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Decentralised Food System Governance at the District Level in Cambodia

Studying the Performance of District Technical Working Groups in Boeng Sneh (Mekong Delta) and Boeng Ream (Tonle Sap)

Mak Sithirith, Sanjiv de Silva, Sok Sao, Chhaing Marong,
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Disclaimer

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List of acronyms and abbreviations

ACs	Agricultural Cooperatives
ADB	Asian Development Bank
AMD	Asian Mega-Deltas
CARD	Council for Agricultural Research and Development
CBET	Community-Based Ecotourism
CBO	Community-Based Organisation
CCWC	Commune Committee for Women and Children
CDF	Commune Development Fund
CDP	Commune Development Plan
CDRI	Cambodia Development Resource Institute
CFi	Community Fishery
CFR	Community Fish Refuge
CIP	Commune Investment Plan
DANRE	District Office of Agriculture, Natural Resources and Environment
DP	Development Partner
DTWG	District Technical Working Group
DWG-FSN	District Working Groups on Food Security and Nutrition
EU	European Union
FGD	Focus Group Discussion
FiAC	Fisheries Administration Cantonment
FSN	Food Security and Nutrition
FWUC	Farmer Water User Community
IFReDI	Inland Fisheries Research and Development Institute
IWMI	International Water Management Institute
KII	Key Informant Interview
M&E	Monitoring and Evaluation
MAFF	Ministry of Agriculture, Forestry and Fisheries
MISTI	Ministry of Industry, Science, Technology and Innovation
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MOE	Ministry of Environment
MOWRAM	Ministry of Water Resources and Meteorology
MR	Mekong River
MRD	Ministry of Rural Development
NCDD	National Committee for Sub-National Democratic Development
NGO	Non-Governmental Organisation
NSFSN	National Strategy for Food Security and Nutrition
PDAFF	Provincial Department of Agriculture, Forestry and Fisheries
PDOE	Provincial Department of Environment
PDRD	Provincial Department of Rural Development
PDWRAM	Provincial Department of Water Resources and Meteorology
PWG-FSN	Provincial WGs on Food Security and Nutrition
RAqFS	Resilient Aquatic Food Systems
SAAF	Sustainable Animal and Aquatic Foods
TKIS	Taing Krasaing Irrigation System
TSL	Tonle Sap Lake
TWG-FSN	Technical Working Group on Food Security and Nutrition

Executive summary

This working paper examines the experiences of two pilot sites—Boeng Sneh Lake in Prey Veng and Boeng Ream Lake in Santuk District, Kampong Thom—to promote the integrated management of these multi-functional ecosystems. This work, commencing in 2023, was implemented under the Asian Mega-Deltas (AMD) and Resilient Aquatic Food Systems Initiatives, now advancing through the CGIAR Scaling for Impact Program (S4I) and Sustainable Animal and Aquatic Foods (SAAF) led by WorldFish, IWMI and in partnership with the Inland Fisheries Research and Development Institute (IFReDI), the Council for Agricultural Research and Development (CARD), the Cambodia Development Resource Institute (CDRI) and district and provincial authorities. The paper provides an in-depth analysis of how District Technical Working Groups (DTWGs) function as institutional innovations for integrated aquatic ecosystem management to support decentralised and resilient food system production, by assessing their achievements, challenges, and lessons learned in the management of water, fisheries, agriculture, and natural resources within complex floodplain ecosystems.

Cambodia's floodplains—especially those surrounding the Tonle Sap Lake and Mekong Delta—sustain millions of rural livelihoods through interconnected systems of rice farming, fisheries, and wetland ecology. However, these landscapes are increasingly threatened by hydrological alteration, competing resource uses, climate change and siloed resources governance. Multiple ministries—Ministry of Water Resources and Meteorology (MOWRAM), Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Environment (MOE), Ministry of Rural Development (MRD), Ministry of Land Management and Urban Planning and Construction (MLMUPC) and Ministry of Industry, Science, Technology and Innovation (MISTI)—have overlapping mandates, resulting in weak coordination and recurring water conflicts especially between irrigators and fishers.

To address this fragmentation, two pilot DTWGs were established in August 2024 as coordination bodies that bring together provincial and district departments, commune councils, community-based organisations (CBOs) such as Farmer Water User Communities (FWUCs), Community Fisheries (CFis), Community Fish Refuge (CFR) committees, and Agricultural Cooperatives (ACs), under the leadership of the district governor. The DTWGs provide a structured platform for cross-sectoral planning, participatory management, and consensus-based decision-making aimed at restoring ecological balance while improving food, water, and livelihood security.

Key achievements

- **Improved water security and ecological restoration:** Through coordinated planning, the Boeng Sneh DTWG facilitated increased dry-season water retention by 28 percent (32 million m^3) across three districts, while reducing water-use conflicts by more than 60 percent. In Santuk, the DTWG mobilised provincial funds for rehabilitating 4.5 km of canals, expanding irrigation access to over 1,150 ha and 3,000 households. Both lakes reported ecological recovery through fish stock replenishment, wetland vegetation restoration, and biodiversity conservation through annual fish-release campaigns and community patrolling.
- **Strengthened irrigation management and local financing:** DTWGs improved transparency and accountability in local water management, including financing. In Santuk, irrigation fee collection rose by 27 percent, reflecting improved farmer confidence and shared maintenance responsibility. Commune Development Funds (CDFs) co-financed canal desilting and repairs, while provincial departments provided technical oversight.

- **Institutionalised multi-stakeholder governance:** DTWGs have evolved into inclusive platforms connecting government agencies, communities, and development actors. Boeng Sneh's DTWG links four districts, while Santuk's DTWG anchors inter-commune coordination around Boeng Ream. Both groups are now integrated into Provincial WGs on Food Security and Nutrition (PWG-FSN) and formally recognised by the CARD as pilot District Working Groups on Food Security and Nutrition (DWG-FSN). Participatory monitoring data generated by DTWGs were integrated into Cambodia's 3rd National Strategy for Food Security and Nutrition (NSFSN 2024–2028) as case evidence for multi-sectoral water governance
- **Enhanced capacity, learning, and collaboration:** Over 400 participants (including 88 women) from provincial, district, and community levels participated in training on participatory planning, gender inclusion, and hydrological management. DTWG Telegram groups facilitated rapid communication and monitoring, while cross-learning exchanges between Boeng Sneh and Boeng Ream strengthened adaptive governance.
- **Transformed natural resources governance culture at district-to-local levels towards collaborative resource management:** A fundamental shift toward a collaborative, cross-sectoral culture is observed that underpins the development and implementation of site management plans, including securing government funds and collectively engaging with water users such as rice farmers to build farmer awareness and commitment to change irrigation practices. This collaborative approach stands in stark contrast to the prior siloed practices, fostering a better understanding of challenges as multi-dimensional and thus shared.
- **Enhancing women's voices:** The inclusion of the Commune Committee for Women and Children (CCWC) in DTWG structures institutionalised gender-responsive planning. Female participation in DTWG activities and decision-making, such as monthly DTWG meetings and provincial dialogues, increased from under 7 percent to 15 percent by 2025. Women advocated successfully for domestic water and small aquaculture initiatives, improving household nutrition and income.
- **Reduced drivers of social conflict:** Representation of FWUCs, CFis, CFRs, and ACs through DTWGs ensures that both farmers and fishers participate in decision-making, reducing social and ecological conflict. This ability to collectively respond to challenges will be key to these communities' capacity to address future variations in natural resource flows, especially water, as climate change exacerbates the impacts of upper riparian actions in the Mekong Basin.
- **Contributes to completing the vertical institutional architecture for implementing the Third National Strategy on Food Security and Nutrition:** While these pilot DTWGs facilitate field-level solutions by bringing together local-to-district government and community actors, their performance has prompted the Council for Agricultural Research and Development to establish District Working Groups for Food Security and Nutrition (DWG-FSN) in Santuk and Ba Phnom Districts. These DWG-FSNs are the formal mechanisms for connecting the existing WG-FWSNs at national and provincial scales to the DTWGs, which will now become sub-WGs under a DWG-FSN. Taken as a whole, these layers of national, provincial and now district WG-FSN, along with the sub-WGs under the DWG-FSN for managing specific aquatic ecosystems, provide a complete multi-actor, multi-scale institutional framework for more integrated planning and action for food sector policy delivery.

Key challenges

Despite major improvements in water and ecosystem management, several challenges persist:

- **Institutional fragmentation:** Ministries continue to operate under overlapping mandates, limiting full integration of water, fishery, and agricultural management. Coordination remains reliant on project facilitation rather than permanent administrative procedures. These challenges at higher level exert negative impacts on DTWG performance.
- **Financial constraints:** DTWGs lack dedicated operational budgets and depend heavily on donor support. Commune Development Funds are limited, and FWUC fee collection remains inconsistent.
- **Capacity gaps:** DANRE and commune administrations face shortages in technical expertise, data management, and monitoring tools, constraining evidence-based planning.
- **Gender and youth participation:** Although improved, women's representation in leadership and technical roles remains minor, and youth involvement is minimal.
- **Sustainability Risks:** Without clear institutional mandates or budget lines, DTWGs risk weakening after project cycles end.

Key lessons learned

- **Across sectoral integration is achievable from the community level upwards:** The DTWG model demonstrates that coordinated governance can emerge organically when local administrations convene multiple agencies under shared mandates.
- **Participation enhances compliance and trust:** Inclusive decision-making involving farmers, fishers, and the commune leaders encourages transparency and integrated solutions that reduce resource conflicts.
- **Data sharing is transformative:** Joint hydrological mapping and reporting by Provincial Department of Water Resources and Meteorology (PDOWRAM), PDAFF, and community groups build a common evidence base for planning, reducing the scope for conflict based on uncertainty.
- **Gender inclusion strengthens resilience:** When women's councils contribute to planning for improved water management, there will be more water for rice farming and household consumption, which reduce the household expenditure and women's time for families, which reflect household water and food security needs.
- **Provincial endorsement ensures sustainability:** Formal integration of DTWGs into CARD and PWG-FSN structures provides legitimacy and pathways for scaling nationwide and builds the sub-national structure. The PTWG and the DTWG operations will attach funds to support its works at the provincial and district levels/administrations.

1. Introduction

Cambodia's floodplains—particularly the Tonle Sap and Mekong Delta regions—form the ecological and economic heart of the country's food systems. These lowland landscapes sustain millions of rural livelihoods through their intertwined functions of rice cultivation, inland fisheries, and water provisioning for domestic and agricultural use. Yet, over the past two decades, the very productivity of these floodplains has been increasingly undermined by chronic water conflicts, land use changes, changes in farming practices, and fragmented resource governance. Competing demands between irrigated agriculture, fisheries, livestock, and household water consumption have intensified, especially under conditions of climate variability, changing hydrological regimes, and expanding irrigation infrastructure. The cumulative effects have been the degradation of multi-functional wetland ecosystems, the loss of fish habitats, soil depletion, declining water quality, and a weakening of the ecological resilience that traditionally supported Cambodia's food and livelihood security.

These tensions erode the multi-functionality of Cambodia's floodplain ecosystems. Lakes and wetlands that once simultaneously supported agriculture, biodiversity, fisheries, livestock and domestic water needs are increasingly converted or degraded. Boeng Sneh in Prey Veng and Boeng Ream in Kampong Thom exemplify this trend. Once naturally connected to seasonal flood regimes, both sites now experience irregular water inflows and conflicts between community fish refuges and irrigation demands. This fragmentation reduces ecosystem sustainability and productivity, undermines local food and income security, and weakens social cohesion among water users.

A key driver of these resource conflicts is the fragmented governance system that manages Cambodia's natural resources. At the institutional level, these tensions are rooted in sectoral and centralised governance arrangements that divide responsibility for water, land, agriculture, and fisheries management among multiple ministries—the MOWRAM, MOE, and MRD. While each agency has advanced its own programmes—such as FWUCs under MOWRAM, ACs under MAFF, and CFis and CFRs under the Fisheries Administration—coordination between them has remained weak. While these mechanisms represent progress in participatory governance, they often operate in isolation, driven by narrow focuses, insular institutional cultures, and lacking mechanisms for coordination across sectors and spatial scales. This institutional fragmentation produces siloed decision-making, overlapping mandates, and at times, direct competition for access to shared water and land resources, especially during the dry season. The absence of integrated planning among these entities leads to overlapping jurisdictions, competing claims over water and land, and the neglect of ecosystem interdependencies. The result is a siloed and fragmented approach that compromises the sustainability of Cambodia's food systems (Sithirith et al. 2024a).

Recognising these structural weaknesses, the Royal Government of Cambodia issued a 2019 sub-decree encouraging integrated management of water, land, agriculture, and environment at the district level. Building on this policy shift, WorldFish and IWMI, in collaboration with the Inland Fisheries Research and Development Institute (IFReDI), Cambodia Development Resource Institute (CDRI) and district authorities, launched pilot DTWGs in Boeng Sneh (Prey Veng) and Santuk (Kampong Thom) under the AMD Initiative of CGIAR in 2024 (AMD Initiative 2024). The DTWGs were designed as multi-stakeholder governance platforms that institutionalise cooperation between government agencies, community, and technical actors at the district level. Each DTWG is chaired by the district governor, ensuring alignment with subnational administrative structures, and includes representatives from Departments

of Water Resources and Meteorology (PDOWRAM), Agriculture, Forestry and Fisheries (PDAFF), Environment (PDOE), and Rural Development (PDRD), Fisheries Administration Cantonments (FiACs), District Office of Agriculture, Natural Resources and Environment (DANRE), Commune Councils and village chiefs, and CBOs, including FWUCs, CFis, CFR committees, ACs, and CBET groups.

Through this inclusive composition, DTWGs serve as integrated governance mechanisms that move beyond the traditional sectoral silos. Their core mandate is to facilitate the joint planning, coordination, and monitoring of activities related to water, fishery, land, and agricultural systems within a shared ecological landscape. In practice, this means harmonising irrigation schedules with fish refuge management, resolving conflicts over water use between farming and fishing communities, and aligning local interventions with broader provincial and national policies on food security, climate resilience, and biodiversity conservation.

Crucially, the DTWGs have also evolved into learning and coordination spaces that foster dialogue across administrative levels and professional disciplines. Regular meetings, shared data platforms, and participatory lake management planning processes have enabled members to collectively analyse problems, design solutions, and monitor outcomes. In doing so, the DTWGs are reshaping institutional culture—promoting trust, transparency, and cooperation among agencies and communities that historically worked in isolation. As early evidence from Boeng Sneh and Santuk demonstrates, these platforms are laying the groundwork for integrated decentralised food system governance through collective management of the ecosystems in which food systems are embedded - a model that seeks to restore ecosystem functionality while enhancing food, water, and livelihood security for Cambodia's floodplain populations.

2. Analytical framework and methodology

2.1. Purpose and approach

This analytical framework is designed to assess how DTWGs on Boeng Sneh in Prey Veng and Boeng Ream in Santuk District in Kampong Thom perform as institutional innovations for integrated decentralised food system governance (Figure 1). The study examines both institutional effectiveness and governance transformation, focusing on whether DTWGs foster inclusive, transparent, and coordinated management of natural resources across ecosystem, administrative and sectoral boundaries. The analysis combines qualitative institutional assessment and stakeholder-based evaluation, using the DTWG framework developed by WorldFish, IWMI, CDRI, and IFReDI in 2024 as part of the Asian Mega-Deltas, Resilient Aquatic Food Systems Initiatives (AMD Initiative 2024).

