

The study below is an initiative undertaken under the [ADB- Global Water Partnership Southeast Asia Technical Advisory Committee \(GWP SEATAC\) partnership](#) to document and improve innovative local IWRM initiatives in the Southeast Asia region.

Integrated Water Resources Management: Practical Experiences and Successful Lessons in Bac Kan Province, Vietnam

Background

Bac Kan, located on the highest altitude among 11 mountainous provinces in the northeast region, is a poor province of Vietnam. Most (95%) of the province's land area is forested while the rest have been converted to agriculture. The topography is so strongly varied that economic development has not taken off, and local residents have faced difficulties particularly in accessing water for domestic use and agricultural cultivation. Residents have consequently depended on forest resources resulting to the depletion of the watersheds and the degradation of the environment.

Community efforts with support from the government and NGOs, however, have recently contributed to the implementation of good water management practices in the area. In some localities such as Bach Thong, Cho Moi and Cho Don, Water Users Associations (WUAs), wherein local residents actively participate in activity planning, implementation and management of water resources projects, have been established to respond to the water shortage problems. At the moment, WUAs focused their activities largely on water use for agricultural production and very little on coordination with other water users.

The purpose of the pilot study is to document practical experiences and lessons learned in the community management of water resources and to provide support to local communities in improving their water management processes and system for better implementation of IWRM in Bac Kan province.

Specifically, the objectives were:

- To document experiences, successes, and lessons learned in community management of water resources such as participatory irrigation management, water supply, watershed protection, and environmental sanitation, among others, in some localities in Bac Kan provinces;
- To disseminate and strengthen local community and institutional capabilities in the implementation of IWRM;
- To provide support to local Water Users Associations and community development institutions to enhance their capabilities in implementing integrated water resources management.

The pilot study was conducted by the Vietnam Water Partnership (VNWP).

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The Project Site

Majority of Bac Kan's province's land is forested, i.e., 95.3% out of 4,793.84 km² of natural area (Table 1). Bac Kan lies completely within the tropical monsoon region with two distinct seasons: rainy season from May to October and dry season from November to April. The total amount of rainfall during the dry season accounts for only 10-12 % of total annual rainfall. As a result, water shortage is commonly experienced during the dry season.

Table 1. Land classifications in Bac Kan Province, Vietnam

No.	Land Category	Areas (hectares)
1	Agriculture Land	30,508
2	Forestry Land	301,722
3	Dedicated Lands	8,005
4	Resident Land	2,143
5	Unused Land	143,360

Table 2. Area planted to food crops in Bac Kan Province (2001)

No.	Major Crops	Areas (hectares)
1	Spring rice	5,937
2	Summer rice	12,497
3	Corn	10,188
4	Sweet potato	443
5	Cassava	2,569

