



INITIATIVE ON  
Asian Mega-Deltas

# Toward an Integrated Approach to Food Security and Nutrition in Cambodia

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# Key messages

- The Cambodian Mekong Delta is under pressure from changing hydrological regimes, development pressures, increasing population and climate change, which pose threats to the food production systems and food access for millions of people.
- Fragmented water and land management across different food production systems currently cause trade-offs that undermine the production of nutrient-dense food and livelihoods of especially local fishing households. At village and commune levels this includes fragmentation across irrigation infrastructure, Community Fisheries and Community Fish Refuges, with each governed by separate and disconnected institutions.
- A diverse, climate resilient and sustainable agri-food system calls for re-balancing the use of water and land resources between especially rice production and other more nutrient dense foods including fish, through more efficient resource allocation, more equitable food production and consumption opportunities and a reduced environmental impact.
- To ensure that water and land resource use supports diversity, resilience and sustainability in food production, a planning process capable of working across sectors and between sub-national administrative layers is needed, which also operates within hydrological units (basins and sub-basins).
- Such horizontal and vertical integration in resource use planning requires institutional innovation to ensure that decentralized governance occurs not only vertically within sectors, but critically also across sectors such as water, agriculture, fisheries and environment management at the district to village levels to facilitate coordination across local water-land management institutions, ensuring that fisheries is also well reflected.
- Key elements of the D&D process such as Village and Commune Development planning should be re-assessed on how they can better support more coordinated local level water and land use, and integration across local, commune and district governance scales.

Food production in Cambodia's Tonle Sap Lake floodplain requires a more integrated approach to water and land use and a greater focus on nutrition, noting that around 33 percent of Cambodia's population is malnourished (UNICEF 2023). This includes malnutrition rates among children under 5 years, which are the highest in the region. Addressing nutrition gaps critical for human development and productivity in Cambodia is urgent given the current impacts of climate change on agricultural production and productivity. The climate-induced decline and unpredictability of such crucial resources as water and land have caused increasing competition and conflicts among different users. If this is to be reduced, policies on water-land governance need to be better coordinated and local resource planning and management need an integrated resource-use approach.

# Fragmented policies on water-land governance

Policies, strategies and management processes concerning water and land management operate in silos and are not linked cross-sectorally. Further, each resource is governed by many institutions. For instance, four ministries (the Ministry of Water Resources and Meteorology [MOWRAM]; the Ministry of Agriculture, Forestry and Fisheries [MAFF]; the Ministry of Industry, Science, Technology and Innovation [MISTI]; and the Ministry of Rural Development [MRD]) govern different types of water uses (Sithirith 2017). Specifically, irrigation systems are governed by MORAM, while MAFF needs water from irrigation schemes to irrigate rice farming, which needs to coordinate with MOWRAM. MISTI governs clean drinking water in urban areas, while clean drinking water in rural areas is under the jurisdiction of MRD. Despite that, each ministry has different plans and management systems, but their coordination is weak, impacting water uses. Moreover, the management of water and land resources does not comprehensively consider climate risks to the key bodies of these resources.

While the national food security policy stresses the strength of agriculture (particularly rice and fish production) that depends on the synergy between land and water resources (CARD 2019, 2021), sector specific policies are not well-linked. Concerning water governance, national bodies focus on their respective mandates and sectors. For instance, while the Cambodia National Mekong Committee (CNMC) deals with water issues of the Mekong River at the national level and works on water conflict resolution at the regional level, it does not work with the National Committee for Disaster Management (NCDM) and the Tonle Sap Authority (TSA) to address issues related to the interrelated flows of the Mekong River and the Tonle Sap Lake (Ojendal et al. 2023; Sithirith et al. 2024). This shortcoming is concerning since the Mekong River, the Tonle Sap Lake, disaster risks and climate change are deeply linked to agricultural production and food security. The adverse impacts of the Mekong River on the flows of the Tonle Sap Lake (particularly by upstream dams) and subsequently on food production of communities around the lake are evident. Yet, a landscape approach to address the integral issues surrounding land-water resources and climatic risks by CNMC, NCDM and TSA does not exist. Specifically, there is no policy

and institutional mechanism to coordinate the integration of disaster risk reduction and climate change adaptation in agriculture at both national and subnational levels.

