



Bridging the Irrigation Governance Gap: Strengthening Climate Resilience through the Integrity Management (IM) Toolbox in Banteay Meanchey

Authors:

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Purpose:

This case study was developed as part of the Nurture Project's interim evaluation to document key achievements and lessons learned from the implementation phase.

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1. Introduction

Nurture Project Overview

Nurturing Climate Resilience in Cambodia (Nurture) is a four-year collaborative initiative among HEKS/EPER, Caritas Switzerland, the Ministry of Water Resources and Meteorology (MOWRAM), and the General Directorate of Agriculture (GDA). Co-financed by the Swiss Agency for Development and Cooperation (SDC), the project strengthens the climate resilience of smallholder farmers (SHFs)

Intervention Scope

While traditional interventions often focus on the physical construction of canals, Nurture recognises that infrastructure without governance is a stranded asset. At the heart of this strategy is the Integrity Management (IM) Toolbox, a participatory tool for Farmer Water User Communities (FWUCs) to manage small- and medium-sized irrigation schemes

through three interventions: local water governance; policy and planning on climate adaptation; and climate-resilient agriculture and market development. By enabling private-sector actors and farmer organizations to adopt and scale commercially viable, climate-resilient practices, Nurture facilitates improved decision-making, productivity, and market access for vulnerable rural households.

transparently and collaboratively across four project target provinces: Battambang, Banteay Meanchey, Oddar Meanchey, and Preah Vihear. By mid-2025, the intervention had reached 18 FWUCs, moving beyond mere "hardware" to address structural constraints in transparency, accountability, and coordination.



Epkheap FWUC Deputy, Mr. Set Run, presenting progress to local authorities and technical departments (PDAFF, PDWRAM, DoA), 2025
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2. The Context: Governance Gaps and Climate Vulnerability



Technical inspection of water gate functionality in Banteay Neang Commune, 2024 ©Nurture Project



Infrastructure maintenance: Replacing a broken water gate in Banteay Neang Commune, 2024 ©Nurture Project

This case study focuses on the Banteay Neang Commune in Mongkol Borey District, Banteay Meanchey Province. Despite access to canal networks, the community faced systemic integrity risks and coordination failures before interventions. The challenge was not merely a lack of water but a lack of effective governance mechanisms to manage and coordinate water allocations. The 856 farming households in Phum Kok Pnov operated under fragmented coordination. Farmers navigated an environment of "water chaos," where upstream users often monopolised resources, leaving downstream farmers, particularly widows and low-income households, to face frequent shortages, resulting in conflict between upstream and downstream users.

At the governance level, the FWUC had limited experience in transparent water allocation, fee collection, and financial management. It was also highly dependent on provincial authorities for planning and decision-making, undermining local ownership and responsiveness. Coordination among the FWUC, local authorities, PDWRAM, and PDAFF was weak, and irrigation issues were rarely discussed collectively. As a result, water conflicts arose, and farmers had limited confidence in long-term solutions. Overall, governance deficiencies and unstable access to water led to lower yields and income insecurity for farmers.

Box 1: Core Challenges

- **Governance:** Weak FWUC leadership, lack of financial transparency, and limited farmer engagement.
- **Coordination:** Fragmented links among FWUC, PDWRAM, PDAFF, and local authorities.
- **Planning:** Absence of shared cultivation calendars leading to "water chaos" during rainfall uncertainty.
- **Equity:** Capture of water by upstream users; marginalization of downstream users.

3. Intervention: The IM Toolbox Approach

The IM Toolbox is an integrated and participatory methodology that treats water as a shared public trust. Unlike traditional hardware-only projects, the Toolbox prioritises the "software" of rules, roles, and records.

Nurture addressed systemic failures through a dual-track approach. The project supported the construction of supplementary irrigation infrastructure, such as the Jerng K'arb canal, to resolve physical distribution issues. However, it was further strengthened by the IM Toolbox.