2.2. Geography and ecosystem of Boeng Sneh and Boeng Ream

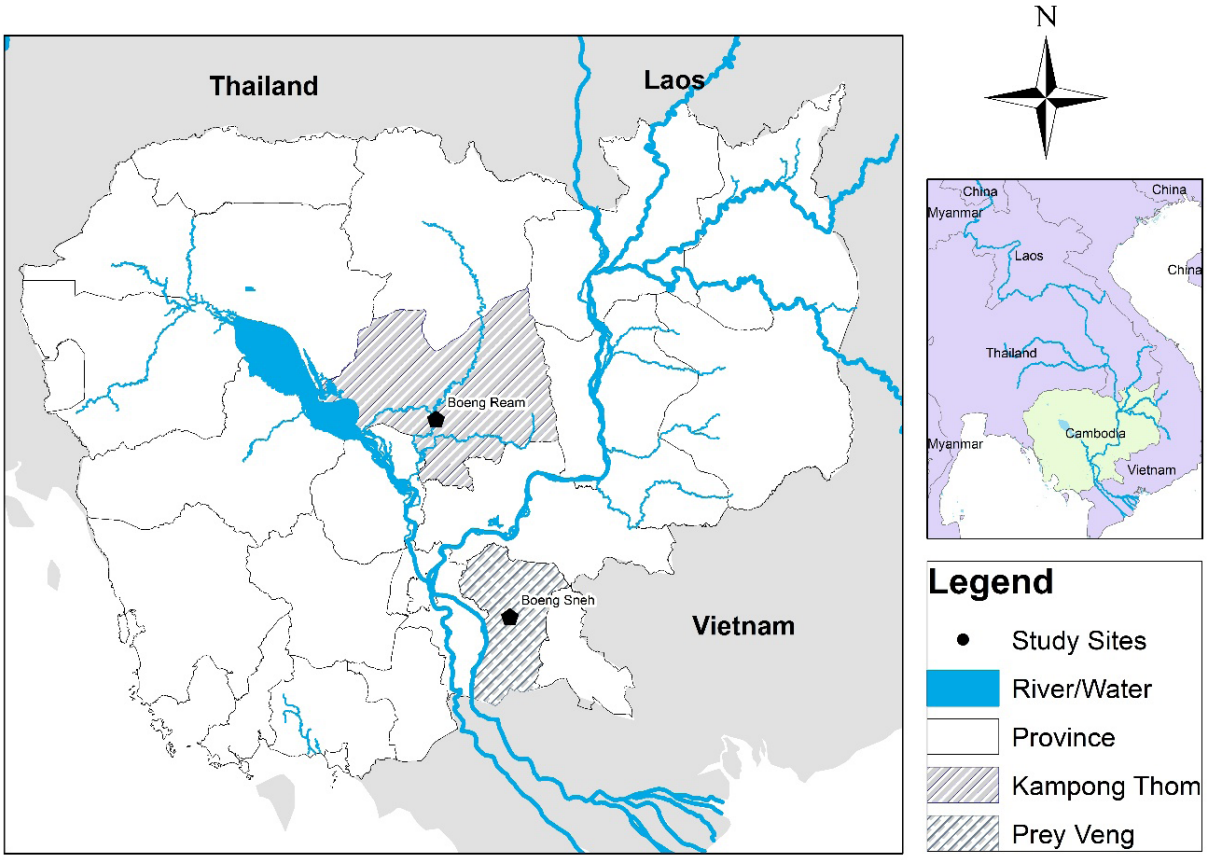
Boeng Sneh and Boeng Ream are two vital ecological systems that include water bodies, river networks, fishery ecosystems, rice fields, irrigation systems, and human communities. Water serves as a crucial link connecting landscapes from upstream to downstream, yielding fish that sustain livelihoods. Boeng Sneh, the expansive freshwater lake in Prey Veng, is a cornerstone for the local community, providing essential resources that support diverse livelihoods, particularly through water, fisheries, and agriculture. The thriving fishery not only serves as a primary source of protein for families but also plays a significant role in the local economy through market engagement. Additionally, the lake's water is indispensable for irrigation, enabling farmers to cultivate rice and other crops crucial for food security in the region (Sithirith et al. 2024a). The ecosystem services provided by Boeng Sneh—including water filtration, wildlife habitat, and flood regulation—are integral to maintaining ecological

balance and supporting the livelihoods reliant on its resources. These resources are particularly important as both lakes supply vital food to local, district, and provincial markets, thereby bolstering the regional economy.

Similarly, Boeng Ream supports approximately 3,300 households across ten villages, offering a rich array of ecosystem services that strengthen local economies. This lake is renowned for its biodiversity, which is essential to freshwater fisheries and to various aquatic plants harvested for consumption and trade. Fishing remains a primary source of income for many families, while water from the lake supports irrigation for rice paddies, allowing farmers to grow crucial crops that sustain their families and contribute to the local economy.

Both Boeng Sneh and Boeng Ream are essential ecosystems that underpin agriculture and fisheries, playing a critical role in local food security and livelihoods. Integrated Water-Land Resources Management (IW-LRM) provides a holistic framework to address these challenges, promoting coordinated development for both economic and ecological sustainability (Sithirith et al. 2024b). Boeng Sneh encompasses four districts in Prey Veng: Ba Phnom, Peam Ro, Svay Antor, and Prey Veng City. In contrast, Boeng Ream is situated within a single district of Santuk, in Kampong Thom Province. The management strategies for both Boeng Sneh and Boeng Ream should extend beyond administrative boundaries, focusing instead on a landscape approach that emphasises connectivity, productivity and ecosystem functions. This approach will address both ecological needs and human requirements for current and future generations (Cascio and Beilin 2010).

Figure 1: Map of the study sites



Source: Adapted and modified by authors

Utilising a landscape approach in the management of Boeng Sneh and Boeng Ream is vital for safeguarding ecosystem functions, fostering connectivity, enhancing ecosystem services, and ensuring human security linked to these thriving ecosystems. An improved hydrological regime in Boeng Sneh promotes the development of fish breeding sites within the flooded forests and defends the lake's water body against land encroachment, while also sustaining wetlands year-round as a healthy habitat for birds and promoting biodiversity in the Toulporn Taley Boeng Sneh bird sanctuary. These habitats are crucial not only for aquatic life and avian species but also in supporting local human populations, offering untapped potential for eco-tourism. Similarly, in Boeng Ream, enhanced hydrological conditions and the creation of fish breeding habitats within the Boeng Ream CFR contribute to the resilience of the ecosystem. Preserving these environments is essential for maintaining biodiversity and ensuring the harmonious coexistence of fisheries and agriculture (Sithirith et al. 2024a).

2.3. Core dimensions of performance

The framework evaluates DTWG performance across five interrelated dimensions (Figure 2):

(1) Stakeholder representation and inclusiveness

This criterion measures the diversity and balance of participation within DTWG structures, encompassing government agencies, community-based organisations, private actors, and vulnerable groups, including women and smallholders. Key indicators include the number and diversity of stakeholder institutions that are formally represented within DTWGs, as well as the frequency with which these actors participate in meetings and decision-making processes.

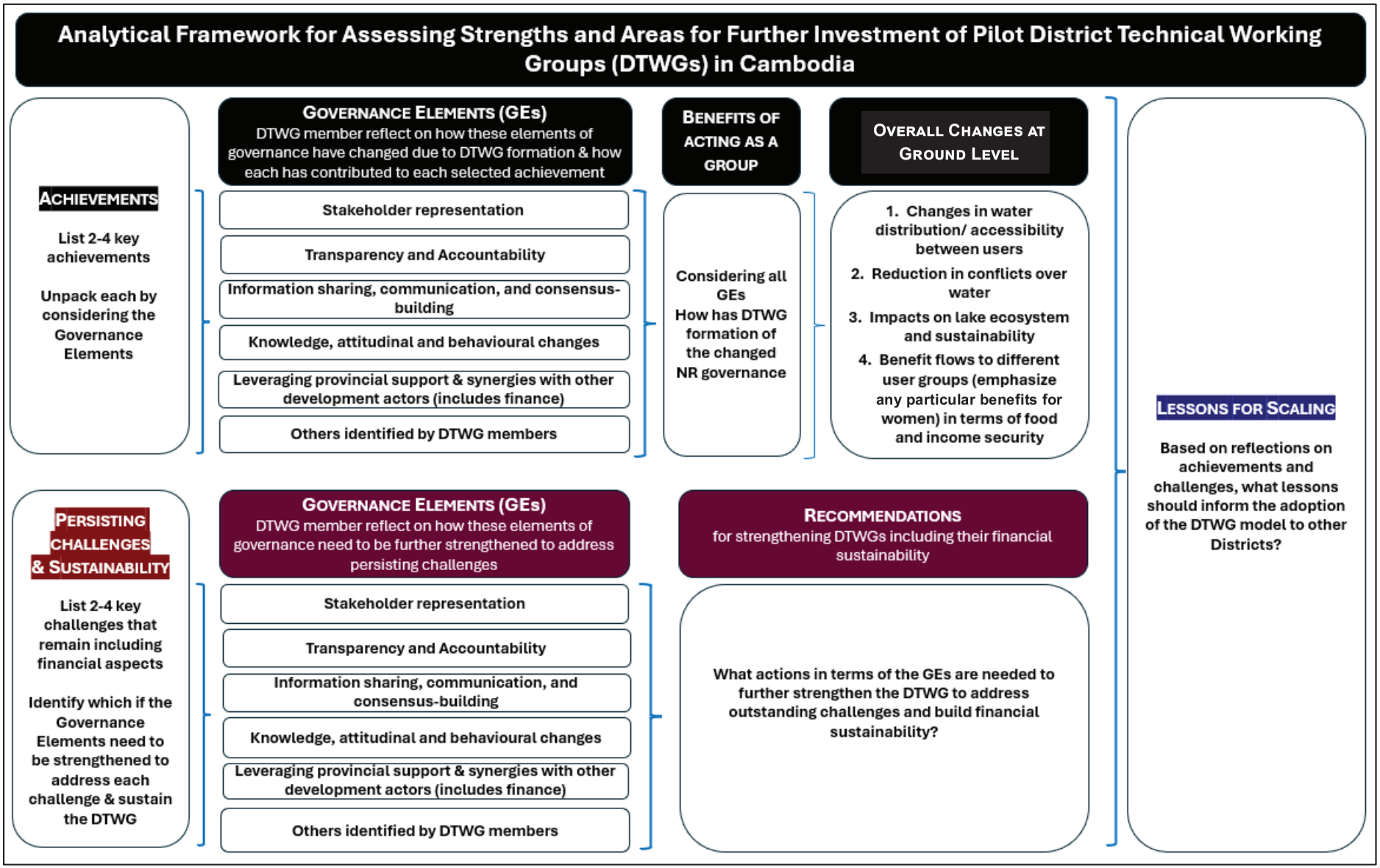
The assessment also considers the extent of gender and social inclusion in leadership roles, examining whether women and marginalised groups hold meaningful positions of influence rather than symbolic representation. In addition, attention is given to the mechanisms in place to ensure community voice and feedback, such as consultation processes, grievance channels, or regular reporting back to local constituencies, which collectively shape the inclusiveness and legitimacy of DTWG governance. Effective representation ensures that decision-making reflects local realities and strengthens vertical and horizontal accountability within decentralised governance systems.

(2) Coordination, integration, and responsiveness

DTWGs are evaluated primarily on their capacity to synchronise sectoral plans across water, agriculture, fisheries, and environmental management, and to translate these diverse inputs into coherent, district-level strategies. This evaluation focuses on how effectively DTWGs move beyond parallel sectoral planning to create integrated approaches that reflect the interdependencies of shared ecosystems and livelihoods.

Key assessment indicators include the frequency and quality of joint planning meetings, as regular, well-facilitated interactions are essential for building shared understanding and aligning priorities across sectors. Equally important is the extent of cross-sector participation in the development of management plans, which signals whether water, fisheries, agriculture, and environmental actors are genuinely collaborating rather than merely consulting one another.

Figure 2: Analytical framework for assessing strengths and areas for further investment of pilot DTWGs in Cambodia



Source: Compiled by authors

Performance is also measured by the timeliness and coordination of implementation of shared actions, such as irrigation scheduling, community fish refuge protection, and the operation of watergates. These activities require close coordination across agencies and user groups, particularly in highly seasonal and hydrologically variable contexts. DTWGs are further assessed on their responsiveness to emerging conflicts and seasonal variations, including their ability to mediate competing water and resource demands and to adjust plans in response to floods, droughts, or changing livelihood needs.

High-performing DTWGs demonstrate adaptive coordination in practice, using these mechanisms to transform fragmented sectoral interventions into integrated management of shared ecosystems. Through sustained collaboration, timely decision-making, and flexible responses to change, such DTWGs contribute to more coherent governance outcomes and improved resilience of district-level food, water, and fisheries systems.

(3) Transparency and accountability

Transparency within DTWGs refers to the openness of their decision-making processes and the extent to which decisions are clearly communicated, formally recorded, and subject to monitoring by both members and affected communities. Effective transparency ensures that stakeholders can understand how priorities are set, how resources are allocated, and how agreed actions are progressing, thereby reducing information asymmetries and mistrust.

Accountability, in turn, concerns the mechanisms through which DTWGs ensure compliance with jointly agreed rules, plans, and operational decisions. This includes the public disclosure of meeting minutes and key decisions, which allows community members and partner institutions to scrutinise outcomes and follow up on commitments. Accountability is further strengthened through the establishment of monitoring committees at the commune or community level, creating downward and horizontal oversight that links district coordination with local implementation.

The use of digital communication platforms—such as Telegram groups or shared online reporting forms—also plays an increasingly important role in supporting both transparency and accountability. These tools facilitate timely information sharing, real-time coordination, and accessible documentation of actions and responsibilities across sectors and administrative levels. In addition, evidence of sanctions or corrective measures applied in cases of non-compliance signals that agreed rules are meaningful and enforceable, rather than merely symbolic.

Together, these practices enable DTWGs to operate in a transparent and accountable manner, which in turn builds institutional legitimacy. When stakeholders can see decisions, monitor implementation, and trust that rules are applied fairly, they are more likely to engage consistently and invest in long-term, cross-sectoral collaboration.

(4) Behavioural and institutional change

This dimension evaluates the extent to which DTWGs have fostered a transition from siloed, sector-specific practices toward more collaborative governance behaviour among both state actors and community stakeholders. Rather than focusing solely on formal structures, this assessment examines changes in everyday interactions, decision-making norms, and patterns of cooperation that signal deeper institutional transformation.

Key indicators include shifts in perception and cooperation among line departments, particularly the degree to which agencies recognise interdependencies and view coordination as mutually beneficial rather than as a loss of autonomy. Willingness to share data and jointly coordinate

plans is another critical marker, reflecting increased trust and a move away from information hoarding toward collective planning and evidence-based decision-making.

The evaluation also considers the extent to which DTWGs enable collective problem-solving during conflict situations, such as disputes over water allocation, fisheries access, or seasonal resource scarcity. In such contexts, collaborative forums provide space for negotiation, mediation, and the co-production of solutions that balance competing interests. Additionally, the creation of joint monitoring or enforcement activities—bringing together multiple departments and community representatives—demonstrates practical collaboration beyond planning and into shared implementation.

(5) Sustainability and institutionalisation

The final dimension examines the durability and scalability of DTWG mechanisms within Cambodia's broader governance architecture. This assessment considers the extent to which DTWGs are formally recognised by higher-level coordination bodies, including the PWG-FSNs and the National Technical Working Group on Food Security and Nutrition (TWG-FSN), operating under the frameworks of the CARD and the National Committee for Sub-National Democratic Development (NCDD).

Durability is further reflected in the allocation of district budget lines or the establishment of cost-sharing mechanisms that support DTWG operations, signalling financial ownership beyond externally funded projects. The assessment also examines the degree to which DTWG priorities are integrated into Commune Development Plans (CDPs) and Commune Investment Plans (CIPs), ensuring alignment between district-level coordination and commune-level planning and investment decisions.

Scalability is strengthened where DTWG activities and priorities are clearly linked to national policy frameworks, such as the National Strategy for Food Security and Nutrition, the Nationally Determined Contribution, and the Pentagonal Strategy. Sustainable DTWGs are therefore embedded within existing administrative and planning systems, enabling them to function effectively and adaptively beyond the lifespan of individual projects or donor funding cycles.

2.4. Methodological process

a) Data sources

The assessment draws on data gathered from multiple DTWG activities and sources. These include a review of DTWG meeting minutes and attendance sheets covering the 2024–2025 period, as well as analysis of the management plans developed for Boeng Sneh and Boeng Ream.

