resources that support drinking, sanitation and industrial needs. Formal irrigation is mostly located on the larger islands and has

historically been limited in scope. All Pacific islands, atolls in particular, are at very high risk from climate change which is directly related to water scarcity.

5. development of a Regional Collaborative Platform (RCP) for Water Scarcity

The WSP will promote regional cooperation in water scarcity management, based on joint technical and research work, complemented by high-level ministerial meetings at key points to ensure buy-in at the highest policy levels. Due to the geographical extent of the Asia-Pacific Region, the number of individual countries (27 in Asia and 21 in the Pacific) and variation in contexts, regional collaborative platforms (RCPs) will be developed for: a) South and West Asia; and b) South East Asia. Regional activities in the Pacific will be designed to work with existing networks such as the Pacific Community (SPC).¹

National multidisciplinary teams (NMDTs) will be established in each country by FAO to guide and liaise between national and project work teams and provide cross disciplinary/sector perspectives and direction. The NMDTs will form the basis of a broad representation of sectors in the regional platform and for direction and coordination of activities.

¹ Building on two new collaborative water projects between SPC and FAO. One with the Australian Water Partnership on water resilience and a large GEF project on groundwater management and governance.

The WSP will establish a regional team of trainers across water accounting, allocation, modelling, the use of remote sensing and understanding water tenure to collectively build capacity and reduce reliance on international consultants. The RCP will foster cooperation on investigative, research and routine activities (water accounting and allocation) and ensure continuity in regional training capacity. It will organise routine exchange of technical and institutional experience and promote the management of water scarcity at a high political level.

A detailed funding proposal is being prepared and the draft will be finalised in light of the findings of the policy and modelling survey work. The draft will be circulated to key regional stakeholders for comments, feedback and endorsement in the third quarter of 2021, before the full engagement with funding bodies.

Contact us

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