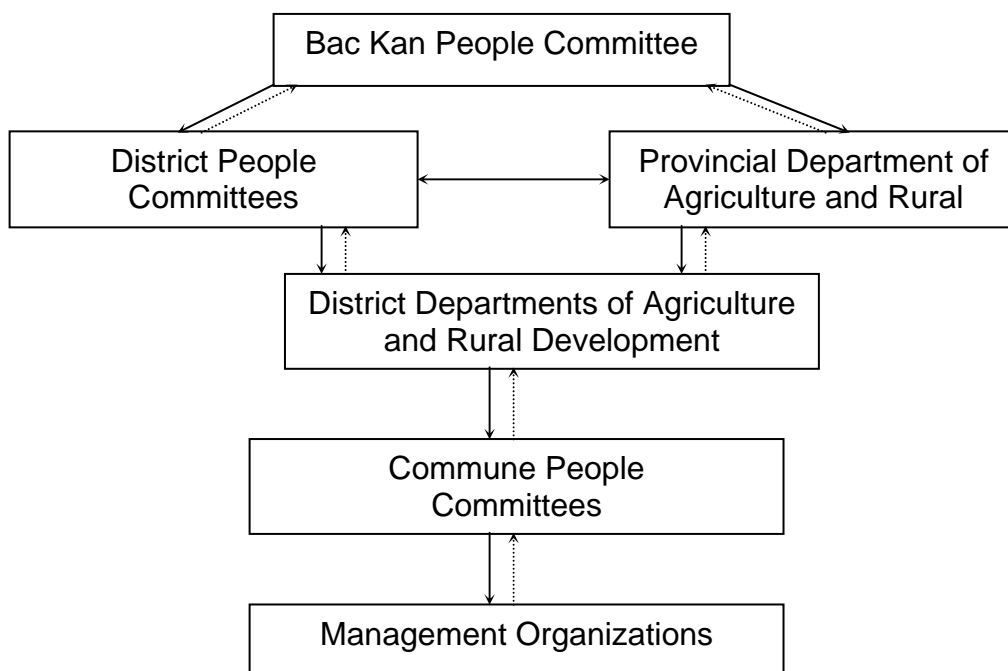
The province's highly variable topography has constrained the socioeconomic development of the area. The highest point is 1640 m in the Khieu Thuong Mountains while the lowest point is 40 m in Cho Moi District. Because of the rough topography, the number of rivers and streams in the province is high although most of them are short rivers with steep slopes and small catchment areas. The province's population is around 285,000 with 10 different ethnic groups living in 122 communes. Of the total population, around 83% depended on agricultural production. In 2002, the total income per capita was equivalent to only 265 kilograms of rice (less than \$100 per year).

Project Accomplishments and Lessons Learned

- A survey conducted by the project showed that there are 2,243 irrigation and drainage schemes in the province, most of which were very small schemes serving an area ranging from a few hectares to tens of hectares of agriculture land. Previously, there were only 165 schemes with solid construction while the rest were temporary structures that needed maintenance after every flood. The area covered by existing irrigation systems is less than 5,000 hectares. In the past few years, with investments from the government and some international donors, nearly 150 irrigation schemes had been upgraded, increasing the irrigation service area by more than 25 percent

- Water management in Bac Kan Province follows the structure shown in Figure 1. The Province, District and Commune People Committees are the local government administrators at the Province, District, and Commune levels, respectively. The tasks of the Provincial Department of Agriculture and Rural Development with regard to water resources, are: (1) planning water resources development and management in the province; (2) appraisal of designs of water resources utilization facilities; (3) drafting regulations and provincial policies on water resources; and (4) guiding and monitoring the implementation of policies and regulations. On the other hand, the District Department of Agriculture and Rural Development has the following tasks related to water resources: (1) implementing policies and regulations; (2) planning water resources development and management within the district, and implementing the plans; and (3) monitoring the management of water resources at the communes in the district. At each Commune People Committee, an official was in charge of water resources development and management, overseeing the operation and management of irrigation schemes and other water resources facilities. This official also monitors the activities of irrigation management organizations within the commune.

Figure 1. Structure of water management in Bac Kan Province, Vietnam



- Participatory management of water resources in agriculture has been promoted in Bac Kan Province since late 1990s. In a number of localities such as Bach Thong, Cho Moi and Cho Don, Water Users Associations (WUAs) have been established as a response to the water shortage problems. Under the framework of these organizations, local people could actively participate in the planning, implementation and management of their water resources projects. This has changed local perceptions, as farmers previously believed that irrigation systems belonged to the government and the task of managing these systems is the responsibility of the government. They soon understood that the irrigation systems belonged to them, that the said systems were constructed to benefit all farmers and stakeholders, and that it is the farmers and irrigators who should be responsible for

managing the systems. Farmers have thus since actively contributed labor and finance for the maintenance and management of irrigation systems.