Primary qualitative data were collected through key informant interviews (KIIs) with district governors, officials from PDOWRAM and PDAFF, and leaders of community-based organisations (CBOs). In addition, focus group discussions (FGDs) were conducted with members of Farmer Water User Communities (FWUCs), Community Fisheries (CFis), and Community Fish Refuges (CFRs) to capture local perspectives and lived experiences of DTWG processes.

The assessment was further complemented by a systematic review of relevant documents, including DTWG partner terms of reference (ToRs), success stories, and policy briefs, which provided contextual and institutional insights into DTWG operations and outcomes.

b) Analytical techniques

A mixed-method approach was applied in the assessment. This included institutional mapping to understand actor linkages and coordination pathways, alongside content analysis of meeting records to evaluate the quality and inclusiveness of decision-making processes. The analysis also involved thematic coding of interview data to capture changes in attitudes, levels of cooperation, and patterns of local problem-solving over time.

In addition, a comparative scoring system was used based on five performance dimensions, each scored on a scale from 1 to 5 (low to high), to enable systematic comparison across DTWGs and assessment criteria.

c) Evaluation timeline

The study covers the period January 2024–October 2025, corresponding to the pilot implementation under the Asian Mega-Deltas and Resilient Aquatic Food Systems Initiatives, which is now advancing under CGIAR Scaling for Impact (S4I) and Sustainable Animal and Aquatic Foods (SAAF) programme. Both qualitative and quantitative data were triangulated to validate findings and to identify systemic patterns of strengths, gaps, and opportunities for future scaling.

2.5. Analytical logic and interpretation

The analytical framework emphasises that DTWG performance is contextual and iterative rather than static. It does not measure success solely by output indicators (e.g., number of meetings or projects completed) but by governance transformation—the degree to which institutional behaviours, relationships, and power dynamics evolve toward collaboration, inclusion, and shared accountability.

Performance is therefore interpreted through a combination of complementary evaluative lenses. A process-based evaluation examines how decisions are made and negotiated, focusing on the quality of participation, deliberation, and coordination within DTWG processes. An outcome-based evaluation assesses how coordinated actions reduce conflicts and enhance ecosystem services, reflecting the immediate and medium-term effects of collaboration across sectors.

In addition, an impact-oriented evaluation considers how DTWGs contribute to longer-term goals, including improved food security, strengthened climate resilience, and more equitable livelihoods. Together, these perspectives provide a comprehensive understanding of DTWG performance across procedural, operational, and strategic time horizons. This interpretive framework aligns with contemporary governance theories emphasising co-production, adaptive management, and social learning as essential drivers of resilience in complex socio-ecological systems.

3. Findings and analysis: Key achievements

WorldFish, IWMI, IFReDI, CDRI, and District Authorities in Prey Veng and Santuk in Kampong Thom undertook the pilots in Boeng Sneh and Boeng Ream to innovate the integrated decentralised food system governance at the district level. The Pilot Project (It) has provided support to three districts (Ba Phnom, Peam Ro, and Svay Antor) in Prey Veng and Santuk District in Kampong Thom to manage the Boeng Sneh and the Boeng Ream, respectively, at the district levels. Through the pilots and working relationships with stakeholders and local communities at the respective sites, it draws the following lessons and innovations.

3.1. The DTWGs for Boeng Sneh and Boeng Ream

Boeng Sneh and Boeng Ream have distinct institutional dimensions and mandates. The MOWRAM is tasked with managing water resources by developing and overseeing irrigation systems. MOWRAM delegates the governance of these irrigation schemes to the PDOWRAM and establishes FWUCs to oversee water usage at the local level (RGC 2008; MOWRAM 2024).

The MAFF is responsible for utilising the water from Boeng Sneh and Boeng Ream lakes to irrigate rice farming and support other agricultural activities. To facilitate this, MAFF collaborates with MOWRAM to draw water from these irrigation systems. Additionally, ACs are formed by MAFF to enhance agricultural activities within communities. Within MAFF, the Fisheries Administration (FiA) manages fisheries, establishing CFis and Community Fish Refuges (CFRs) to strengthen the governance of fishery resources at the local level. Similarly, the MISTI oversees clean drinking water in urban regions, while the MRD is responsible for ensuring access to clean drinking water in rural areas, further complicating the overall framework for water management. On the ground, these agencies establish mechanisms and institutional frameworks to carry out their mandates in Boeng Sneh and Boeng Ream, each operating with unique plans and management systems (Chanrith et al. 2024).

Ministers from MOWRAM, MAFF, and MRD have jointly issued a statement promoting coordination and collaboration among these ministries to facilitate the sharing of water resources for agriculture and rural development (Khmer Times 2024; EAC News 2024). The Cambodian government is making strides towards decentralising the governance of natural resources by establishing the DANRE. This decentralised approach seeks to enhance the integration and effectiveness of various community-based initiatives, including community fisheries, fish refuges, farmer water user communities, community-based ecotourism, agricultural corporations, and private water supply systems (RGC 2019). However, despite the establishment of DANRE, the management of water and land resources often remains fragmented, with policies, strategies, and management processes functioning in isolation across different sectors and institutions, such as water, agriculture, fishery, and irrigation. Additionally, DANRE faces constraints in technical, human, and financial resources, compounded by power dynamics, making the governance of Boeng Sneh and Boeng Ream a significant challenge (Chanrith et al. 2024).

Boeng Sneh supports four CFis that emphasise sustainable fishing practices and community engagement alongside two FWUCs responsible for managing irrigation schemes vital for agriculture, particularly during the dry season. Additionally, it features one CBET initiative, which is essential for safeguarding the flooded forest surrounding the lake. This forest is crucial for sustaining both the fishery and the diverse bird populations thriving in the wetland, recognised as a site of national wetland significance. However, management of water-land resources in the Boeung Ream and Boeng Sneh Lakes is significantly hampered by fragmentation and overlapping jurisdictions among various government bodies. This complexity stems from a historical context in which different ministries were established with distinct mandates, resulting in a governance structure that lacks cohesion and control over resources for its intended purpose. The absence of clear guidance and coordination mechanisms at the district level has led to decentralised governance systems functioning in isolation, with each sector or community initiative operating independently rather than adopting an integrated approach to natural resource management. Such a fragmented governance structure can impede the overall effectiveness and efficiency of natural resource management (Sithirith et al. 2024b), as it fails to adequately consider the synergies and trade-offs between different sectors.

An integrated decentralised institutional framework has been established to guide and support the governance of natural resources, including water, fisheries, land, and agriculture in Boeng Sneh and Boeng Ream. The DANRE is responsible for enhancing the governance of these resources in the area. However, their effectiveness is hindered by a lack of experience, capacity, and resources. To address the above issues, the DTWGs have been established to foster coordination among stakeholders and facilitate the development of integrated management plans that take into account ecological, social, and economic factors. By bringing together diverse perspectives, the DTWG aims to improve resource management, empowering local communities while promoting sustainable practices that benefit both the environment and the people reliant on these resources.

3.2. The performance and the achievements of the DTWGs in Prey Veng and Kampong Thom

The DTWGs were established in August 2024 to mobilise collective actions from various stakeholders and technical provincial and district governments to address the issues undermining the Boeng Sneh Lake and Boeng Ream CFR. The DTWGs facilitate collective stakeholder dialogues between local communities, local government, technical departments and development partners. In doing so, they identified the natural resource use problems facing the Boeng Sneh Lake and Boeng Ream CFR that impact both ecosystem sustainability and performance and food production and he livelihoods of local communities. The DTWGs have prioritised these problems and developed management plans for Boeng Sneh Lake and Boeng Ream CFR by consulting diverse community stakeholders to achieve consensus-based decision-making among government agencies, local authorities, communities, and experts. Provincial dialogues were also organised to present these plans to provincial governments, whilst, subsequently, national dialogues were organised to present the innovations and models of this multi-actor ecosystem approach for the governance of water, land, and natural resources at the district level.

Following the establishment of DTWGs and their performance for the safeguards of the Boeng Sneh and Boeng Ream, the study has identified four areas of achievements: (1) Improved Water Security and Ecological Restoration; (2) Strengthened Irrigation Management and Local Financing in Santuk, Kampong Thom, and Boeng Sneh in Prey Veng; (3) Institutionalised Multi-Stakeholder Governance Platforms; and (4) Enhanced Capacity and Cross-Learning for Integrated Resource Management (Table 1). These achievements represent a major governance and ecological success in floodplain resource management, demonstrating how DTWGs can bridge institutional gaps, coordinate diverse stakeholders, and generate measurable environmental recovery. Improving irrigation efficiency and local financial sustainability has been a central governance success of the DTWGs in both Boeng Ream in Santuk District, Kampong Thom, and Boeng Sneh Lake in Prey Veng. Through collaborative coordination, district-level leadership, and participatory financial planning, these DTWGs have restored critical irrigation infrastructure, improved water-use efficiency, enhanced revenue collection for system maintenance, and established stronger linkages between water governance, local finance, and ecological conservation. The most enduring success of the DTWGs has been their institutionalisation as formal multi-stakeholder governance mechanisms at the district level. The DTWGs in Boeng Sneh and Santuk have established a dynamic culture of learning, knowledge exchange, and institutional capacity development, transforming technical coordination into adaptive governance. From 2023–2025, more than 403 participants (including 88 women) from district administrations, provincial departments, commune councils, and community organisations participated in structured learning cycles and reflection workshops.

These capacity-building processes deepened collective problem-solving skills, improved coordination between sectors, and built the social infrastructure necessary for integrated resource management across the two provinces.

3.2.1. Stakeholder representation and inclusiveness

Two TWGs have been established to support DANREs in its efforts of integrated water, land, and natural resources governance at the district level. The Boeng Sneh Technical Working Group (BS-TWG) consists of 23 members from three districts—Ba Phnom, Peam Ro, and Svay Antor—along with representatives from relevant concerned provincial departments, including three female members (Table 2). This group is chaired by the district governor of Ba Phnom and includes representatives from the three District Offices of DANRE, PDOWRAM, PDAFF, PDOE, and the FiAC, as well as members of FWUCs, CFis, CFRs, and CBETs. The Boeng Ream Technical Working Group (BR-TWG), also chaired by the district governor, comprises 16 members from the District Office of Santuk, DANRE, PDOWRAM, PDAFF, FiAC, as well as commune chiefs, village chiefs, and representatives from commune police, FWUCs, and CFRs (Table 2).

The TWGs provide platforms for provincial departments, district authorities, the DANRE, Commune Authorities, village Chiefs, FWUCs, CFRs, and concerned stakeholders to meet and discuss issues affecting Boeng Sneh and Boeng Ream. It also provides venues for stakeholders to consider and plan the future development of both lakes. It also builds a culture of working together at the district level and fosters collective trust and action at the local level.

Table 1: The key achievements of the DTWGs measured by the governance elements

Achievement	Stakeholder representation	Transparency and Accountability	Information sharing, communication, and consensus-building	Knowledge, attitudinal and behavioural changes	Leveraging provincial support and synergies with other development actors
1. Improved Water Security and Ecological Restoration	The DTWGs at Boeng Sneh and Boeng Ream brought together provincial, district, and community actors. Over 10,911 households around Boeng Sneh and 3,325 households around Boeng Ream benefited from improved water access and reduced conflicts.	Regular monthly DTWG meetings—chaired by district governors and co-facilitated by PDOWRAM. In Boeng Ream, transparency was demonstrated through open reviews of FWUC irrigation fees, which increased by 27 percent (from KHR 57,143,800 to KHR72,538,000 between 2024–2025) due to stronger accountability and farmer confidence in system maintenance.	Participatory tools—such as problem tree analysis, hydrological mapping, and Telegram communication groups—helped DTWG members jointly analyse causes of water shortages and identify context-specific solutions. In Boeng Sneh, DTWG's cross-district coordination among Ba Phnom, Peam Ro, and Svay Antor enabled the lake to retain 32 million m^3 of dry-season water in 2024, a 28 percent increase compared to 2020–2023.	The DTWGs fostered a cultural shift from competition to cooperation among farmers, fishers, and officials. Farmers now understand the trade-offs between dry-season rice expansion and water sustainability, adjusting cropping schedules accordingly to maintain water levels for aquatic biodiversity and fisheries.	Both DTWGs effectively mobilised provincial and external resources. Participatory monitoring data generated by DTWGs were integrated into Cambodia's Third National Strategy for Food Security and Nutrition (NSFSN 2024–2028) as case evidence for multi-sectoral water governance.
2. Strengthened Irrigation Management and Local Financing in Santuk	In Santuk, stakeholders include the PDOWRAM, PDAFF, FiAC, district governor's Office, Commune Councils, FWUCs, and CFRs. In Boeng Sneh, similar institutional composition includes PDOWRAM, FWUCs, CFis, and CCWC.	In Santuk, irrigation rehabilitation and financial flows were openly discussed and verified in DTWG meetings. The FWUC irrigation fee collection increased by 27 percent (from KHR57,143,800 in 2023 to KHR72,538,000 in 2024–2025) due to improved transparency and trust in management. In Boeng Sneh, similar accountability mechanisms were applied through regular DTWG reviews, commune-level budget discussions, and joint inspections of irrigation gates. Farmers and FWUCs participated directly in financial oversight committees.	In Boeng Sneh, this multi-level coordination across three districts enabled joint scheduling of pumping periods and equitable access to water for over 10,911 households, significantly reducing cross-commune disputes. At Santuk, improved communication between FWUCs and CFis prevented dry-season over-pumping, safeguarding Boeng Ream's Community Fish Refuge ecosystem.	Farmers began to perceive irrigation as a *shared responsibility* rather than a free public service. Increased willingness to pay fees and participate in canal maintenance reflected this shift. FWUC and CFi leaders improved collaboration, co-developing joint irrigation calendars that protected crops, aquatic biodiversity and fisheries.	CARD and the PWG-FSN formally endorsed DTWG action plans, integrating them into provincial and national investment frameworks. Commune Development Funds (CDFs) co-financed canal desilting and small gate repairs, while communities contributed labour.

Achievement	Stakeholder representation	Transparency and Accountability	Information sharing, communication, and consensus-building	Knowledge, attitudinal and behavioural changes	Leveraging provincial support and synergies with other development actors
3. Institutionalised Multi-Stakeholder Governance Platforms and a collaborative management culture	Representation evolved from participation to co-governance—where community and state actors share decision-making power and jointly implement plans. Quantitative evidence: Over 80 active DTWG members across the two provinces (32 in Santuk, 48 in Boeng Sneh) now represent an integrated structure connecting provincial, district, and commune institutions, including diverse sector agencies.	Institutionalisation introduced formal procedures for planning, monitoring, and reporting under the district administration. This procedural consistency builds consistency and transparency in institutional operation and trust: DTWG decisions are traceable, auditable, and publicly verifiable, a departure from the previously informal coordination culture.	Shared Telegram groups link commune chiefs, district officers, FWUC leaders, and FiAC technical staff, enabling rapid updates on water conditions, fish catch data, and enforcement actions. Participatory mapping and joint monitoring—facilitated by WorldFish and IWMI—generate shared spatial knowledge on water flows, fishing zones, and irrigated command areas. DTWG workshops use consensus-building methodologies, including "problem-tree analysis" and "visioning" exercises, to align sectoral objectives and prioritise cross-cutting interventions.	Government officers transitioned from directive roles to facilitative and collaborative approaches, recognising the value of community input. Community leaders gained confidence in engaging technical agencies and articulating livelihood priorities during formal planning meetings. District governors now view natural resource governance not as isolated administrative duties but as cross-sectoral systems requiring integration.	The Provincial WG-FSN in both provinces formally endorsed the DTWGs, aligning them with provincial investment priorities and national food-security frameworks. CARD recognised DTWGs as pilots for the District Working Group for Food Security and Nutrition (DWG-FSN) model, enabling policy scaling and institutional support.
4. Enhanced Capacity and Cross-Learning for Integrated Resource Management	Government agencies: PDOWRAM, PDAFF, PDOE, and FiAC officers trained in hydrological monitoring, participatory planning, and gender mainstreaming. District and commune officials: District governors, commune chiefs, and Women's Councils participated in training on facilitation, conflict mediation, and integration of water and livelihood plans into Commune Investment Programmes (CIPs). Community-based organisations: FWUCs, CFis, CFR committees, and agricultural cooperatives gained practical skills in joint planning and environmental monitoring.	DTWG members learned to maintain standardised documentation, such as meeting minutes, progress reports, and joint field inspection forms. Public information boards at commune offices display key outputs, including water schedules, irrigation fee summaries, and budget allocations. DTWGs adopted joint monitoring templates, enabling multiple departments and community representatives to track infrastructure quality, maintenance schedules, and ecological outcomes simultaneously.	Regular reflection and cross-learning workshops enabled DTWGs from Boeng Sneh and Santuk to exchange field experiences on irrigation governance, community financing, and fishery management. Telegram and WhatsApp channels facilitated real-time communication among PDOWRAM engineers, FWUC leaders, and commune chiefs for water management updates. Participatory tools. Overall, the DTWGs provided a space for stakeholders from different sectors to appreciate each other's needs.	District and provincial officers now perceive resource governance as *integrated and interdependent*, balancing irrigation, fisheries, and ecological priorities. Farmers and fishers began seeing water and lake management as shared responsibilities rather than government obligations, resulting in voluntary cooperation and compliance with seasonal water-use rules.	The PWG-FSN formally recognised Boeng Sneh and Santuk DTWGs as pilot learning hubs for integrated food and water governance. CARD offered mentoring on adaptive governance, gender integration, and policy linkage. Commune Development Funds (CDFs) and local contributions supported logistics for meetings and peer-learning exchanges.