Participants of the workshop on Finance and Administration, Operations and Maintenance, and Water By-laws, in Kok Pnov village, Banteay Neang commune ©Nurture Project



Workshop on Finance and Administration, Operations and Maintenance, and Water By-laws, in Kok Pnov village, Banteay Neang commune ©Nurture Project

Box 2: Key Action Pillars

- **Strategic Infrastructure:** Targeted construction of the Jerng K'arb canal to unlock physical bottlenecks.
- **Integrity Instrument:** Developing transparent water distribution plans and cropping calendars based on real-time water availability.
- **Multi-Stakeholder Diplomacy:** Facilitating coordination across six communes to align rice cultivation with available water resources.
- **Accountability Mechanisms:** Strengthening fee collection systems with clear financial reporting to build farmer trust.
- **Social Equity:** Implementing pro-poor policies, such as mandated water user fee discounts (50%) for vulnerable groups (widows, low-income families).

Instead of imposing external rules, the IM Toolbox empowered the FWUC to lead its governance reform. This included developing inclusive cropping calendars and water distribution plans based on actual water availability. To ensure integrity, the project facilitated multi-commune coordination meetings across six communes, aligning thousands of hectares of rice production with available resources. This process was supported by a renewed focus on financial accountability, with fee systems professionalised and, crucially, social protection measures, such as 50% fee discounts for vulnerable groups, institutionalised to ensure that irrigation served the entire community.

Business Model Logic

The IM Toolbox serves as a governance catalyst. It removes institutional barriers that prevent irrigation from being a viable service. By professionalising the FWUC and generating revenue streams (from fee collection) that can support the ongoing operation and maintenance of the irrigation systems, the toolbox supports more sustainable and equitable water management.

Partners and Roles

FWUCs and Farmer Water User Groups (FWUGs) are the primary implementers and groups that benefit. PDWRAM provides technical oversight and coaching, while PDAFF and Commune Agriculture Officers support agricultural planning and the preparation of cropping calendars. Nurture facilitates capacity building, coordination, and monitoring. Private-sector partners, including Eco Green Energy Cambodia (EGE-Cambodia), integrate IM Toolbox principles into irrigation service business models (in Battambang province).

4. Progress and Results: Strengthening Trust and Productivity



Stakeholders from PDAFF, PDWRAM, and local authorities engage in a group discussion during the IM Toolbox Progress Review in Kok Pnov village, Banteay Neang commune, 2024
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Stakeholder mapping session during the IM Toolbox Progress Review in Kok Pnov village, Banteay Neang commune, 2024
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The results of this integrated approach have been systemic. By professionalising the "rules of the game," the project has replaced conflict with coordination. Farmers reported a significant decline in water-related disputes. The introduction of shared calendars meant that farmers no longer "raced" for water; instead, they followed a predictable, transparent schedule, resulting in higher rice yields and greater income security.

With improved financial transparency, farmers showed a greater willingness to pay Water User Fees. Additionally, farmers previously limited to a single wet-season crop began adopting more consistent production cycles. Vulnerable households are no longer

- passive recipients; they are now active members and have gained access to affordable services. The significant changes at the outcome level include:
- **Strengthened FWUC Governance and Institutional Coordination:** Farmers noted that FWUC's capacity enhanced their ability to manage water distribution, collect fees, and resolve disputes. PDWRAM and PDAFF improved coordination with FWUCs and commune authorities, shifting from irregular involvement to more organised support aligned with cultivation schedules and water resource availability.

- **Improved Water Access and Reduced Conflict:** Farmers reported that the Jerng K'arb canal and the restored secondary canals improved physical access to irrigation water, especially for those far from the main canal. When combined with shared cultivation and irrigation planning, this improved water distribution, making it more predictable and transparent. Consequently, water-related conflicts declined substantially, and farmers' trust increased.
- **Progress in Productivity and Resilience:** Farmers reported that improved irrigation access and management enabled them to adopt better cultivation techniques and

adapt to climate variability. They observed positive trends in rice yields and food security, with stable household incomes. The ability to use land previously constrained by water indicates progress toward a more resilient agricultural system.