This status quo exists despite some efforts to manage water and land resources in an integrated manner. In fact, the Law on Water Resource Management enacted in 2007 adopts the principles of the Integrated Water Resource Management (IWRM) that advocate for the coordination of sector policies and local realities. IWRM is defined as “a process that promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (Agarwal et al. 2000). Hence, IWRM is a holistic approach to the development and management of water, addressing water governance in a broad societal context and providing an approach to build trade-offs between competing demands for water among actors at various levels. Yet, in practice, IWRM is highly technical, and the coordination needed for IWRM is a significant challenge (Sithirith 2017). For instance, despite the IWRM emphasis, MAFF and MOWRAM do not coordinate water governance policies for agriculture (especially concerning irrigation schemes). Furthermore, construction of large irrigation canals without consideration of impacts on other water-dependent production systems such as rice-field fisheries, community fisheries and community fish refuges, illustrates both this siloed culture of planning and the trade-offs that result.

Efforts to synergize the use of water and land resources are also attempted across relevant ministries (CDRI 2023). For example, the Technical Working Group on Agriculture and Water (TWGAW) aims to facilitate cross-sector coordination with a long-term vision to ensure enough, safe and accessible food and water for all people by balancing the use of water for both agriculture and non-farm sectors, while attempting to ensure the sustainability of natural resources. The Technical Working Group on Fisheries (TWGF) aims to achieve a balance between sustainable rice field fisheries and rice production intensification, taking into account a fair and balanced use of water resources. The Technical Working Group on Food Security and Nutrition (TWGFSN), housed at the Council for Agricultural and Rural Development, aims to synergize food-relevant stakeholders' investments to boost food production and enhance nutrition. This involves the production and security of not only rice but also other essential foods such as fish, livestock and vegetables. However, these cross-sectoral bodies have not yet translated into coordination on the ground, where the need of each food production system is addressed in isolation. Poor coordination and conflicts over roles and responsibilities among technical departments are the key constraints in the management of water and related resources in Cambodia (Seng et al. 2013; Phirun et al. 2011; Chea et al. 2011).

# Over-emphasis on rice production at the expense of nutrition

The use of water and land in agriculture has focused on promoting rice production as a poverty reduction, food security and export revenue strategy. While this is understandable, the demand for water resources and impacts on the flow of water in the landscape have contributed to trade-offs that undermine other production systems, associated livelihoods and nutrition security. Rice cultivation areas increased from 2.1 million hectares in 1999 to 3 million hectares in 2018, covering most of the cultivated land and consuming most of the irrigated water (FAO 2020). The increase in rice farming in the dry season has intensified the use of water pumped from rivers and lakes, which has affected the preservation of fish stocks in fish stocks in community fisheries (CFIs) and community fish refuges (CFRs) (Sao, 2023). This has also caused water shortages that lead to conflicts between the different water users. Moreover, irrigation schemes have

altered ecological systems, breaking natural water-land links, barring natural water flows and disconnecting fish migrations from flooded forests, rivers and lakes to rice fields. Coupled with the rising utilization of chemical fertilizers in rice farming, this has led to a dramatic decrease in rice field fish.