Source: Compiled by authors

Table 2: Members of the Technical Working Groups

Membership	Boeng Sneh		Boeng Ream		Total
	Male	Female	Male	Female	
1. District government	1	1	2	0	4
2. District Agriculture Office	4	0	3	0	7
3. Fishery Cantonment	1	0	1	0	2
4. Provincial Department of Agriculture, Forestry and Fisheries	0	1	1	0	2
5. Provincial Department of Water Resources	1	0	1	0	2
6. Provincial Department of Environment	0	1	0	0	1
7. Commune authorities	6	0	1	0	7
8. Village chief	0	0	4	0	4
9. FWUC Representatives	3	0	1	0	4
10. Cfi representatives	2	0	0	0	2
11. CFR representative	0	0	0	1	1
12. Community-based biodiversity conservation	2	0	0	0	2
13. Commune police	0	0	1	0	1
Total	**20**	**3**	**15**	**1**	**39**

Source: Compiled by authors

The Boeng Sneh DTWG demonstrates high stakeholder diversity and robust community participation. It includes district and commune councils, PDOWRAM, PDAFF, PDOE, and PDRD, as well as representatives from FWUCs, CFis, CFRs, and ACs. The DTWG also ensures the participation of women's groups through the CCWC, who articulate household water and livelihood priorities. Attendance records show an average 80–85 percent participation rate in quarterly meetings, reflecting strong engagement. At the community level, the DTWG facilitated inclusive consultations during the formulation of the Boeng Sneh Management Plan (2025–2029), where local fishers, farmers, and commune officials jointly mapped hydrological zones, identified fish refuge areas, and agreed on seasonal water-sharing schedules.

The Santuk DTWG also features balanced stakeholder representation, though with slightly lower community participation compared to Boeng Sneh. Its structure includes the Santuk district governor as chair, PDOWRAM and PDAFF as key technical leads, and active representation from community fish refuge and irrigation groups around Boeng Ream. However, female participation remains limited in both DTWGs—estimated at 7–15 percent of total DTWG membership—indicating a need for stronger gender mainstreaming. Still, DTWG has succeeded in bringing communities together through shared planning sessions on water and fishery resource management. Women have been supported by DTWG actions, for example, by striking a balance between water extraction and water left in the lake, and by sustaining fisheries that support livelihoods.

3.2.2. Coordination, integration, and responsiveness

The DTWGs comprise members from different agencies and levels within the province. With funding support from WorldFish and IWMI, the DTWGs are chaired by the Deputy district governors of Ba Phnom in Prey Veng and Santuk in Kampong Thom. The DTWGs meet

every 3–6 months to discuss issues affecting the Boeng Sneh and Boeng Ream Lakes. In these meetings, members review monthly progress and develop responses to new issues by combining their technical and field-level understanding to ensure water is available for ecosystem health, biodiversity and diverse local uses.

Through this approach, cross-sectoral coordination among agencies and stakeholders was improved. In addition to the quarterly meetings, Telegram groups were established for each DTWG to share information and notify members of upcoming events. Other information, such as canal damage and the technical and legal frameworks, is being shared in these Telegram groups, enabling quick discussion of responses and coordinated actions. Immediate responses are often taken up by competent agencies, for instance, the water conflicts and the illegal fishing in Boeng Sneh, and the illegal pumping of water from the Boeng Ream CFR. Furthermore, DTWG members have worked to integrate the management plans for Boeng Sneh and Boeng Ream into the CDPs and the CIPs.

The Boeng Sneh-DTWG has made significant progress in cross-sectoral coordination, integrating fisheries conservation and irrigation management through joint planning mechanisms. Key achievements include: (i) The synchronisation of irrigation gate operations between PDOWRAM and FWUCs to protect CFis during critical fish spawning months (June–August); (ii) Joint monitoring of illegal water abstraction and seasonal flood control by DTWG members, local communes and district authorities; and (iii) Integration of the DTWG's lake management actions into Commune Investment Plans (CIPs) of Svay Antor and Ba Phnom Districts. This integration has reduced water conflicts within the communities and improved water availability for rice farming and fishing (Table 3).

The Santuk's DTWG also achieved improved coordination among district departments, though technical integration remains more limited. A district-wide plan aligning water usage in Boeng Ream with agricultural calendars and CFR zones: (i) DTWG coordination mechanisms were initially enabled by the project through facilitation, capacity building, and the establishment of communication tools such as Telegram groups. The project supported participatory planning, evidence generation, and trust-building across agencies and communities but did not direct operational decisions; (ii) Over time, DTWG members assumed ownership: they actively maintain communication channels, collectively decide on responses to illegal fishing or water misuse, and negotiate water-management arrangements with farmers and fishers. Enforcement actions are carried out by mandated authorities in accordance with DTWG consensus. Overall, outcomes are now DTWG-driven, with the project playing a catalytic and enabling role rather than a directive one; and (iii) DTWG members act together to stop illegal fishing or to engage farmers on water-management decisions. These actions are initiated, decided, and implemented by DTWG members themselves—including district authorities, commune councils, FiAC officers, FWUCs, and CFR committees—based on their collective discussions and legal mandates. Coordination between PDAFF and PDOE for biodiversity conservation along Boeng Ream's flooded forests. However, coordination mechanisms rely heavily on project facilitation and lack formalised reporting lines to the Provincial WG-FSN, affecting long-term institutional coherence (Table 3).

The evidence strongly supports the impression that DTWG members are active agents rather than passive project beneficiaries, with the project playing a facilitative and catalytic role rather than a directive one. DTWG members—drawn from district government, PDOWRAM, PDAFF, FiACs, commune administrations, FWUCs, CFR committees, and CFis—regularly convene, raise issues, debate trade-offs, and agree on collective actions. In Boeng Sneh and Boeng Ream/

Santuk, members themselves identified priority problems, including illegal fishing, declining dry-season water levels, irrigation–fisheries conflicts, and weak accountability in irrigation fee management. Decisions to adjust irrigation schedules, coordinate patrols, or engage farmers are made through DTWG discussions and consensus, and implementation is carried out by institutions with legal mandates (e.g., FiACs, commune councils, FWUCs), not by the project.

The project's contribution has been to create the conditions that enable DTWGs to function effectively, particularly during their early phase of establishment. This has included setting up DTWG structures and regular meeting routines under district leadership, ensuring that coordination mechanisms are formally anchored within local administrative systems. The project also introduced participatory tools such as problem-tree analysis, hydrological mapping, and joint field assessments, which helped stakeholders develop shared understandings of challenges and solutions. In parallel, it supported trust-building among agencies that had previously worked in silos, fostering more open communication and collaboration. Finally, the project strengthened documentation, learning, and reflection processes, enabling DTWGs to capture lessons, monitor progress, and adapt their approaches over time.

Importantly, the project does not direct operational decisions, enforcement actions, or negotiations with farmers; it supports DTWG members to do so themselves.

Telegram groups were initially set up with project support to improve rapid communication and transparency. However, they are not maintained or managed by the project. DTWG members now actively use these groups to share water-level updates, report illegal fishing incidents, coordinate patrols, circulate meeting decisions, and follow up on agreed actions. Commune chiefs, FiAC officers, and FWUC leaders post independently, indicating that these digital tools have become DTWG-owned coordination mechanisms rather than project communication channels.

When DTWG members act together to stop illegal fishing or engage farmers on water management, the project is not involved in implementation. Such actions are triggered by DTWG discussions and real-time information shared among members. The DTWG provides coordination and legitimacy, while enforcement and engagement are carried out by responsible authorities and community institutions. The project's role is limited to having previously strengthened coordination protocols and capacities that make such joint action possible.

Overall, the activities observed—regular communication, joint monitoring, collective responses to illegal activities, and farmer engagement—are DTWG-driven outcomes. The project has functioned as an enabler and catalyst, helping establish platforms, skills, and trust, but DTWG members themselves now drive decisions and actions based on their own discussions, mandates, and shared accountability.

Table 3: The assessment of the coordination, integration and the responses of DWTGs

Criteria	**Boeng Sneh**	**Boeng Ream/Santuk**
Cross-sectoral coordination	High	Moderate
Integration into local planning (CIPs/CDPs)	Strong	Partial
Responsiveness to water conflicts	High	Moderate
Regularity of coordination meetings	Quarterly	Irregular (every 3–6 months)

Source: Compiled by authors

3.2.3. Transparency and accountability

The establishment of DTWGs has clarified the roles and responsibilities of sectoral agencies. The MOWRAM and PDOWRAM are responsible for managing irrigation systems and establishing the FWUCs to oversee local water use. FWUCs manage water distribution from main to secondary and tertiary canals and collect water fees to fund irrigation canal rehabilitation. The PDAFF provides technical support to farmers, including advice on climate-resilient rice varieties, pesticides, and fertilisers. At the commune level, PDAFF works with Commune Agricultural Extension Officers to deliver extension services and has developed climate-resilient agricultural plans for crop production. The Agricultural Cooperative facilitates agricultural business opportunities and improves market access for farmers. FiACs oversee fisheries in rice fields and water bodies such as Boeng Sneh and Boeng Ream Lakes. CFis and CFRs have been established in Boeng Sneh and Boeng Ream to promote fishery protection and conservation.

At the district level, the DANRE employs staff responsible for agriculture, water and irrigation, and environmental management. Agricultural staff within DANRE collaborate with PDOWRAM, while water and irrigation staff also coordinate with PDOWRAM. FiACs and FACs have not yet integrated their personnel into DANRE, so they continue to work directly with communities, commune administrations, and DANRE. Commune administrations lack direct responsibilities for water, irrigation systems, or fisheries and therefore do not provide direct support to communities in these sectors.

In the process of identifying and prioritising issues affecting Boeng Sneh and Boeng Ream, particularly those related to water for rice farming, fisheries, and the management of irrigation systems and watergates, DTWGs have begun to examine the roles and responsibilities of each institution. In Boeng Sneh, the DTWG evaluated the function of spill-over dikes in Boeng Sneh Lake and proposed raising them by 0.2 to 0.3 metres to increase water storage during the dry season. The authority to implement this proposal remains with PDOWRAM at the provincial level. The DTWG has been able to follow up with effective action by PDOWRAM, though implementation has been incremental and institutionally constrained rather than immediate.

The DTWG also expressed concerns about illegal fishing in Boeng Sneh Lake, which adversely affects fisheries and bird conservation, and requested intervention. Meeting minutes and decisions are documented and regularly shared with member agencies and communities through commune offices and Telegram groups. Commune chiefs have recognised the DTWG for improving accountability in the management of irrigation fees and community funds. Following concerns about illegal fishing in Boeng Sneh Lake, the DTWG used its platform to coordinate FiAC, commune chiefs, community patrol teams, and conservation actors, clarifying roles and response procedures. Monitoring improved through DTWG-enabled coordination: alerts and observations are now shared in real time via Telegram groups, joint field checks are organised more rapidly, and patrol activities are better synchronised across communes. This has reduced fragmented enforcement and improved coverage (Table 4).

In Santuk District, the DTWG has reviewed the roles of FWUCs in managing the opening and closing of watergates in the Taing Krasaing Irrigation System (TKIS) and overseeing the collection and management of water fees, particularly in relation to the irrigation system and Boeng Ream Community Fish Refuges (CFRs). A new chief of FWUCs for TKIS has been appointed and has assumed responsibilities. In mid-2025, approximately four kilometres of irrigation canals in Kakoh Commune were rehabilitated with funding from PDOWRAM, ensuring that water from the main canal reaches the terminal canals and the Boeng Ream

CFRs. These improvements have reduced water conflicts between upstream and downstream farmers. However, transparency mechanisms remain under development and have not yet been institutionalised. Although meeting minutes are recorded, they are not consistently disseminated to the broader public. Commune leaders report that limited feedback mechanisms between district-level discussions and community members continue to constrain accountability (Table 4). The shortcomings in public dissemination and feedback reflect structural, institutional, and capacity-related constraints, rather than a lack of commitment by DTWGs. First, DTWGs are coordination platforms, not formal public-information bodies. While minutes are systematically recorded and shared among member institutions, there is no formal mandate or standard operating procedure requiring public disclosure at the commune or village level. As a result, dissemination depends on individual commune leaders' initiative, leading to inconsistency—stronger in Boeng Sneh than in Boeng Ream/Santuk. Second, capacity and resource limitations constrain outreach. Commune offices often lack staff time, printing budgets, notice boards, or digital skills to translate district-level discussions into accessible community feedback, particularly in Boeng Ream, where digital tools are less used. Third, feedback mechanisms remain weakly institutionalised. Communication is largely one-way (district → commune), with limited structured processes for communities to respond, question, or influence follow-up actions. This reflects the early stage of DTWG institutionalisation, especially in Santuk. Finally, digital asymmetry matters. Boeng Sneh DTWG benefits from consistent Telegram use and reporting, while limited connectivity and familiarity in Boeng Ream reduce transparency and accountability. These gaps highlight the need for clearer mandates, standardised disclosure practices and strengthened two-way communication mechanisms.

Table 4: The criteria of the assessment of transparency and accountability

Criteria	Boeng Sneh	Boeng Ream/Santuk
Transparency of processes	Strong	Moderate
Public access to meeting records	Regular	Occasional
Accountability mechanisms	Established	Emerging
Use of digital tools	Consistent (Telegram, reports)	Limited

Source: Compiled by authors

3.2.4. Behavioural and institutional change

The integrated landscape approach to improving the governance of water, agriculture, fisheries, irrigation, and natural resources has led to the establishment of DTWGs. This approach moves beyond siloed management practices by fostering cross-sectoral collaboration. Through DTWG activities and meetings, new cultures of cooperation are established, enabling stakeholders from various levels and offices to communicate effectively. As a result, Boeng Sneh and Boeng Ream Lakes are increasingly viewed as a single ecosystem encompassing water, fisheries, agriculture, and natural resources. Effective governance of these lakes, therefore, requires institutions to collaborate for long-term sustainability.

Collaboration through DTWGs enables representatives from various line agencies to recognise the value of diverse expertise in addressing the complex challenges facing Boeng Sneh and Boeng Ream Lakes. Siloed approaches are insufficient for managing these complexities. Joint efforts facilitate data and information sharing to support practical actions, reduce institutional conflicts, and foster learning and cooperation.

The Boeng Sneh case demonstrates a significant cultural shift in local governance practices. Line departments that previously operated independently now co-design management activities

and share data. PDOWRAM and PDAFF have coordinated joint inspections of water gates and fisheries protection areas, while commune councils and FWUCs jointly manage conflict resolution. These interactions exemplify a new mode of collaborative behaviour and problem-solving, reducing institutional fragmentation.

