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SWP
SUSTAINABLE WATER PARTNERSHIP

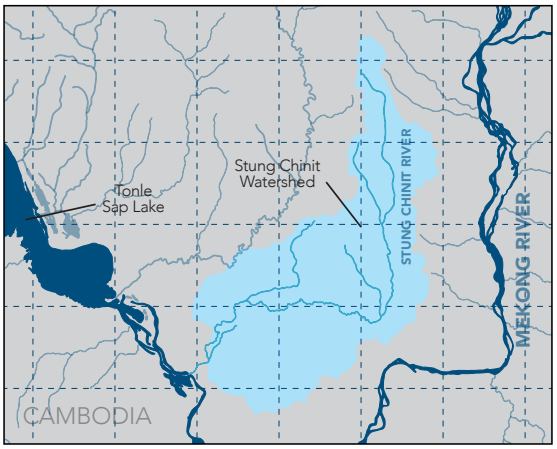
Engaging Farmers to Improve Management of Irrigation Infrastructure

A WATER SECURITY CASE STUDY

Challenge: Building the capacity of farmers to understand and manage irrigation infrastructure

Cambodia's Stung Chinit basin (Figure 1) has the potential to be the rice bowl of Cambodia, but its 20,000-hectare irrigation system has only served approximately 3,000 hectares since construction was completed in 2008. Most Farmer Water User Communities (FWUCs) managing the twelve irrigation schemes within the system have been unable to distribute water equitably and reliably to their members. The lack of effective management by FWUCs has led to conflicts between farmers and deprived downstream users of water, compromising crop yields. Problems include non-payment of fees for irrigation water and individual actions by farmers to open irrigation gates when they need water outside of scheduled deliveries.

FIGURE 1: THE STUNG CHINIT BASIN



WINROCK INTERNATIONAL

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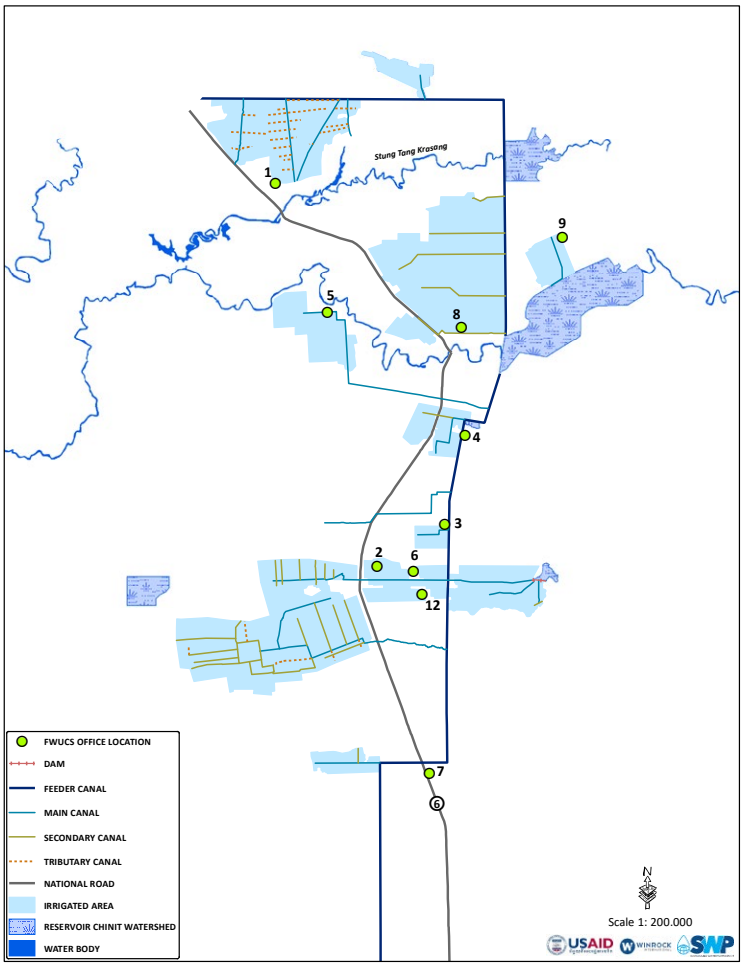
In 2017 the USAID-funded Sustainable Water Partnership (SWP) initiated a four-year activity in the Stung Chinit basin to build resilience to growing water security risks using SWP's Water Security Improvement (WSI) process. The WSI process is a series of steps that build the capacity of stakeholders to address water-related risks in a specific geographic area. SWP engaged local stakeholders to conduct a water security assessment, which confirmed that irrigation management was a key water security risk in the Stung Chinit basin. Stakeholders formed a working group to discuss irrigation-related risks and create a Plan of Intervention to address the risks. The Plan of Intervention prioritized demonstrating a water distribution schedule to be implemented by two FWUCs. SWP's local partner, the Irrigation Services Center (ISC), used drones to map the Chhuk Khsach (#10) and Hun Sen Baray (#11) irrigation schemes (Figure 2), confirmed the owner of each plot of land within the scheme, and worked with FWUC members to implement a water distribution schedule for each scheme. Over one cropping cycle, the schedules achieved timely and equitable water distribution to farmers and de-escalated water-related conflicts.

