Challenges in Water Resource Management for Farmer Water User Communities

Kim Sean Somatra and Khiev Daravy report on a social assessment of water resource management in the Tonle Sap basin and discuss issues of water allocation, people's participation, irrigation system operation and maintenance and conflict resolution that can potentially affect local water governance.*

"Every year, growing rice is a gamble against the rain. You don't know what to expect."—A farmer in Srah Reang, Banteay Meanchey

"Cambodia's farmers are poor because they don't have water to irrigate their fields."—Commune council member, Srah Reang, Banteay Meanchey

The above quotes capture an important aspect of the water problem in Cambodian agriculture, on which almost 80 percent of the population depend directly or indirectly. Realising the important role irrigation can play in national development, the government has focussed particular attention on irrigation, which has a great potential to benefit Cambodian farmers. Irrigation makes farmers less dependent on rain and brings more predictability and certainty to wet season rice production. At the same time, Cambodian farmers are now enjoying more cropping density, growing rice two or, in some cases, three times per year. With rice being the predominant staple, and sometimes cash crops, which is a big source of employment for Cambodian population, growth in this sector does not only mean economic growth but also better income distribution. In addition, irrigation has made it possible for farmers to grow a range of cash crops such as vegetables, watermelons and corn.

However, the construction of irrigation systems alone is not enough, and some issues related to governance need to be looked at if irrigation systems are to be successful. In this article, we report on a social assessment of water resource management associated with 18 irrigation schemes in the Tonle Sap basin. Based on our study's initial findings, the article discusses issues of water allocation, participation, operation, maintenance and conflict resolution that can potentially affect local water governance.

Background of FWUC

It is estimated that 90 per cent of the irrigation systems in Cambodia were built during the Khmer Rouge regime. Many of these were poorly designed, and after the collapse of that regime in 1979, most irrigation systems were neglected to the point that they became no longer functional, leaving the production of rice totally dependent on rainwater. Most rice fields are rain-fed, and rainfall is often irregular. A delay in rainfall at the beginning of the wet season causes disruption or even the failure of cultivation for the whole season. In addition, a small dry spell in the middle of the wet season, when rice plants most need water, can cause the crop to fail.

To mitigate problems of water supply and achieve more growth in agriculture, the government has emphasised irrigation, building infrastructure and strengthening the management system. Starting in 1993, the management of water resources has been transferred from the centrally managed system to local management. NGOs and donors introduced the concept of participatory irrigation development management (PIMD), which emphasises local participation. It requires decisions to be made at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of projects (ICWE 1992). It is argued that involving local people in the development makes a project more politically and socially acceptable (Schumacher 1973; McDonald and Kay 1988; Ojendal 2000) because people can communicate their needs and make the work represent their interests. The outcome, it is argued, provides more sense of ownership among the local people (Moote et al. 1997). Technical traditional knowledge brought in by local people can be of major practical value for the management of water resources, whether it is water harvest, river basin management or irrigation.

Central to PIMD in Cambodia are farmer water user communities (FWUC), which are established to manage an irrigation scheme in a democratic manner. According to the law, farmers in the command area have to apply for membership in order to use water from the scheme and in doing so farmers agree to contribute by paying fees. In addition, FWUC are entitled to impose fines or prosecute people who interfere with or harm the interests of the FWUC or their members (MOWRAM, 2000). But it is not clear to what extent FWUC are compatible with existing arrangements shaped by local norms, beliefs, social capital (trust and networks) and politics. Ojendal (2000) warns that managing a resource that has always been free is "tricky", and whether local institutions such

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as FWUC can manage water in a manner that ensures economic growth, social equity and financial and environmental sustainability is a big question.

Findings

Water Allocation within Schemes

FWUC face great challenges in allocating water within the schemes among the farmer members—usually dry season rice farmers. Dry season in Cambodia lasts around three months, starting in December and finishing in March, and often there is not enough water to last through the cultivation period. Seeing their crop at stake as the water runs out, farmers want to extract as much water as they can into their fields before the river dries up, and this leads to fierce competition. In the case of the Trapaing Trabek scheme in Kompong Chhnang, the FWUC, in trying to make a fair allocation among its members, sought assistance from the commune council, which issued a letter instructing people to share water equally. But the farmers completely ignored the allocation arrangement, saying, "We eat rice. We do not eat paper".

Water supply scheduling is also a big challenge for most of the FWUCs. One FWUC in Battambang, for example, from experience, comes up with an arrangement they think would best help them allocate water. The arrangement is that when the main water gate is open and there is water in the main canal, farmers located in the downstream are entitled to use water to cultivate their land first until their rice plants are big enough to withstand water. Then, people upstream could start to cultivate. But the plan has so far failed. The farmers just ignore the arrangement and the upstream people would build a makeshift dam across the canal to divert water to their field as soon as there is water coming while the FWUC could only watch helplessly.