In Santuk, behavioural change is emerging among agencies at the district and provincial levels, and between FiACs, PDAFF, PDOWRAM, the commune administration, and the district government, but it is still less consolidated. While departmental cooperation has improved, dependency on external facilitation remains high. Still, the DTWG has generated awareness among district officers about the importance of integrated planning and has encouraged more regular communication among line agencies (Table 5).

Table 5: The assessment criteria for behavioural and institutional changes

Criteria	Boeng Sneh	Boeng Ream/Santuk
Interdepartmental collaboration	Strong	Moderate
Conflict resolution culture	Emerging institutional norm	Occasional
Data-sharing and co-learning	Regular	Limited
Independent initiative	Increasing	Still externally driven

Source: Compiled by authors

Weaker starting conditions and fragmented technical baselines: In Santuk, agencies such as PDAFF, PDOWRAM, and FiAC had historically worked in parallel on irrigation, fisheries, and enforcement, with no shared hydrological data, joint maps of watergates, or common planning calendar. For example, PDOWRAM focused on canal operations linked to the TKIS, while FiAC addressed fisheries issues separately, often after problems had already occurred. Unlike Boeng Sneh—where cross-district lake management created an early habit of joint analysis—Santuk lacked prior experience in collectively diagnosing water shortages, spill-over impacts, or fisheries trade-offs.

Integrated practices not yet institutionalised in daily operations: Although DTWG meetings improved dialogue, coordination remains event-based rather than routine. In practice, irrigation scheduling, patrol planning, and budget preparation are still largely conducted within sectoral hierarchies. For instance, joint field inspections or data sharing on water levels and fish habitats often occur only when facilitated by the project, rather than being automatically triggered by seasonal changes. This contrasts with Boeng Sneh, where agencies increasingly initiate coordination themselves in response to emerging risks (e.g., dry-season water stress).

High dependence on external facilitation and weak internal incentives: In Santuk, DTWG meetings, documentation, and follow-up actions still rely heavily on external facilitation, technical inputs, and logistical support. District officers report that without project-supported facilitation, convening multiple departments is difficult due to competing workloads and the absence of a formal mandate or budget line for DTWG operations. As a result, while awareness of integrated planning has increased, ownership has not yet fully shifted from project-driven processes to internally sustained inter-agency collaboration.

3.2.5. Sustainability and institutionalisation

DTWGs have been established for Boeng Sneh and Boeng Ream to manage water, agriculture, fisheries, irrigation, and natural resources in relation to specific aquatic ecosystems and associated food production and other functions. These groups were formed under the district

governance system. The Boeng Sneh DTWG was established and is chaired by the deputy governor of Ba Phnom District, with participation from three additional districts in Prey Veng. In contrast, the Boeng Ream DTWG was established and is chaired by the deputy governor of Santuk District in Prey Veng and is subsequently referred to as the Santuk DTWG.

The Boeng Sneh DTWG has initiated steps toward sustainability by integrating its functions into district planning cycles and pursuing co-funding through Commune Development Funds. Provincial endorsement via Prey Veng's PWG-FSN structure confers legitimacy. However, a dedicated operational budget has not yet been institutionalised. Similarly, the Santuk DTWG follows the Boeng Sneh DTWG in being formally established as the Santuk DWG-FSN, and it is recognised by the Kampong Thom's PWG-FSN.

The DTWGs are increasingly being integrated into Cambodia's institutional framework for implementing the National Strategies on Food Security and Nutrition (NSFSN), moving beyond project-based coordination toward formalised governance roles.

At the national and provincial level, DTWGs in Boeng Sneh (Prey Veng) and Santuk (Kampong Thom) have been formally recognised by the CARD and linked to PTWG-FSNs. This integration positions DTWGs as district-level operational platforms that translate national FSN priorities—such as nutrition-sensitive agriculture, sustainable fisheries, climate resilience, and equitable water access—into coordinated actions at the landscape and community level.

In practice, DTWGs contribute to FSN implementation by aligning water management, fisheries protection (including CFRs), and irrigation planning with food and nutrition outcomes. Evidence and lessons generated through DTWG monitoring—such as improvements in dry-season water availability, reduced resource conflicts, and strengthened accountability in irrigation financing—have been used as case examples in Cambodia's Third National Strategy for Food Security and Nutrition (2024–2028). This demonstrates a clear feedback loop from district-level practice to national policy.

Institutionally, DTWGs are being positioned as pilot DWG-FSNs, complementing commune- and provincial-level FSN mechanisms under decentralisation reforms. While full institutionalisation will require clearer mandates and budget lines, current integration shows that DTWGs are no longer ad-hoc coordination bodies but are emerging as embedded implementation mechanisms for Cambodia's FSN strategy.

Based on the strong performance of the two pilot DTWGs in Boeng Sneh (Ba Phnom District) and Santuk District, CARD took steps to formally strengthen vertical coordination for FSN. Specifically, CARD established District Working Groups on Food Security and Nutrition (DWG-FSN) in Santuk and Ba Phnom as part of the national FSN institutional framework.

Through this arrangement, the DWG-FSNs serve as the missing district-level layer linking national and provincial FSN structures with commune- and community-level implementation. The existing DTWGs were formally recognised as technical sub-groups under the DWG-FSNs, allowing them to continue leading integrated water, fisheries, and agriculture coordination while reporting into the broader FSN system. As a result, Cambodia now has a complete and coherent vertical structure for FSN governance, connecting CARD at the national level, PWG-FSNs at the provincial level, DWG-FSNs at the district level, and DTWGs working directly with communes and communities. In Boeng Sneh Lake, three DTWGs—Ba Phnom, Peam Ro, and Svay Antor Districts—have been formalised by CARD and the Provincial Government. Additionally, the Santuk DTWG has been formally established in Boeng Ream by CARD and the Provincial Government.

In implementing these newly formed DTWGs, organisations such as WorldFish, IWMI, IFReDI, and CDRI continue to collaborate with sub-WGs, which comprise members of the DWG-FSNs, local authorities, and CBOs. In Boeng Sneh Lake, the DTWG has been operationally organised into sub-DTWGs, composed of key representatives from each of the three surrounding districts—Ba Phnom, Peam Ro, and Svay Antor—to focus specifically on lake-wide issues. These sub-DTWGs bring together district officers, PDOWRAM, PDAFF, FiACs, commune administrations, FWUCs, CFR and CFi representatives whose mandates directly affect Boeng Sneh Lake. The sub-DTWGs function as issue-focused coordination units, allowing members to jointly analyse hydrological conditions, irrigation and watergate operations, fisheries protection, and conservation concerns at the lake scale, rather than through fragmented district processes. Their discussions feed into the full DTWG, where cross-district decisions are consolidated, endorsed, and communicated back to respective agencies and communes. This structure improves responsiveness, reduces duplication, and ensures coherent management of Boeng Sneh as a shared ecological system.

In Santuk District, the DTWG is expected to expand its operational focus beyond the Boeng Ream CFR to cover the wider Kakoh irrigation system, which serves ten surrounding villages. This expansion is significant because Boeng Ream CFR is hydrologically connected to the Kakoh irrigation network, yet until now, water management decisions for the CFR and for irrigation have largely been addressed through separate sectoral processes. By bringing the Kakoh irrigation system formally under the DTWG's coordination mandate, the DTWG will be able to jointly assess water availability, seasonal demand, and trade-offs across fisheries and rice farming. This includes coordinated decisions on watergate operations, irrigation scheduling, dry-season abstraction limits, and protection of minimum water levels in the CFR to sustain fish stocks and biodiversity. The expanded scope will also allow FWUCs, CFR committees, PDOWRAM, PDAFF, FiAC, and commune administrations to engage within a single, integrated decision-making platform. Overall, linking Boeng Ream CFR with the Kakoh irrigation system strengthens DTWG's role as a landscape-level water governance mechanism, enabling more balanced, transparent, and conflict-sensitive allocation of water for both food production and ecosystem sustainability.

3.3. Overall changes in Boeng Sneh and Boeng Ream

Drawing from field evidence and management documents—including DTWG Success Story Report (2024), Boeng Sneh and Boeng Ream Management Plans (2024–2029), Innovative Framework for Integrated Decentralised Food System Governance (Sok et al. 2025), and DTWG Partners—the following summarises the tangible, ground-level changes brought by the DTWG approach in both districts.

3.3.1. Changes in water allocation and accessibility between users

The DTWGs have improved coordination over the water allocation and distribution in the Boeng Sneh and Boeng Ream Lakes. DTWG meetings have focused on water allocation. DTWGs have shared information about water situations at the ground level with the district and provincial governments. During the farming seasons in 2023–2024, DTWGs coordinated with the provincial governments of both provinces to inform farmers to reduce rice farming from three crops to two crops per year. Experiences in 2023–2024 provided lessons learnt to DTWGs and farmers to prepare for rice farming in 2025. Thus, rice farming in 2025 is not expected to face water shortages, as DTWG members have engaged with communities and local governments to rehabilitate irrigation canals, watergates, and reservoirs.

At Boeng Sneh Lake, coordinated planning between PDOWRAM, FWUCs, CFis and Commune Councils improved water allocation and distribution equity. Hydrological data and participatory mapping supported the scheduling of water releases among the three connected districts—Ba Phnom, Peam Ro, and Svay Antor—resulting in 32 million cubic metres of dry-season water retention in 2024, a 28 percent increase compared to 2020–2023. Similarly, in Boeng Ream (Santuk District), rehabilitation of 4.5 km of secondary canals expanded irrigation coverage to 1,150 ha and 3,000 households, including smallholders previously located outside the command area.

Water allocation is now determined through DTWG consensus, considering irrigation, fisheries, and domestic needs. This shift from unilateral departmental decisions to multi-stakeholder scheduling ensured all water users—especially smallholder farmers and fishery-dependent households—have more predictable and fair access to water resources. If DTWGs continue to function and coordinate, they could improve information sharing and address water shortages across the Boeng Sneh and Boeng Ream ecosystems.

3.3.2. Reduction in conflicts over water

Prior to the establishment of the DTWG, conflicts between irrigation users and fishing communities were frequent, particularly during the dry season. The DTWG framework enabled the formation of joint conflict-resolution committees comprising representatives from both FWUC and CFi. In Boeng Sneh, awareness campaigns focused on ecological limits contributed to a reduction in dry-season cropping intensity. Consequently, reported water-use conflicts declined by over 60 percent in 2024 relative to the 2022 baseline. No water conflicts were documented during DTWG meetings.

In Santuk, coordinated water scheduling prevented upstream over-abstraction and ensured continuous flow into the Boeng Ream CFR. Commune-level reflection sessions revealed that disputes over water among farming groups had become infrequent, with most local conflicts resolved through dialogue facilitated by DTWG-trained mediators. Pumping from the Boeng Ream CFR has remained stable. Furthermore, CFR Committees collaborate with FWUCs in Kakoh and the Commune Administration to release water from irrigation canals into the CFRs.

3.3.3. Impacts on the lake ecosystem and sustainability

Both lakes have experienced visible ecological recovery linked to improved water management and cross-sectoral cooperation. In Boeng Sneh, FiAC Prey Veng organised the Fish Day in 2025 and released 25,000 fish fingerlings into the Boeng Sneh. DTWG members and villagers have reported the improved fisheries in Boeng Sneh Lake. They also established the revitalised conservation zones involving 150 multi-sector participants and helped restore fish populations and water quality. Vegetation regeneration around conservation areas improved sediment retention and reduced siltation. Also, enhanced water retention through canal rehabilitation stabilised wetland habitats, which are essential for fish breeding and bird nesting. Monitoring data from FiAC and PDOE indicated a modest increase in fish diversity and fewer instances of illegal fishing activities by 2025.

In the Boeng Ream CFR, illegal fishing was reduced in 2025. In addition, FiAC of Kampong Thom Province conducted the “Fish Day” in 2024 and 2025 to release around 3,000 fish fingerlings into the Boeng Ream CFR. Villagers in the meeting with the study team reported the increased fish catch from Boeng Ream Lake. Overall, ecosystem functions—such as nutrient

cycling, flood buffering, and habitat protection—have become more resilient, showing how local co-governance contributes to long-term sustainability.

3.3.4. Benefit flows to different user groups (including women)

Expanded irrigation coverage and enhanced water reliability increased yields for both wet- and dry-season rice crops in the Boeng Sneh areas and around Boeng Ream Lake. In Santuk, average household paddy output rose by 15–20 percent within one year following DTWG-led canal rehabilitation. Despite these productivity gains, the paddy rice price in 2025 remains relatively low at approximately KHR600 per kilogram, which presents challenges for farmers seeking to sell their rice.

Restored lake habitats have increased fish stocks, supporting year-round small-scale fishing and improving household food security for fishers and CFi members. Local communities recognise the importance of integrating irrigation systems with CFis and CFRs. The presence of water in canals, CFRs, CFis, and rice fields enables farmers to simultaneously access fish, rice, and water resources.

Women have achieved greater visibility and tangible benefits through participation in DTWGs and community livelihood initiatives. CCWC was formally included in DTWG discussions, ensuring that women's perspectives on domestic water use, home gardens, and small-scale aquaculture were incorporated into district planning. Women-headed households experienced improved access to water for home gardens and aquaculture, which diversified both income and nutrition sources. In Boeng Sneh, women engaged in vegetable and small fish aquaculture reported a 20–25 percent increase in supplementary household income. In addition to material gains, women's involvement in planning processes has fostered a cultural shift, leading to increased recognition of women as resource managers rather than solely as beneficiaries. Consistent access to domestic water has reduced the time required for water collection, thereby improving health and productivity.

Across Boeng Sneh and Boeng Ream, the DTWG model has generated measurable ground-level changes: fairer water distribution, reduced conflicts, ecological restoration, and inclusive livelihood gains. By combining technical coordination with participatory governance, DTWGs have created self-reinforcing cycles of trust, knowledge-sharing, and local accountability, positioning district-level co-management as a cornerstone of Cambodia's climate-resilient and gender-responsive food systems governance.

3.4. Leveraging provincial support and synergies with other development actors

3.4.1. Provincial endorsement and institutionalisation of DTWGs

The provincial government plays a pivotal coordinating role in Cambodia's decentralised governance architecture. In both Prey Veng and Kampong Thom, the PWG-FSN—chaired by the deputy governor and coordinated nationally by CARD—serves as a formal linkage between DTWGs and national TWG-FSNs. Through this mechanism, the DTWGs have become recognised as district-level coordination bodies under Cambodia's broader Sub-Decree No. 184 (2019) on integrated administrative structures (RGC 2019) and therefore, transformed it into DTWG-FSN. Provincial departments—including PDOWRAM, PDAFF, and PDOE—now view DTWG-FSNs as essential vehicles for implementing the *National Strategy for Food Security and Nutrition (NSFSN) 2024–2028* (RGC 2025, 2024), and the *Pentagonal Strategy, Phase I (2023–2028)* (RGC 2023).

This provincial endorsement is reflected in several concrete outcomes. The Provincial Working Group on FSN in Prey Veng formalised the Boeng Sneh DTWG as the District Working Group of FSN and approved the renaming of the Ba Phnom DTWG to the District Working Group on FSN (DWG-FSN) of Ba Phnom, thereby establishing a direct link to the provincial Working Group on FSN. Additionally, two other districts have formalised their DTWGs as the DWG-FSNs of Peam Ro and Svay Antor, respectively. In Santuk District, the Santuk DTWG has been formalised into the DWG-FSN of Santuk. However, given the nature of the DTWGs under the specific district administrative systems, for Boeng Sneh Lake and the Boeng Ream Lake, a sub-District Technical Working Group is needed. As such, the Boeng Sneh and Boeng Ream DTWGs remain as the sub-DTWG-FSNs. Thus, the sub-DTWG reports, and management plans are now routinely shared with the Provincial Working Group on FSN, PDOWRAM, PDAFF, FiAC, and commune and district governments. These entities utilise the inputs to inform provincial investment and irrigation planning. In Santuk, PDOWRAM responded to DWG-FSN proposals by financing a 4.5 km canal rehabilitation, securing irrigation for over 3,000 households through joint advocacy and technical justification.