However, the FWUCs had relied heavily on ISC to design, implement, and monitor the water distribution schedule, and felt unprepared to independently replicate the schedule in future seasons. FWUC members lacked an understanding of the scale, infrastructure, boundaries, and functioning of the irrigation scheme serving their community. For example, when asked to locate a release gate on their own property on a map of the irrigation scheme, many FWUC members were unable to do so. FWUC members would need a clear understanding of the irrigation scheme in order to implement water distribution schedules on their own.

FIGURE 2: THE STUNG CHINIT IRRIGATION SYSTEM



Map ID: WINROCK-SWP-0000105 Date: 06-10-2020 Irrigation data sources : ISC

Intervention: Facilitating a participatory "irrigation game"

In early 2020, ISC held a four-day workshop for each FWUC to increase their understanding of how their irrigation scheme works. ISC created an applied game using wooden blocks, paper, and gameboard pieces to represent irrigation scheme components, and assisted FWUC members to build a scale replica of their community's irrigation scheme (Figure 3). Participants started with the main canal and added the distribution canals and gates, measuring the correct lengths with guidance from ISC.

FIGURE 3: AN FWUC MEMBER SHARES HIS OPINION ON COMMUNITY WATER SHARING USING THE SCALE MODEL OF THE HUN SEN BARAY IRRIGATION SCHEME

Once the model was built, participants used the model to:

- Review all of the irrigation infrastructure and note any parts of the scheme that were not working properly or needed maintenance;
- Simulate opening and closing various irrigation gates to see how the water flows would affect downstream farmers;
- Discuss the volume of water available during different times of year, who was currently using the water, potential sources of conflict over water, and how to resolve conflicts through the FWUC; and
- Calculate the volume of water required to irrigate selected plots of land, using glass marbles to represent water quantities.

These exercises confirmed that if each irrigation scheme was centrally coordinated by the responsible FWUC, there would be sufficient water available for all members. Learning from the irrigation game was reinforced through field visits to parts of the irrigation scheme, including a canal maintenance initiative organized by an upstream FWUC (Figure 4). SWP provided additional training to participating FWUC members on how to manage the FWUC, including roles and responsibilities of the FWUC board and members, and best practices for inclusive, transparent decision-making.

FIGURE 4: FIELD VISIT DURING FWUC TRAINING TO OBSERVE CANAL MAINTENANCE IN KAMPONG THMAR COMMUNE, SANTOUK DISTRICT, KAMPONG THOM PROVINCE.

Results

The participatory irrigation game delivered two key results that will help the FWUCs with improved irrigation management in the future. First, the game increased participants' understanding of their irrigation scheme, including how their scheme functions within the larger irrigation system, and the importance of conducting timely maintenance (see box). These skills will allow the FWUCs to implement and monitor their own water distribution schedule in future crop seasons. Second, the game generated demand to expand its use as a teaching tool. FWUCs reported the successful game and trainings to the Stung Chinit River Basin Management Committee, which was working with stakeholders to draft the basin water security Strategic Action Plan. The Plan, which was approved in 2020, includes a proposal to scale up the irrigation game and associated trainings to cover the entire Stung Chinit Irrigation System.

> "The game was so important, it helped me and other participants to understand our scheme collectively...From the game, as one of the FWUC Committee members, I did use the comments/ feedback from other participants to reflect with the current situation of the identified specific infrastructure. Those specific infrastructure [items] have been listed and planned for maintenance in the next actions of the FWUC.
>
> **– MR. KHUT SAVOIN**
> Vice Chairman, Hun Sen Baray FWUC

Lessons Learned

Participatory, hands-on exercises to create a scale model of irrigation infrastructure are an effective way to build capacity of FWUC members. Lessons learned from SWP and ISC's use of the applied irrigation game include:

- Applied games are a low-cost and efficient method for increasing stakeholder knowledge and skills related to water resources management, particularly for stakeholders with low levels of literacy.
- Applied games can help facilitate stakeholder participation in the WSI process by rapidly increasing their water resource knowledge and skills. The irrigation game helped FWUC members understand how their irrigation scheme functions as well as how to calculate the volume of water needed to irrigate specific crops.

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ABOUT THIS SERIES

This case study is part of a series of products of approaches under the Water Security Improvement (WSI) process. This series is produced by USAID's Sustainable Water Partnership (SWP) activity and can be found here: www.swpwater.org.

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