Allocation of Water between Schemes

Another challenge for FWUC is in water allocation between different irrigation schemes in the same catchment due to a mismatch between the catchment's capacity and the demand for water. Irrigation schemes built during the 1980s and 1990s were designed, financed and constructed by different agencies such as the American Friends Service Committee and Programme de Rehabilitation et d'Appui au Secteur Agricole du Cambodge. In the example of Steung Chrey Bak catchment, Kampong Chhnang province, no comprehensive studies of catchments were conducted before designing individual schemes because during that time a large part of the country was still under the control of the Khmer Rouge and fighting in those areas was frequent. In most cases, schemes were built primarily to provide emergency supplementary water for wet season rice and for flood control. For security reasons, they were first built in the downstream part of catchments, in secure zones. As peace and stability expanded, development activities and irrigation work also expanded. More schemes were added upstream, enabling people there to extract and exploit water. However, the upstream schemes mean a reduction in the quantity of water available to people downstream and the more schemes there are upstream, the less water there is downstream.

In addition to competition between schemes for supplementary water, expansion of dry season cultivation, made possible by irrigation, has led to direct competition within and between schemes. In principle there is a limited and agreed area that can be irrigated during the dry season from each scheme. In practice, it is often difficult to limit cultivation to this area.

Another challenge in allocating water between schemes is the problem of poor coordination and cooperation between FWUC. Water courses cut through different jurisdictions, flowing through different provinces, districts, communes and villages, which have their own FWUC. It is often not possible for FWUC to share information about what happens in each area, and they make decisions independently of each other. It is often the case that a decision of an upstream FWUC causes tremendous effects for a downstream FWUC. For example, an upstream FWUC sometimes retains all the water for its own use, causing a shortage downstream when rice needs water the most, while at other times releasing all the water would flood the area when rice is being harvested. The operations of each scheme are interconnected. This makes close cooperation between schemes in a catchment very important. FWUC, although responsible for different schemes in different jurisdictions, need constantly to communicate with one another to create a master plan for water.

Participation

The success of local management of water depends on people's participation, which, according to the literature, can bring practical technical knowledge and, more importantly, make people feel a sense of ownership. However, trying to get farmers to participate in the management or to make use of water from the schemes is probably as hard as trying to allocate water among them in times of scarcity.

FWUC experience great challenges in trying to get people to participate. In some areas, after irrigation schemes were built or restored, there is plenty of water in the system, but farmers do not make use of it. In some areas, FWUC, trying to get local people to participate, also face farmers' long-standing traditions. Traditionally, they grow wet season rice in a very relaxed manner. According to FWUC in Kompong Thom, when growing wet season rice, farmers only plough the field and spread the seeds, and do nothing else until harvest time. By comparison, dry season rice requires farmers to spend a

lot more time in the field to control water and ward off animals, which by tradition are let loose in the dry season. At the same time, there is more cost involved; farmers have to pay water fees which they would not have to pay for wet season rice. Dry season rice also requires more fertiliser.

Despite all the extra work and extra costs, there is no guarantee of success, because farmers later face destruction by pests. In the wet season almost all of the land is cultivated, so destruction caused by pests is relatively small. Dry season rice covers a much smaller area, which means that pest destruction is high because the number of pests per cultivated area is higher. As one agricultural extension officer in Pursat put it, "Growing dry season rice is like opening a restaurant for rats".

In other areas, such as Pursat and Siem Reap, farmers do not use irrigation due to extreme poverty. Some farmers cannot make use of irrigation schemes because, instead of growing dry season rice, they go to work as labourers in the city, collect firewood or collect marble, things that can quickly produce cash. The effect of poverty can also be observed in poor people selling their land for a high price and buying another plot that is cheaper but distant from an irrigation area.

Whether it is because of tradition or extreme poverty, the fact that people are not using irrigation or paying irrigation fees has a serious impact on the overall performance and success of FWUC. FWUC depend heavily on the contributions of members. The FWUC law, Article 24, calls for farmers who benefit from the schemes to pay user fees. But historically, Cambodians grew rice relying entirely on rainwater and never paid water fees, so the idea of having to pay to use water is sensitive, and politics makes it worse. Local leaders of political parties use irrigation as an object of political manipulation. People are told not to pay the fees because the state builds the irrigation scheme and it is built for the people to use. Another aspect of political influence on irrigation is that before an election people are asked to vote for a party that promises to abolish irrigation fees. How does fee collection affect the functioning and sustainability of FWUC?

Operation

Technical flaws in the design of schemes are great challenges for FWUC operations and maintenance. In the case of Trapeang Thma in Banteay Meanchey, the main water gate was a log-stop door. People could regulate the amount of water flowing to their rice field by manually adding or removing the wooden door. But at the last restoration, the door was modified and is now automatic. This door is supposed to regulate water by itself in order to reduce the workload of the FWUC, but it has not worked properly. According to the local FWUC, the door would lower itself when there was too much water in the reservoir, but it could not rise up to retain water at the desired level. The new door tends to empty the reservoir and flood rice fields downstream.