This illustrates that provincial-level coordination and budget responsiveness are critical for integrating DTWG-led initiatives into formal national administrative systems. The DWG-FSNs have benefited from a strong network of technical partnerships that combine scientific evidence, policy advocacy, and field-based capacity building. Key contributors include WorldFish, IWMI, IFReDI, and CDRI, which operated under the *Asian Mega-Deltas (AMD)* and *Resilient Aquatic Food Systems (RAqFS)* programmes (2022–2024) and now advancing under Scaling for Impact and Sustainable Animal and Aquatic Food programmes. These institutions provide funding for selected DTWG–FSN operational activities and associated technical support, helping to sustain routine coordination and implementation at the district level. They also contribute scientific and hydrological analyses—including climate change projections, water storage assessments, and water-use mapping—which inform decision-making on how to balance water allocation for seasonal irrigation, fisheries conservation, and lake restoration. In addition, the institutions support capacity development and facilitation training for DTWG members, focusing on participatory planning methods, meeting documentation, and consensus-based problem-solving. Their engagement further enables evidence-based advocacy, allowing DTWG-FSNs to mobilise resources for ecosystem management interventions such as fish refuge rehabilitation and biodiversity conservation measures. Partnerships also extend to other development actors, strengthening transboundary ecosystem governance, as well as to the CARD, which integrates DTWG-generated evidence into the third national Food Security and Nutrition strategy. This alignment between research partners and provincial administrations helps ensure that DTWG-FSNs are embedded within existing administrative systems, enabling them to function sustainably beyond donor-dependent project cycles.

3.4.2. Financial mechanisms and co-financing models

An encouraging feature of the DTWGs has been their ability to mobilise financial resources from multiple sources, including government, community, and donor contributions, to sustain local actions. In Santuk, the canal rehabilitation and water-gate improvements in Kakoh irrigation system over 4.5km were financed by provincial budget allocations following DTWG advocacy and evidence submission to PDOWRAM and PDAFF. In Boeng Sneh, the DTWG negotiated with PDOWRAM for funds to repair lake spill-over dikes and strengthen fish sanctuary protection, as documented in the Boeng Sneh Management Plan (2025–2029).

DTWGs in both provinces have embedded selected activities—such as community patrols, forest planting, and monitoring—into Commune Investment Plans (CIPs) and Commune Development Funds (CDFs). This local budget integration ensures continuity beyond donor cycles and empowers commune administrations as co-financiers in ecosystem governance.

External partners—such as the European Union (EU), Asian Development Bank (ADB), and World Bank—are identified as potential financiers for scaling integrated governance frameworks, coordinated through CARD and provincial governments. The Policy Brief (2024) recommends establishing a dedicated fund from the national budget to finance decentralised food system governance at district level, coupled with donor co-financing for sustainability.

The DTWGs have also begun exploring public–private partnerships (PPPs) for infrastructure maintenance. Evidence from DTWG meetings and stakeholder interviews indicates that rice millers and irrigation cooperatives have formally expressed willingness in principle to co-finance canal cleaning and pumping station maintenance, particularly where water reliability directly affects milling throughput and paddy supply. These discussions have been facilitated through the DTWG, which provided a neutral platform for FWUCs, private actors, and government agencies to clarify roles, costs, and expected benefits. However, no large-scale financial transfers or contractual agreements have yet been finalised or implemented, mainly due to the need for clearer cost-sharing arrangements, legal modalities, and assurance of water-use stability. This emerging interest is nonetheless significant. It signals a shift from donor- or state-dependent infrastructure maintenance toward locally driven, value-chain-based investment logic. With further piloting in 2025, this could indeed become a flagship story for 2026, suitable for documentation through policy briefs and media coverage. Showcasing such cases—especially via newspapers—could encourage similar partnerships between value-chain actors and FWUCs, even in districts where DTWGs are not yet established, by demonstrating tangible business incentives for collective water governance.

3.4.3. Knowledge, reporting synergies, and future priorities

Formal and informal reporting lines currently link DTWGs to provincial institutions. Quarterly reports submitted to PDOWRAM, PDAFF, and PDOE provide updates on water levels, fishery enforcement, and community livelihoods. These reports enable provincial agencies to incorporate district-level data into agricultural and hydrological forecasts, thereby reinforcing the feedback loop between field operations and regional planning. Identify investment priorities for canal and reservoir rehabilitation; allocate technical staff and budgetary support; and inform annual planning submissions to the Ministry of Economy and Finance.

This reporting structure institutionalises DTWGs within Cambodia's multi-level governance system, ensuring provincial visibility and alignment with policy objectives. The Boeng Sneh and Santuk DTWGs illustrate that leveraging provincial and multi-actor synergies extends well beyond routine administrative coordination and can be genuinely transformative. Through these collaborations, grassroots ecological realities—such as seasonal water dynamics, fisheries pressures, and livelihood needs—are effectively connected to provincial policy processes and budgetary mechanisms. These DTWGs also mobilise financial and technical resources across multiple sectors, enabling more integrated responses that combine water management, agriculture, fisheries, and environmental conservation. At the same time, the collaborative platforms foster trust and shared accountability among government agencies, community institutions, and private sector actors, helping to align incentives and responsibilities. Together, these dynamics establish a strong foundation for replicable and climate-resilient natural

resource governance models that can be adapted and scaled across Cambodia's floodplain districts, particularly in contexts facing increasing hydrological variability and climate risk.

Even though sectoral reports (e.g., from PDOWRAM, PDAFF, FiAC) would have been produced regardless of DTWGs, the evidence shows that their *content, framing, and use* are now clearly influenced by officials' participation in DTWGs. The change is not in the existence of reports, but in how they are informed, coordinated, and acted upon. First, reports are increasingly shaped by shared evidence and cross-sector perspectives. DTWG members now draw on joint hydrological assessments, community feedback, and field observations from FWUCs and CFR committees, rather than relying solely on sector-specific data. For example, PDOWRAM reporting on water availability in Boeng Sneh increasingly references fisheries needs and dry-season ecological thresholds, reflecting learning gained through DTWG discussions. Second, reporting has become more problem-oriented and solution-focused. Before DTWGs, sectoral reports tended to document activities or infrastructure status within ministerial mandates. As DTWG members, officials now frame reports around shared problems (e.g., irrigation–fisheries conflicts, illegal fishing, spill-over dike performance) and coordinated responses, aligning recommendations with what other agencies can realistically implement. Third, reports are more likely to trigger follow-up action. Because DTWG members sit together, reports are no longer "end products" but inputs into collective decision-making. Findings are discussed in DTWG meetings, disseminated through Telegram groups and commune offices, and used to justify adjustments in watergate operations, patrol coordination, or budget requests—something rarely observed prior to DTWGs. Overall, sectoral reports still exist independently of DTWGs, but DTWG participation has reoriented them from siloed accountability documents toward shared governance tools, increasing their relevance, coherence, and practical impact.

3.4.4. Gender and community inclusion

Gender equity and social inclusion have become central to the operationalisation of DTWGs in Boeng Sneh (Prey Veng) and Santuk (Kampong Thom). Initially, DTWG formation was primarily technocratic, focusing on water, fisheries, and agricultural coordination. Over time, the process has increasingly incorporated the perspectives and priorities of women and marginalised community members, leading to significant changes in district-level decision-making practices.

In both Boeng Sneh and Santuk, DTWGs now explicitly recognise that women experience water use and ecosystem changes differently from men due to their diverse livelihood and caregiving responsibilities. Women serve as household water users and as small-scale food producers, managing home gardens, fish ponds, and backyard livestock. These activities are critical for nutrition, income diversification, and household resilience to climate shocks. Seasonal water shortages, fluctuating fish availability, and declining soil fertility directly affect women's productive and reproductive roles. For example, in Santuk, women involved in small-scale shrimp aquaculture reported that sudden water releases from irrigation structures caused losses in their fish ponds.

To institutionalise gender inclusion, DTWGs have invited women representatives from Commune Councils to participate actively in planning and decision-making processes. Women representatives from the Commune Councils attend DTWG quarterly meetings alongside line department officers and community organisations, including FWUCs, CFis, and ACs. The participation of women representatives from the Commune has enhanced the inclusivity and social responsiveness of DTWG deliberations. For example, in Boeng Sneh, the women representatives successfully advocated for the integration of a household rainwater harvesting

pilot into the district's water management plan, benefiting over 250 households across two communes.

Gender-responsive planning is now integrated into DTWG operational routines. Meeting agendas consistently include gender and social inclusion as regular discussion points, and monitoring templates track participation disaggregated by sex and role. Consequently, both Boeng Sneh and Santuk DTWGs have increased female participation rates in official meetings, rising from less than 10 percent at formation to approximately 25–30 percent by late 2025.

In addition to promoting gender parity, DTWGs have worked to strengthen the inclusion of vulnerable and resource-dependent communities. Members from CFis, CFRs, FWUCs, and ACs are systematically represented in DTWG sessions. This diversity ensures that decisions regarding water allocation, fish sanctuary zoning, and agricultural intensification incorporate multiple local perspectives. In Santuk, the DTWG facilitated dialogue between irrigators and fishery community members to establish joint water-release schedules, thereby reducing dry-season conflicts. In Boeng Sneh, smallholder farmers and CFi leaders co-developed a community monitoring framework to track illegal water pumping and wetland encroachment. These participatory mechanisms have improved social accountability and reinforced the legitimacy of DTWG decisions at the community level.

Despite these advancements, several constraints persist within DTWG processes. Gender roles and prevailing social norms continue to restrict women's participation in technical meetings, particularly during peak agricultural seasons when time and labour demands are highest. Data gaps also remain a significant challenge, as gender-disaggregated information on water access, labour burdens, and the distribution of benefits from agricultural programmes is collected inconsistently. In addition, the limited representation of youth and indigenous groups within DTWG structures constrains broader inclusiveness and weakens the responsiveness of governance processes to diverse perspectives. Future DTWG capacity-building efforts should therefore prioritise a set of targeted actions. These include appointing dedicated gender focal persons within each DTWG, supported by technical mentoring from provincial gender departments, to strengthen institutional attention to gender equality. Targeted livelihood programmes, such as aquaponics and integrated homestead farming, should be implemented to enhance women's adaptive capacity and economic resilience. Further priorities include integrating gender-sensitive budgeting into commune and district investment plans,and conducting regular participatory reviews to assess whether DTWG decisions are effectively reducing gender disparities in access to water and livelihoods.

By deliberately including women and community voices, DTWGs have initiated a gradual transformation in governance culture in both provinces. Decision-making is no longer dominated exclusively by technical departments; instead, it increasingly incorporates everyday livelihood concerns articulated by women and local producers, broadening the scope of what is considered legitimate policy input. As a result, lake management and irrigation planning now place greater emphasis on balancing productivity objectives with domestic and nutritional water security, reflecting a more holistic understanding of water use. In this process, women's councils have emerged as important intermediaries, linking household-level experiences with district-level planning and helping to close long-standing governance gaps between the home and formal institutions.

4. Persistent challenges and sustainability

Despite the strong achievements in improving water governance and ecosystem restoration in Boeng Sneh (Prey Veng) and Boeng Ream (Santuk, Kampong Thom), several challenges remain that could constrain the long-term sustainability of the DTWG model. These challenges cut across financial, institutional, and behavioural dimensions, and each is linked to specific governance elements that must be strengthened to ensure DTWGs remain effective and resilient.

4.1. Bridging gaps in institutional coordination and addressing overlapping mandates in Boeng Sneh and Boeng Ream

The challenge of managing water, agriculture, fisheries, irrigation, and natural resources in Boeng Sneh (Prey Veng) and Boeng Ream (Santuk, Kampong Thom) exemplifies Cambodia's persistent institutional fragmentation and sectoral governance. Although decentralisation reforms are ongoing, ministries and agencies continue to operate under disconnected mandates, resulting in overlapping responsibilities, inefficiencies, and policy incoherence. The delegation of management authority to the district level for water, land, and natural resources is not accompanied by adequate capacity, financial resources, or decision-making power, thereby constraining DTWGs in fulfilling their roles and responsibilities.

At Boeng Sneh, at least six line ministries and agencies share jurisdiction over the same ecological system—MOWRAM, MAFF, MOE, MRD, MLMUPC, and MISTI—each pursuing distinct sectoral objectives.

MOWRAM manages irrigation systems and delegates local oversight to the PDOWRAM and Farmer Water User Communities (FWUCs). While FWUCs generally fulfil their assigned responsibilities, their mandate remains narrowly focused on water and irrigation infrastructure, with limited engagement in fisheries, land management, or biodiversity conservation. MAFF, through the Fisheries Administration (FiA), oversees agriculture and fisheries, promotes rice intensification, and establishes Community Fisheries (CFis) and Community Fish Refuges (CFRs); however, recurrent water shortages frequently generate conflicts between farmers and fishers.

MOE is responsible for biodiversity conservation and the protection of flooded forests, including the management of the Toulporn Taley Boeng Sneh Bird Sanctuary, while the Ministry of Tourism promotes ecotourism development. Despite these overlapping interests, biodiversity management remains weakly connected with PDOWRAM, the PDAFF, and the FiAC in terms of planning alignment, technical integration, and operational cooperation. MRD and MISTI each manage aspects of rural and urban water supply, further fragmenting authority; MISTI, in particular, remains oriented toward technical and central-level functions and has limited implementation activities at the local level.

MLMUPC holds responsibility for Commune Land Use Planning and supports inventories of wetlands, water bodies, and community areas. In this context, the formal demarcation of Boeng Sneh Lake and Boeng Ream Lake would significantly improve the management and conservation of these ecologically important areas.

Similarly, in Boeng Ream, the TKIS involves PDOWRAM, FWUCs, and FiAC. However, coordination between irrigation management and fish conservation in the Boeng Ream CFR remains limited. Ministries have historically been established with distinct mandates and financing structures, leading to competing interventions, such as simultaneous canal dredging for agriculture and fish habitat protection under separate projects.

While these features of fragmentation were characteristic of natural resource management prior to the establishment of DTWGs, the evidence shows that DTWGs have begun to reduce—but not fully eliminate—these problems:

- Parallel planning: Sectoral plans are still produced by individual ministries, but in DTWG areas, they are now increasingly discussed, adjusted, and sequenced through DTWG meetings. In Boeng Sneh and Santuk, irrigation schedules, fisheries protection measures, and lake management actions are no longer developed in isolation; however, formal planning documents remain sector-owned, and integration is stronger in practice than on paper.
- Overlapping jurisdiction: Spatial overlaps between CFRs, CFis, and FWUC-managed irrigation zones still exist, but DTWGs have created a coordination space where these overlaps are explicitly recognised and negotiated. Conflicts are now more likely to be addressed jointly (e.g., through coordinated watergate operations or patrols), even though legal mandates remain unchanged.
- Weak vertical integration: District and commune authorities still lack formal authority over provincial departments, yet DTWGs have strengthened their convening and mediating role. Through DTWGs—and more recently DWG-FSNs—districts can now channel local issues upward and coordinate provincial responses, though decision-making power continues to sit largely at provincial and national levels.
- Inefficient use of funds: Fragmented financing has not disappeared, but DTWGs have improved transparency, sequencing, and co-financing in shared landscapes. Examples include coordinated canal rehabilitation, aligned use of Commune Development Funds, and emerging public–private financing discussions. Full budget integration, however, remains constrained by sectoral funding rules.

In summary, DTWGs have not replaced sectoral mandates or eliminated fragmentation, but they have measurably reduced its negative effects by improving coordination, communication, and collective problem-solving at the landscape level. The remaining gaps reflect structural and legal constraints, not a lack of DTWG effectiveness, making these gaps a logical focus for the recommendations section.