The over-emphasis on rice production obscures the importance of fisheries that significantly contributes to food and nutrition of rural households. For example, 23 percent of the Tonle Sap Lake floodplains, spanning more than 350,000 ha, are used for agriculture, mainly rice production (Marcaida III et al. 2021). This has affected the aquatic catch in rice fields and canals (i.e. fish, crabs, snails etc.), which is an important source of food and nutrition for local communities (MAFF 2017). Inland fish capture decreased from 527,795 tonnes in 2017 to 383,300 tonnes in 2021 (MAFF 2022). Since more than 60 percent of Cambodia's freshwater fish come from the Tonle Sap Lake (Brooks and Sieu 2016), the significant use of water and land from the Lake for rice cultivation trivializes fish production that is needed to improve nutrition of small-scale farmers (Sao 2023). Yet, the decreasing volume of floodwater reaching the rice fields and the increasing use of fertilizers in rice cultivation have significantly lessened the catch. Moreover, fisheries and its productivity are not included in water use plans of farmer water user committees (FWUCs) that manage and distribute water for rice farming.

# Community conflicts over water use

This compartmentalized approach to water management also results in competition and conflicts over water use at community level, particularly tensions between water conservation for fish production and water use for agriculture due to poor coordination between various community-based organizations (CBOs). These issues are illustrated in Boeung Sneh Reservoir and Boeung Phlang CFR, involving how to balance the interests of fish production and agricultural irrigation (Sao 2023). A similar problem occurs in Boeng Ream CFR and Ta Soung irrigation scheme. The irrigation canals are connected to four CFIs and there is an ongoing conflict over water use between FWUCs and the CFIs. Water scarcity caused by climate change and a lack of a clear irrigation schedule or proper operation of the sluice gates along the canals leads to conflicts between upstream and downstream water users. Other cases involve conflicts over keeping water levels in community fish refuges for fish production and allocating water from the ponds for rice farming and rice field fisheries (Ojendal et al. 2023). Disputes over keeping a community pond for fish conservation, for clean drinking water or selling the pond to outsiders also manifest in local communities. Often, conflicts happen among members of resource-specific CBOs and/or between different CBOs such as FWUFWUCs, CFIs, CFRs and CFs.

In an effort to harmonize resources at the sub-national level, the government has decided to integrate water, agriculture and environment management at the district level to reduce the fragmentation in planning and implementation (World Bank 2021). This reform incorporates all 13 line ministry offices and their 55 functions to the district level. Under this unified administration, line ministries are expected to no longer operate in a “silo-structure”. This model, if effectively implemented, can enable the district authorities to promote more integrated water resource planning to better meet the needs of multiple food producers. While this is an important shift towards more integrated planning, some challenges remain. First, fisheries is not explicitly included in the integration. Second, the national and provincial authorities remain sectoralised, making the resource synergy at the district level difficult. Another challenge is the capacities as officers move from linear sectoral thinking to integrated and more systemic views of resource landscapes. Finally, this requires information systems that would enable an integrated/multiple-use understanding of resource landscapes and how to make trade-offs of resource use.

Another promising initiative is the renewed revitalization of agricultural communities to make them comprehensive and competitive (Diepart et al. 2022). These agricultural communities, which have members depending on various resources (such as land, water, fisheries and forests), have potential to reduce community conflicts over water-land resource use. Working with the unified district authorities, they could improve local resource planning and management and reduce competition and conflicts among different resource-specific CBOs.

# Policy recommendations

To improve nutrition security, sustainability and climate resilience in Cambodia's food production systems, it is imperative to:

- Reframe objectives that go beyond rice and embrace other main diets such as fish and vegetables.
- Adopt a more holistic approach to water and land management based on hydrological units, resource inventories, and trade-off analyses.
- Include fisheries in the current integration of water, agriculture and environment management at the district level to reduce the fragmentation in planning and implementation of resource use.
- Pilot test a district-level Technical Working Group involving stakeholders across relevant sectors, representatives from local government institutions and CBOs responsible for local water management, to facilitate integrated approaches to resolving community disputes over water use and water use in food production.
- Use funds from commune development plans to invest in implementing local integrated water management plans.
- Engage with integrated agricultural communities to further facilitate coordinated water management and reduce community conflicts over water-land resource use.



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