In addition, the ability of FWUC to provide adequate water supplies to farmer members is constrained by physical conditions. Most irrigation schemes are incomplete. Trapeang Thma, for example, has only the reservoir, while the main channel is badly damaged, and there is no tertiary channel system in place. Likewise, the main canal that brings water to the Srah Reang scheme in Banteay Meanchey is also badly damaged. According the chief of the FWUC there, the main canal is broken at 13 different places due to a severe flood the previous year. Because of the bad condition of the canal, the FWUC could not respond to the needs of farmers on time. One farmer member said, "Last year I requested water from the FWUC in November, and they went to the commune upstream to negotiate the release of water. At the same time, I started to cultivate my land, and then we waited for the water to come. We waited and we waited. Finally, water came, one month after I sowed the rice seed. It was too late. The crop was already dead."

In water governance, limited resources are also a big constraint. The expected sources of revenue of the FWUC are funds from the government, NGOs, irrigation fees and FWUC business activity. But revenue from government, NGOs and business activity has been little or nothing, and FWUC can barely collect the irrigation service fees. With limited revenue, FWUC fail to perform their functions effectively because the committee members are paid only 10,000 to 20,000 riels per annum, barely enough to cover the cost of gasoline of one trip to negotiate with the commune upstream, not to mention that every time they travel, they use their own means of transportation.

In addition, the farmer members do not make the committee members' lives any easier. As discussed earlier, the amount of water available in a scheme, either too little or too much, is determined by the schemes upstream, but people put the blame only on the FWUC in their own area. One committee member said: "In one cultivating season, we get cursed three times. We get cursed when there is a water shortage that damages crops. We get cursed when flood water from upstream damages crops, and we get cursed when we go to collect the irrigation service fees".

This poses a serious threat to the sustainability of FWUC membership, as captured by a comment by one FWUC committee member in Kompong Chhnang who said, "Perhaps we should quit, because we do not get money for our service, but blame". The FWUC in Thnal Dach, Banteay Meanchey, for example, had five committee members, but now only three remain. The same thing is true of FWUC in Kamping Puoy, Battambang, Kampang, Pursat, Me Tuek, Pursat, and Tang Krasang,

Kompong Chhnang. The chief of the FWUC in Tang Krasang put it: "Before, the committee members were enthusiastic about irrigation management, but now everyone is de-motivated because there is no pay".

Maintenance

FWUC also suffer from a lack of resources to maintain schemes. Irrigation schemes are prone to damage by erosion, flooding, animal destruction and theft of components such as steel bars and wooden doors. Often the cost of maintenance exceeds the financial ability of FWUC, whose revenue depends on irrigation fees that they can hardly collect, if at all.

What is worse is that FWUC are sometimes required to fix schemes located in other territories. The FWUC in Srah Reang, for example, is responsible for maintaining Pou Pir Daeum scheme, upstream. The main canal that brings water to their area cuts through Pou Pir Daeum and is broken in many places. However, farmers in Pou Pir Daeum do not grow dry season rice, so they are not interested in fixing the canal, leaving the responsibility in the hands of the Srah Reang FWUC.

Some FWUC have attempted to incorporate building of irrigation systems into commune council planning, but experience shows that the chance of irrigation being included in commune development plans is very slim. "We have tried to incorporate irrigation into the commune development plan, but irrigation cannot defeat roads", said one FWUC member in Kompong Chhnang.

Conflict and Resolution

The literature on conflict resolution in water management in Cambodia is very limited, but international experience shows that conflicts between water users arise as a result of decentralisation (UNDP 2006). Most local conflicts concern allocation of water between schemes, and they occur between late February and early March, when farmers need water for their dry season rice. For example, in 2006 dry season rice in Trapeang Trabaek, Kompong Chhnang, was growing very well until there was a water shortage in late February. With limited information about the water flow regime, farmers in this area felt that the shortage was caused by the FWUC and people upstream, who envy their prosperity from dry season rice. "So they stopped all water from flowing downstream", said the farmers downstream.

However, there is no clear regulatory framework (Sakhon and Lyda 1996), at least not yet, to resolve conflicts, and in most cases farmers and their FWUC use personal solutions to solve their problems. For example, seeing their crops in jeopardy, the farmers raised money among themselves for the FWUC to travel to Tang Krasang to negotiate the release of water. Negotiations are usually informal. If any FWUC needs water, it takes along food and wine when it goes to negotiate.

The release of water upstream does not often guarantee that it reaches the scheme downstream. People tend to think that when water flows through their jurisdiction, it belongs to them, and they have the right to do with it whatever they want. In Kompong Thom, Kompong Chhnang and Banteay Meanchey, farmers build makeshift dams to divert water into their fields, causing disruptions to water governance arrangements. However, FWUC have not been able to order the removal of the dams.

Conclusion

Management challenges faced by FWUC can take root in the design stage, raising a question of whether management and governance of schemes can be addressed early on. At the same time, it is interesting to ask broader questions on the political economy of irrigation. Why are projects built where they are? Why don't farmers respect the legitimacy of FWUC? Is an FWUC a real local water-governing institution with legal support, or is it just a precondition of some sort? Finally, what are the reasons for the lack of coordination and cooperation between different FWUC, and what can be done to make them happen? Only when these issues are addressed will it be possible to talk about effective water management by FWUC.

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