4.1.1. Stakeholder representation

DTWGs in both Boeng Sneh and Boeng Ream have begun to address institutional fragmentation by broadening representation to include the PDOWRAM, PDAFF, PDOE, FiACs, Commune Councils, FWUCs, and CFis. With the establishment of the DWG-FSN under CARD, many of the sectoral actors previously identified as missing—PDMRD, PDLMUPC, MISTI, and CCWC—are now formally represented at the district level. The DWG-FSN provides the institutional umbrella for inclusive, multi-sectoral representation, addressing gaps in water supply, domestic water use, infrastructure, land-use planning, and innovation that extend beyond water and fisheries alone. Within this structure, DTWGs should be understood as technical and ecosystem-focused sub-groups, operating under the DWG-FSN. DTWGs concentrate on specific ecological systems and shared landscapes (e.g., Boeng Sneh Lake across multiple districts, or Boeng Ream CFR linked to irrigation systems), where intensive coordination is required among water, fisheries, agriculture, and environment actors. They do not replace the DWG-FSN's broader sectoral mandate but feed technical analysis, evidence, and coordination outcomes upward into it. Accordingly, the challenge is no longer the *absence* of key sectors at the district level but rather ensuring effective linkage between DWG-FSN's inclusive policy

coordination role and DTWG's ecosystem-level operational coordination. This clarification should be stated upfront in the report and applied consistently thereafter, framing DTWGs as landscape governance mechanisms embedded within a now-complete national-to-community FSN institutional architecture.

Institutionalised participation of women representatives of the Commune Councils is also essential to ensure that domestic and livelihood water needs are addressed alongside agricultural priorities.

4.1.2. Information sharing and consensus-building

Currently, hydrological, fisheries, and irrigation data are increasingly shared through DTWG discussions, particularly during joint problem analysis, seasonal planning, and the preparation of lake or ecosystem management plans. PDOWRAM, PDAFF, FiACs, FWUCs, and CFR committees routinely exchange information on water levels, irrigation operations, fish stocks, and emerging risks during DTWG meetings and through informal channels such as Telegram groups. This represents a clear improvement compared to pre-DTWG practices, where such information was rarely discussed across sectors.

However, data sharing remains largely discussion-based and episodic, rather than fully institutionalised. Information is exchanged to inform decisions, but it is not yet consistently consolidated into joint monitoring frameworks, shared datasets, or co-authored reports that can be systematically tracked over time or used across planning cycles. As a result, accountability and learning still depend heavily on individual initiative and facilitation rather than standardised procedures.

To deepen integration, DTWGs would benefit from formalising joint planning and reporting sessions, supported by simple common tools (e.g., shared water-level logs, participatory maps, agreed indicators). This would build on existing practices—rather than replace them—by transforming regular information exchange into durable, shared evidence systems that strengthen mutual understanding, transparency, and long-term coordination.

4.1.3. Sustainability

The DTWG model demonstrates that effective coordination can originate at the local level. In both provinces, DTWGs function as bridging platforms between DANRE, Commune Councils and provincial departments, facilitating dialogue that aligns ecological, agricultural, and social objectives.

However, five conditions are essential to ensure long-term sustainability:

1. Clear delineation of mandates across ministries through formal Memoranda of Understanding (MoUs), coordinated by the CARD and PWG-FSNs.

2. Under the NCDD, district administrations are the legally mandated bodies responsible for sub-national coordination, planning, and service delivery. The DTWG-FSN is therefore anchored within the district administration system overseen by NCDD, even though its technical leadership and policy alignment come from CARD.

3. The DWG-FSN is chaired by the district governor and operates within district administrative structures that fall under NCDD authority. This ensures alignment with Commune/Sangkat Development Plans (CDPs), Commune Investment Programmes (CIPs), and district development planning processes.

4. While CARD provides the FSN policy mandate and vertical linkage (national → provincial → district), NCDD provides the administrative legitimacy and implementation machinery at sub-national levels. DWG-FSNs translate FSN priorities into actions that can be integrated into NCDD-led planning and budgeting cycles.

5. Through NCDD systems, DWG-FSNs can engage Commune Councils, CCWC, and community institutions, ensuring that food security, nutrition, water, and livelihoods priorities are reflected in local plans and investments.

In short, CARD defines the "what" (FSN policy and coordination), while NCDD enables the "how" (sub-national governance, planning, and implementation). The DWG-FSN sits at the intersection of these two systems, bridging national FSN strategy with decentralised execution on the ground. In summary, fragmented institutional coordination in Boeng Sneh and Boeng Ream reflects wider structural weaknesses within Cambodia's multi-sector governance. However, by enhancing stakeholder inclusiveness and shared decision-making within DTWGs, these districts are pioneering a replicable model of integrated, decentralised governance. This model is capable of reconciling competing mandates while ensuring water, food, and ecosystem sustainability at the landscape scale.

4.2. Financial constraints and unstable resource mobilisation

Although the DTWGs have demonstrated effectiveness in coordinating irrigation, water, fisheries, and ecological management, both Boeng Sneh (Prey Veng) and Boeng Ream (Santuk, Kampong Thom) continue to experience financial instability and lack sustainable, predictable funding sources. In Boeng Sneh, short-term donor and project-based grants, such as those from the AMD and RAqFS initiatives, which are advancing under Scaling for Impact (S4I) and Sustainable Animal and Aquatic Foods (SAAF) programme, have supported targeted interventions including community awareness campaigns, capacity building, fish conservation, vegetable cultivation, and the rehabilitation of small sluices and irrigation canals. However, these funds are limited in quantity and duration and do not fully address ongoing operational costs such as meeting facilitation, field monitoring, or data management. When external projects conclude, DTWG activities often slow because district administrations lack dedicated budget lines and financial autonomy to sustain coordination functions. To address this, DTWGs need diversified and complementary financing mechanisms, including: (i) government funding through earmarked allocations within district budgets and Commune Development Funds for coordination and monitoring; (ii) donor and NGO co-financing to support learning, data systems, and scaling during transition periods; and (iii) private-sector contributions, such as cost-sharing with value-chain actors (e.g., millers, irrigation service providers) who benefit from improved water reliability. Combining these sources would reduce dependency on single projects and enable more resilient, locally anchored DTWG operations.

In Boeng Ream, government and community funding enabled the rehabilitation of 4.5 kilometres of secondary canals in Kakoh Commune, thereby improving irrigation access for nearly 3,000 households. However, there is no consistent operational budget allocated for maintenance, monitoring, or management follow-up. Most DTWG activities, including cross-commune coordination meetings and capacity-building for FWUCs and the CFR committee, rely on ad hoc financial contributions from DANRE or development partners such as WorldFish and IWMI.

FWUCs collect water fees of KHR400,000 per hectare of rice field, serving as a primary local financial mechanism. However, FWUCs encounter difficulties in collecting irrigation fees

regularly due to variable farmer incomes, inadequate enforcement mechanisms, and limited water supply. Despite these challenges, DTWG-facilitated awareness campaigns and joint monitoring led to a 27 percent improvement in irrigation fee collection at Boeng Ream in 2025. This outcome suggests that enhanced local cooperation, supported by transparent oversight, can improve fiscal discipline.

The PDOWRAMs receive annual funding from MOWRAM for the operation and maintenance of provincial irrigation systems. This budget is intended for repairing damaged irrigation canals throughout the province. FWUCs are required to develop proposals to secure financial support for irrigation canals in their respective regions, resulting in competition among FWUCs for these limited funds. FWUCs in Boeng Sneh and Boeng Ream frequently fail to secure these budgets. Additionally, Commune Authorities manage Commune Development Funds, which are primarily allocated to road construction and other non-water infrastructure rather than irrigation development.

These financial constraints undermine the DTWGs' ability to maintain regular data collection, ecosystem monitoring, and participatory training programmes, which are essential for long-term water and ecosystem governance. Without institutionalised resource mobilisation, the DTWGs risk reverting to dependency on donor cycles, limiting their resilience and continuity.

Governance elements to strengthen:

1. Transparency and Accountability

- Strengthening financial governance is essential for building public trust and ensuring continuity of operations.
- Currently, the district administrations in Boeng Sneh and Snatuk lack established financial systems. It is necessary to develop standardised financial reporting templates for DTWG activities that specify expenditures for training, monitoring, and infrastructure maintenance.
- Regular public disclosure of budgets and expenditures, such as through commune notice boards or DTWG quarterly reports, can demonstrate responsible fund management and promote community co-financing.
- Establishing a joint auditing mechanism involving the District Administration, Commune Councils, PDAFFs, FiACs, and PDOWRAMs could institutionalise accountability, prevent misuse, and ensure equitable allocation of funds.

2. Leveraging Provincial Synergies and Development Partnerships

- Sustainable resource mobilisation depends on integrating DTWG planning with broader provincial and national financing mechanisms.
- Aligning DTWG priorities and the management plans of Boeng Sneh and Boeng Ream with District Investment Plans, Provincial Department Work Plans, and Commune Development Plans (CDPs) would enable access to recurrent public funds for local water management, irrigation, climate adaptation, agriculture, fisheries, and food security.
- Partnerships with development actors, including the EU, ADB, and World Bank, can facilitate co-financing models in which external funding supplements district and community resources, especially where DTWGs align with the goals of large donor programmes.

- CARD and the PWG-FSN can play a catalytic role by integrating DTWG functions into Cambodia's decentralised budgeting system, thereby ensuring regular state allocations for operational and monitoring costs.

3. Sustainability

- DTWGs have been integrated in the CARD structure, in which a new layer of district level governance was created by CARD to extend the national-provincial structure, which then also linked the DTWGs - this would also be in line with CARD's view that the DTWGs should be sub-groups under a DWG-FSN, and our view that these sub-groups should focus on specific ecosystems within/across districts. Once incorporated into this national structure, DTWGs can access state operational budgets through provincial and district allocations linked to Cambodia's *National Strategy for Food Security and Nutrition (NSFSN 2024–2028)* and the *Pentagonal Strategy (2023–2028)*. Sustaining these financial mechanisms requires balancing public subsidies with community affordability. Irrigation fees and local contributions must remain reasonable to ensure farmer participation. District authorities and partners should establish dedicated fiscal channels, such as CDFs or Environmental Service Payments, to ensure ongoing operational capacity.
- Over the long term, transparency and fiscal integration will determine whether DTWGs transition from project-based coordination units to self-financing, district-embedded governance platforms. Institutionalising multi-source financing, clear reporting, and provincial linkages will enable the DTWGs at Boeng Sneh and Boeng Ream to serve as enduring mechanisms for integrated water, food, and ecosystem governance throughout Cambodia's floodplains.

4.3. Limited technical capacity and knowledge retention

Although the DTWGs in Boeng Sneh (Prey Veng) and Boeng Ream (Santuk, Kampong Thom) have significantly improved cross-sector collaboration, they continue to face a shortage of technical skills and institutional memory at the district and commune levels. This challenge constrains the DTWGs' ability to fully operationalise integrated water, land, and fishery management in a technically sound and adaptive manner. At both sites, district administrations, commune authorities, and community organisations (FWUCs, CFis, CFRs, ACs) lack consistent training in key technical areas, including hydrological monitoring, climate adaptation planning, participatory mapping, and financial management. As a result, DTWG activities often rely on external facilitation from partners such as WorldFish, IWMI, and IFReDI rather than being led independently by district technical staff (Table 6).

At Boeng Sneh Lake, hydrological data are collected inconsistently and irregularly, and thus, are not available throughout. Few district or commune officials possess the skills to interpret water-level fluctuations, sedimentation patterns, or ecological indicators. Fish catch data and rice yields are not available. This weakens evidence-based planning for irrigation schedules or fish sanctuary management. Similarly, at Boeng Ream, while the DTWG successfully facilitated canal rehabilitation and lake restoration, technical challenges persist in maintaining updated records of water distribution, CFR depth, and biodiversity changes in the Boeng Ream. In 2024, for instance, the replacement of the commune chiefs of Kakoh in Santuk District disrupted ongoing monitoring activities for several months, until refresher sessions were organised with support from provincial departments. Newly appointed DTWG members often lack historical context or familiarity with past decisions and data. This discontinuity slows coordination and forces repeated cycles of orientation and re-learning.

Overall, the limited technical capacity and weak knowledge-retention mechanisms threaten the DTWGs' long-term functionality, as they depend heavily on external expertise for facilitation, data management, and adaptive planning.

By transforming capacity-building from isolated training events into an ongoing governance practice, the DTWGs in Boeng Sneh and Boeng Ream can evolve into learning institutions—equipped to manage complex ecological systems, adapt to climate risks, and sustain participatory governance without constant external facilitation.

Members of DTWGs have received capacity-building in facilitation skills, problem identification and analysis, visioning exercises, stakeholder analysis, and planning for national resource management and water and agriculture management. Also, members of DTWGs from Prey Veng and Kampong Thom visited the CFi and CFR in Siem Reap to see how communities are organised to manage land, water and natural resources. These provide lessons to members to see how they work together to manage Boeng Sneh and Boeng Ream for the sustainable uses and sustain livelihoods of local communities (Table 6).

Table 6: The capacity building of the DTWG members in Prey Veng and Kampong Thom Provinces

No	Capacity building topics	Date	# Participants		Participants	Locations	Organiser
			Total	Female			
1	Conducted awareness raising on fisheries law to fishers surrounding Boeng Sneh lake	Between August and October	140	14	Local authorities, fishers and villagers	(1) Kampong Slaeng village, Theay commune, Ba Phnom district, (2) Prey Angkoun village, Prey Kadieng commune, Peam Ro district, and (3) Cheuteal village, Samrong commune, Svay Antor district, Prey Veng	Ba Phnom District Administration (Partner), Fisheries Administration Cantonment (FiAC)
3	Conducted awareness raising on the importance of the wetland protected areas surrounding Boeng Sneh lake (Tob Sdech village)	07/09/2024	58	16	Local authorities, fishers and villagers	Top Sdech village, Theay commune, Ba Phnom district, Prey Veng	Ba Phnom District Administration (Partner), Provincial Department of Environment
4	Provided training on the process of preparing the management plan to the Technical Working Group (TWG)	07/13/2024	29	4	TWG' members	Ta Sou village, Theay commune, Ba Phnom district, Prey Veng	Inland Fisheries Research and Development Institute of Fisheries Administration (partner).
5	Organised the exposure visit for the Technical Working Group (TWG) from Prey Veng and Kampong Thom	09/24/2024	30	4	TWG' members	Seam Reap province	WorldFish
6	Organised the Fish Day event in Boeng Ream Community Fish Refuge (CFR)	26/07/2024	125	48		Santuk district, Kampong Thom	Santuk District Administration (partner)
7	Provided training on the process of preparing the management plan to the Technical Working Group (TWG)	04/09/2024	21	2	TWG' members	Santuk district, Kampong Thom	Inland Fisheries Research and Development Institute of Fisheries Administration (partner)
Total			**403**	**88**			

Source: Compiled by authors

4.4. Social inclusion and representation gaps

During the earlier phase of the DTWG pilots, grassroots actors—CFis, FWUCs, ACs, Commune Councils, and CCWC—were active participants in decision-making. They contributed local knowledge, mobilised collective action and helped ensure that lake management and irrigation decisions reflected diverse livelihood realities. These actors were central to the success of participatory planning and the co-creation of management plans for both Boeng Sneh and Boeng Ream. As DTWGs are formalised as sub-groups under a DWG-FSN, then the significant governance risk can be mitigated, assuming the sub-groups can inform DWG-FSN decisions and plans.

However, as the DTWG governance framework expands into the DWG-FSN structure, CBOs and local user groups risk being under-represented. The new DWG-FSN composition, while formally linked to provincial and national planning frameworks, tends to prioritise administrative representation (district departments, line ministries, and development agencies) over community-based membership. This transition could weaken grassroots ownership and reduce sensitivity to localised livelihood issues—such as equitable water allocation, gender roles in fisheries, or smallholder access to inputs and markets.