- **Stronger Inclusion and Equity:** Farmers observed that vulnerable households benefited not only from improved physical access to water but also from social protection measures, such as 50% discounts on water fees. Community processes promoted inclusive participation, giving women and marginalised farmers a voice in decision-making.

Box 3: Stakeholders' Perspectives

- "... the project provided both software and hardware support. On the software side, it delivered training and strengthened farmers' capacity. On the hardware side, it constructed irrigation infrastructure, including the Jerng K'arb canal. This dual approach made the difference." – PDWRAM, Banteay Meanchey Province.
- "... before the project intervention, poor planning limited irrigation to 50–60% of the command area, affected 1,556 households, and covered 1,066 hectares, resulting in yields of 3–3.5 tonnes/ha. Following the introduction of a crop calendar and coordinated water distribution, we achieved nearly 100% coverage, and yields have risen to 4–5 tonnes/ha. Furthermore, we have institutionalised support for vulnerable families, including widows and low-income households, by providing a 50% discount on water service fees." – FWUC Representative, Banteay Meanchey Province.

5. Lessons Learnt

The Banteay Meanchey experience offers a critical lesson for climate resilience programming: irrigation management is as vital as the irrigation infrastructure itself. The IM Toolbox acts as a multiplier for infrastructure investments. When farmers help design the rules, they are more likely to comply. Furthermore, the inclusion of equity mechanisms, such as targeted water-user fee discounts, show that social justice is also a resilience strategy: a community that protects its most vulnerable is more cohesive and better equipped to handle climate shocks. The case shows that financial transparency and leadership capacity are critical foundations of a sustainable irrigation system.

Ultimately, the evaluation indicates that focusing solely on yield indicators underestimates the IM Toolbox's value, as governance enhancements, coordination, and financial sustainability are key components of the overall impact pathway.

Box 4: Key Lessons Learnt

- Infrastructure achieves little without governance
- Integrity sustains system functionality
- Equity is a resilience strategy
- Success should be assessed by institutional maturity, not only by crop yields
- Effective governance is the foundation of all other impact

6. Sustainability and Ways Forward

The legacy of the IM Toolbox lies in its integration into the Cambodian government's existing irrigation governance framework. By aligning FWUC activities with Commune Investment Plans and PDWRAM's budgeting processes, the intervention can move beyond project-based funding towards institutional sustainability. As farmers see the tangible benefits of reliable services, their willingness to pay water user fees increases, creating a localised revenue stream for future operations and maintenance.



IM Toolbox Progress Review: Group discussion presentation involving water users, local authorities (CAO, CC, Village Chief), and technical line departments at FWUC Ekpheap, 2024 ©Nurture Project

Box 5: Key Priorities

- Scaling: Replicating the “IM Toolbox + Selective Hardware” model in other FWUCs.
- Integration: Strengthening FWUC engagement in Commune Investment Plans and PDWRAM budgeting.
- Capacity Building: Continuing technical training and post-training monitoring.
- Engagement and partnership: Strong engagement and partnership between FWUCs and private-sector agricultural service providers.

In the study area, the IM Toolbox approach demonstrates strong sustainability potential by building local capacity, establishing shared rules, creating financial mechanisms, and developing fit-for-purpose infrastructure. Farmers expressed a commitment to continuing cultivation planning and water governance practices even without external support.

Moving forward, the priority is to reinforce these institutional gains. While the IM Toolbox and selective infrastructure investments require initial project facilitation, their value lies in institutionalising transparent governance and building the capacity for sustained, locally financed water management. By aligning with government planning and budgeting systems, Nurture ensures that future support and investment are system-driven rather than project-dependent.



Stakeholders from the Nurture project, FWUC Ekpheap, and government technical departments gather during the IM Toolbox Progress Review in Kok Pnov village, Banteay Neang commune, 2024 ©Nurture Project



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