- Consequently, irrigation infrastructures in the area are relatively well protected and managed, and water situation with regard to water for agricultural production, domestic use and environmental sanitation is gradually improving. As a result of improved irrigation, for instance, crop production has increased from 80,000 ton/year to 110,000 ton/year.
- A case study of Nguyen Phuc Commune in Bac Kan was completed to learn local knowledge and practices in water management. Nguyen Phuc, a high mountainous commune of Bach Thong District, has an area of 4,716 hectares but with only 88 hectares planted to paddy rice. The total population of the commune is 1,917 including 5 ethnic groups (Tay, Kinh Hoa, Dao and Nung). Most of the income of the population are from agricultural production with the income per capita is equivalent to around 390 kilograms (less than \$150) of rice per year. The main crops grown in the commune are spring rice, summer rice, corn, watermelon, soybean and a few other vegetables.

The commune has 35 irrigation schemes most of which are temporary, i.e., with temporary headwork and earthen canals. Only six irrigation schemes had solid headwork with some lined canals (Table 3).

Table 3. Irrigation schemes with solid headwork

No.	Scheme	Service area (hectares)	Number of households benefitted
1	Na Muong	7	17
2	Na Rao 1	12	30
3	Na Rao 2	2.4	16
4	Na Buoc	1.2	10
5	Pac Thien	9	20
6	Thon Ngan	1.2	7

In the 1990s, there was no organization or group responsible for managing the irrigation schemes. Individual farmers had to individually operate the schemes to irrigate their own farms. As a result, crops did not get enough water in time thereby leading to low productivity, labor consumption for irrigation were high, and conflict between farmers were common. The canals were also degraded rapidly because of little or no maintenance.

In late 1990s, the commune adopted the participatory approach for irrigation management. An irrigation management consultant team invited by the commune, met with all the commune officials and organized a consultation meeting participated in by farmers, commune officials and the consultant. The consultation enabled farmers to discuss the need for improved irrigation management and more importantly, identify their possible roles in this task. Farmers agreed that there was a need for an organization, such as a water users association (WUA), to operate and manage each irrigation scheme. The

organizational structure of the WUAs was likewise agreed, with commune officials expressing their willingness to support the organizations. Plenary meetings were then organized for each of four main irrigation schemes to establish WUAs. Farmers discussed and voted on the Statute, Regulation and Rule of the WUAs, and the Management Boards and the irrigation operators were also elected. The irrigation operator's main tasks are delivering water to each farm, repairing the small failures of irrigation scheme and protecting the irrigation facilities. Members of WUA's Management Boards and irrigation operators were trained on irrigation and financial management. At the start of each cropping season, the WUA's Management Board develops the plan of activities and gets approval from farmers during a general assembly meeting. Monthly meetings were likewise held between the Management Board and the irrigation operators to discuss the work completed in the previous month and the water delivery plan for the next month. Water delivery plans are developed based on the water demand and water availability at the headwork.

As a result of WUA's establishment, irrigation improved tremendously. Water losses were considerably reduced, and irrigation structures were better maintained. This led to increases in irrigated area by 15%, and improvement in crop productivity by 20%. Because water delivery was carried out by the irrigation operators, farmers no longer needed to take water to their farms themselves thereby providing them an opportunity to engage in other income-generating activities, and gradually improving their livelihood and socioeconomic condition.

Lessons and New Knowledge from the Project

- The project documented the actual benefits and contributions of participatory management in irrigation schemes in Bac Kan. Local officials are likewise gradually recognizing the value and importance of harnessing local support and cooperation in managing water resources, towards addressing the needs of farmers (i.e., improved crop production) and the administrators (i.e., accomplishment of targets including higher production and income of local residents).
- Simple consultation activities already contribute to local empowerment, with local stakeholders' concerns increasingly being incorporated in government plans and decisions at various levels.
- Government support to community-initiated programs is crucial towards increasing its sustainability and further drawing community members into the programs. The active participation of local government administrators likewise allows the gradual incorporation of the program's learnings into government policies and decisions.

Next Steps

- Strengthen interaction between stakeholders and local governments through conduct of regular dialogues on water management issues towards developing joint action initiatives to address such issues
- Conduct local level capacity building activities for water management