Gender framework analysis indicates that the earlier DTWG pilot actively engaged women, youth, elders, minority groups, and non-literate users in planning and monitoring, resulting in a socially equitable and contextually grounded governance model. In contrast, the emerging DWG-FSNs, if not carefully designed, may inadvertently centralise authority and forfeit these participatory gains. For instance, at Boeng Ream, women's voices, previously represented through CWCs and CFi committees, are now less prominent in DWG-FSN meetings. Commune-level concerns regarding irrigation conflicts and fish refuge protection are increasingly filtered through district offices rather than being directly discussed by affected communities. Without deliberate mechanisms to preserve inclusivity, the DWG-FSNs risk replicating the top-down structures that DTWGs were established to reform.

To maintain the participatory spirit of the District Working Group on Food Security and Nutrition (DWG-FSN) model, community voices should continue to be included in meaningful and sustained ways. This requires maintaining clear and designated places for community groups—such as Community Fisheries (CFis), Farmer Water User Communities (FWUCs), Agricultural Cooperatives (ACs), CCWC, and Commune Chiefs—within DWG-FSN sub-committees, ensuring that district plans are grounded in real livelihood needs, including water access, gender concerns, and climate risks. It is also important to establish simple rules and rotation arrangements so that community representatives are not excluded when administrative structures or personnel change. In addition, DWG-FSNs should actively encourage women and youth from community organisations to take visible and influential roles, such as co-leading thematic areas on water, nutrition, or climate adaptation, thereby strengthening inclusiveness, leadership development, and intergenerational engagement within district-level governance.

Strong links between villages and district platforms are also essential for effective and inclusive governance. Two-way communication should be strengthened so that DWG-FSNs consistently share decisions and plans with communities, while communities are able to regularly feed local concerns, observations, and emerging issues back to the district level. Simple participatory tools, such as community mapping and problem-ranking exercises, should be used to better understand changing local priorities and livelihood challenges over time. In addition, community-based monitoring should be supported through accessible tools such as Telegram groups or simple digital reporting forms, enabling information to be shared quickly and transparently. Regular

joint reflection meetings between district officers, commune leaders, and community groups can further reinforce trust, mutual learning, and sustained collaboration.

Embedding community voices within DWG-FSNs is key to protecting the inclusive and gender-responsive approach developed under the DTWGs. With their role in district budgeting, DWG-FSNs have a real opportunity to support inclusion—especially if small resources are set aside to help community members, including poorer or remote groups, participate meaningfully.

Finally, continued partnerships with organisations such as WorldFish, IWMI, CDRI, IFReDI, CARD, and other development partners can provide technical advice and facilitation support, helping local voices remain active in district-level decision-making.

In the long term, the sustainability of integrated food and water governance depends on preserving the social contract between district authorities and communities. By institutionalising inclusive representation, transparent communication, and gender-sensitive participation, DWG-FSNs can evolve into governance platforms that are technically and administratively robust, as well as socially grounded, equitable, and locally legitimate.

The sustainability of DTWGs in Boeng Sneh and Boeng Ream depends on strengthening governance linkages, ensuring financial autonomy, and preserving connectivity as they evolve into DWG-FSNs. Addressing these challenges through systematic institutional learning, transparent financing, and continuous representation of grassroots stakeholders will ensure that the integrated water and ecosystem governance model becomes a permanent and replicable mechanism for climate-resilient local governance in Cambodia.Bottom of Form

5. Lessons for scaling the DTWG model from Boeng Sneh and Boeng Ream

Piloting the DTWGs in Boeng Sneh and Boeng Ream offers valuable insights for replication and institutionalisation in other districts within Cambodia's floodplain, Tonle Sap, and delta regions. These cases illustrate that district-level multi-stakeholder coordination mechanisms can address the persistent gap between community-based resource management and higher-level policy frameworks, provided they are effectively designed, adequately financed, and fully integrated into government systems.

The following lessons present key takeaways from achievements, challenges, and governance analysis that should guide the scaling of the DTWG model.

Integration works best when grounded in existing local structures—The success of the DTWGs can be attributed to their alignment with existing administrative and community institutions, rather than the creation of parallel systems. In both Boeng Sneh and Boeng Ream, DTWGs were integrated into the District Administrations under the leadership of district governors, thereby ensuring political legitimacy and administrative continuity. By building upon established community mechanisms such as FWUCs, CFis, ACs, and Commune Councils, decision-making processes were able to reflect actual livelihood priorities and agro-ecological conditions. This embedded approach promoted government ownership and accountability, while also facilitating cross-sector coordination among PDOWRAM, PDAFF, PDOE, and Commune Councils.

Future replication efforts should prioritise building upon existing decentralised structures, such as DANRE, DWG-FSN, and Commune or Sangkat Councils. This approach avoids duplication and ensures district-level leadership from the outset. Rather than duplication, what is needed are coordination mechanisms and significant capacity building of existing entities.

Inclusivity and representation are central to effective local governance—The DTWGs have demonstrated that inclusive participation by grassroots actors is essential for legitimacy, trust, and effective decision-making. In Boeng Sneh, the involvement of CCWC and local farmer and fishery representatives ensured that water allocation decisions made as a collective in the DTWGs, addressed both agricultural and household needs, and were more acceptable to farmers and other local water users. In Boeng Ream, the inclusion of CFis and FWUCs reduced tensions between farmers and fishers by facilitating joint planning and consensus-based scheduling.

It is recommended to institutionalise formal representation quotas for community-based organisations and women's groups within DTWG and DWG-FSN structures, based on the application of agreed criteria to avoid tokenism. This approach will help preserve bottom-up ownership and ensure that district planning remains responsive to local needs.

Financial sustainability requires blended and institutionalised funding—Both DTWGs relied primarily on donor and project-based financing from WorldFish, IWMI, and CDRI for their operations and support. Although limited government co-financing was provided, such as for canal rehabilitation and Fish Day events, there is no established district budget line for DTWG functions. At Boeng Ream, a 27 percent increase in irrigation fee collection in 2025 demonstrated that transparent local financial management can enhance sustainability. However, in the absence of predictable funding for coordination, monitoring, and training, operational continuity remains vulnerable.

Capacity building must be institutionalised, not project-based—Technical and facilitation capacities at district and commune levels remain uneven. Staff changes, limited hydrological and data analysis skills, and dependence on external experts hindered continuity.

In cases where DTWGs members received structured mentoring, such as through Boeng Sneh's lake monitoring training and Boeng Ream's participatory canal management workshops, decision-making demonstrated significant improvement.

Capacity-building should transition from ad hoc project-based training to institutionalised learning systems that are integrated into DANRE budgets and supported by provincial training centres, CARD, and IFReDI. Peer exchanges, cross-district learning, and knowledge-sharing platforms, such as DTWG Telegram groups and community reflection sessions, should be established as permanent components of the DTWG model.

Data transparency and communication strengthen accountability—In both pilot sites, the use of shared monitoring data, joint reporting, and open communication platforms built trust between stakeholders. For example, hydrological monitoring at Boeng Sneh and cross-sector planning meetings at Boeng Ream fostered consensus among irrigation, fisheries, and environment departments. Still, data systems remain fragmented, and institutional memory is easily lost with staff rotation.

Future DTWGs should develop digital, open-access data systems for lake monitoring, irrigation scheduling, and fishery management—accessible to all district and community actors. Institutionalising these tools across districts will ensure transparency, improve decision-making, and create a replicable governance model rooted in evidence.

Provincial and national linkages are essential for scaling—The success of the DTWGs can be attributed in part to support from Provincial WG-FSNs and facilitation by CARD, WorldFish,

IWMI, and IFReDI. These vertical linkages integrated district-level experiences into provincial and national planning frameworks.

To enable effective scaling, these linkages should be formalised to ensure technical oversight, policy guidance, and fiscal support. Scaling efforts require institutional anchoring within CARD and the PWG-FSN structure, supported by formal guidelines on DTWG mandates, budget allocations, and performance indicators. This approach will promote national coherence while maintaining local flexibility.

Adaptive governance and flexibility are key to local relevance—The capacity of DTWGs to adapt to evolving local conditions was a critical factor in the success observed at both sites. In Boeng Sneh, DTWGs responded to drought-induced water scarcity, whereas in Boeng Ream, they managed the balance between irrigation requirements and fish refuge needs. In both contexts, management plans were revised based on real-time data and stakeholder input.

Replication initiatives should emphasise adaptive governance principles, including the promotion of local innovation, context-specific planning, and participatory monitoring, rather than relying on rigid models. Districts should have the flexibility to modify the DTWG framework to address their unique ecological and socio-economic conditions.

Gender and social equity must remain central to DTWG expansion—Even where women's numerical representation in DTWGs remains limited, the evidence suggests their presence matters in concrete and positive ways, both for gender responsiveness and for institutional effectiveness.

First, women representatives within DTWGs—particularly women technical officers from PDAFF, PDOWRAM, health, or CCWC—do increase sensitivity to gendered needs. Interviews and meeting records indicate that women officers are more likely to raise issues related to domestic water access, time burdens, nutrition, home gardening, small aquaculture, and women's livelihood activities, which were previously treated as "household" issues outside core water or irrigation discussions. Their participation helps ensure that extension activities and water-management decisions consider who uses water, for what purposes, and with what constraints, not only how much water is allocated.

Second, being part of a DTWG strengthens women officers' ability to perform their roles. DTWGs provide women staff with a legitimate, multi-sector platform where their perspectives are backed by district leadership and aligned with those of other agencies. Several women DTWG members noted that raising gender or household-level concerns is easier within the DTWG setting than through bilateral sector channels, because decisions are framed as collective, district-endorsed priorities rather than individual advocacy. This support from district governors, commune chiefs, and line departments enhances their confidence and influence.

Third, DTWGs reduce institutional isolation for women officers. By linking them with FiACs, FWUCs, CFR committees, and local authorities, DTWGs help women technical staff translate gender-responsive ideas into coordinated actions, such as aligning home-garden promotion with water availability or integrating small-scale aquaculture into irrigation planning. This cross-sector backing enables more effective outreach and follow-up at the community level.

It is important to ensure that gender equality is mainstreamed into all stages of DTWG replication—from membership design to budgeting, training, and monitoring. Strengthening women's leadership within DTWG subgroups can make scaling more socially transformative

and sustainable. The DTWGs of Boeng Sneh and Boeng Ream (Santuk) demonstrate that district-level coordination can transform fragmented resource management into integrated, inclusive, and adaptive governance.

By applying these lessons, future DTWGs can become permanent decentralised governance platforms that not only coordinate water, agriculture, and fisheries but also advance climate resilience, gender equity, and food system transformation at the district level.

6. Conclusion and recommendations

An examination of the DTWGs in Boeng Sneh (Prey Veng) and Boeng Ream (Santuk, Kampong Thom) indicates that these pilot platforms constitute a significant institutional innovation within Cambodia's decentralised governance of food, water, and ecosystems. Established under the AMD and RAqFS initiatives, which are now advancing under CGIAR Scaling for Impact (S4I) and Sustainable Animal and Aquatic Foods (SAAF) programme, the DTWGs have bridged sectoral divisions among key line departments, including MOWRAM, MAFF, MOE, and MRD. They have also facilitated coordination among government agencies, commune councils, and community-based organisations such as FWUCs, CFis, CFR committees, and ACs.

The pilot initiatives demonstrate that district-level integration can yield substantive governance and agro-ecological outcomes. In Boeng Sneh, enhanced coordination improved water distribution and fishery protection, thereby reducing irrigation-fishery conflicts and supporting the functions of the wetland ecosystem. In Boeng Ream, the DTWG in Santuk achieved tangible results through canal rehabilitation, equitable water allocation, and participatory planning, thereby expanding irrigation coverage and increasing agricultural productivity. These outcomes highlight the DTWGs' role as catalysts for collaborative resource management. The groups have fostered stakeholder trust, promoted shared accountability, and facilitated dialogue across administrative levels. Furthermore, the DTWGs illustrate that gender inclusion, community participation, and transparent communication are critical for establishing resilient local governance systems.

Despite these successes, several systemic challenges remain. The DTWGs are still dependent on project-based support and lack secure operational funding or clearly defined mandates within the national administrative framework. Persistent institutional overlaps among ministries and departments impede effective cross-sectoral collaboration. Data sharing and technical capacity are inconsistent, and although women's participation has increased, leadership positions remain predominantly held by men. Without further institutionalisation, there is a significant risk that DTWG functions will diminish once external project support concludes.

In summary, the experiences of DTWGs in Boeng Sneh and Boeng Ream demonstrate that locally grounded, cross-sectoral coordination mechanisms can convert fragmented governance into collective action for sustainable resource management. However, the long-term sustainability of these mechanisms requires formal recognition, dedicated funding, and integration into Cambodia's broader decentralisation and food security frameworks.

Recommendations

The study has come up with the following recommendations:

1. Institutionalisation and policy integration

- Formalise DTWGs through ministerial or sub-decree recognition, positioning them as permanent mechanisms under the ARD and linked to the PWG-FSN.
- Embed DTWGs within the National Strategy for Food Security and Nutrition (NSFSN 2024–2028) and the Pentagonal Strategy (2023–2028) as the district coordination arm for multi-sectoral governance.
- Develop standardised Terms of Reference (ToRs), reporting templates, and coordination protocols to ensure institutional continuity and accountability beyond project cycles.

2. Financial sustainability

- Establish dedicated district-level DTWG operational funds, co-financed by provincial budgets, Commune Development Funds (CDFs), and development partners, ensuring predictable resources for meetings, field monitoring, and data reporting.
- Introduce cost-sharing models with FWUCs, CFis, and private actors (such as irrigation service users or agro-enterprises) for joint maintenance and monitoring of shared infrastructure.
- Encourage local governments to include DTWG activities in district investment plans and budget frameworks, ensuring their institutional presence within Cambodia's fiscal decentralisation process.

3. Strengthening technical and data capacities

- Equip DTWGs with shared information systems for hydrological data, land use planning, and ecological monitoring—integrating inputs from PDOWRAM, PDAFF, and commune councils.
- Conduct regular capacity-building programmes for district officers, commune councils, and community committees on topics such as integrated water management, gender-responsive planning, and ecosystem-based adaptation.
- Promote the use of digital tools (GIS mapping, mobile-based data collection, and Telegram communication groups) to enhance coordination, transparency, and real-time decision-making.

4. Enhancing gender and social inclusion

- Institutionalise gender focal points within each DTWG and ensure that CCWC, youth representatives, and marginalised groups have active roles in decision-making.
- Strengthen women's technical participation in irrigation, aquaculture, and water planning through targeted leadership and skills development programmes.
- Support gender-disaggregated monitoring of livelihood outcomes to track inclusion and equity impacts.

5. Scaling and replication

- Use lessons from Boeng Sneh and Boeng Ream as a national learning model for expanding DTWGs to other districts across floodplain provinces—particularly around Tonle Sap, Stung Sen, Kampong Thom, and Prey Veng.
- Facilitate cross-provincial learning exchanges to disseminate tools, governance models, and success stories that can guide replication under diverse ecological and socio-political conditions. Establishing an online 'community of practice' platform for this purpose may also facilitate peer-to-peer learning between DTWGs by sharing their experiences and learning for managing shared challenges.
- Collaborate with CARD, MOWRAM, and MAFF to design a national guideline for DTWG replication, defining methodologies, roles, functions, coordination hierarchies, and performance indicators.

6. Monitoring, learning, and adaptive governance

- Develop joint monitoring systems that link DTWG reporting with national databases, such as those managed by the MOWRAM and the MAFF, with measurable indicators on water governance performance, institutional coordination, and community outcomes.
- Institutionalise annual joint reflection meetings among provincial, district, and commune levels to assess progress, share experiences, and revise work plans adaptively.
- Encourage partnerships with research institutions (CDRI, IFReDI, IWMI, WorldFish) to provide continuous evidence and technical support for adaptive learning and policy feedback.
- Formalise coordination protocols between DTWGs and PWG-FSNs, ensuring DTWGs are integrated into provincial and national planning cycles.
- Establish a DTWG-FSN operational fund supported by CARD and provincial budgets, incorporating donor matching mechanisms.
- Strengthen partnerships with the private sector to facilitate co-investment in irrigation and wetland conservation.
- Integrate DTWGs into the NSFSN 2024–2028 monitoring and evaluation (M&E) framework, enabling performance-based financing from the national budget.

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