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Effectiveness and Impacts of Communal Irrigation Projects in Agriculture

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Abstract

The Communal Irrigation project is a breakthrough in modern farming with less agricultural operations. It provides sufficient harvest regardless of the season, for the project provides amount of water for the crops. Families benefiting by the irrigation system improve lives through abundant harvest of crops, thereby improving the Philippine economy as a whole. This paper aims to evaluate the significant effect of irrigation system in San Miguel, Pampanga and personally investigate the primary problem in agriculture

Keywords: *Agriculture, irrigation engineering, irrigation project, water supply*

1. Introduction

San Miguel Communal Irrigation Project is located in San Miguel, Pampanga. The primary purpose of this project is to sustain the needs of about 270 hectares irrigational land. Most of the people on the area are farmers and depending only on their source of incomes. It is newly constructed irrigation project in order to give assistance to all farmers on the said province.

During the previous wet season, the farmers are only using the existing brush dam to maintain the needs of these crops, but it is also great big cut for farmers' budget because the money that they use for the maintenance of brush dam is coming from their incomes. During dry season, the farmers in the area use deep wells to irrigate their farmlands due to scarcity of water supply and by increasing the operation and maintenance cost. In order to get a bountiful harvest and adherence to modern farming with less agricultural expenses is by installation of deep wells for irrigation and by the use of diesel as fuel.

The project involves the construction of a check gate along Quitangil River, which is the main water source, construction of additional lined canal, canal structure and other related irrigation facilities. This newly constructed irrigation project is the answer to the needs of many farmer\s in Magalang, Pampanga in terms of water demands. They don't need to install deep well and spend their money to maintain the existing brush dam. Many farmers are now busy in their farmlands for their crops.

Considering budget for the said project, the government of Pampanga allocated big percentage of their CDF is to construct Communal Irrigation Project plus the assistance coming from different government institution concerning on irrigation system. Pampanga is still suffering from natural disasters. However, this is a good example to all farmers to be untied and do their way for their sources.

But now, they are all benefited by newly constructed irrigation project and they are expecting good harvest. The farmer in the area organized an Irrigator's Association. Majority of them are willing to comply with the policies of the administration including the replacement scheme and equity contribution to realize their request.

This research will evaluate the effectiveness and impact of irrigation system in san Miguel, Pampanga and personally investigate the primary problem in agriculture.

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2. Communal Development Irrigation Project (CIDP)

In the late 90's, National Irrigation Authority (NIA) completed the supervision of CIDP 1, they began preparing the second communal loan shown in Figure 1. As they considered how much the new loan might build on the old, who had ultimately resulted in the irrigation of about 50,000 hectares, they had much to review.

They wanted to be sure the bank continued its long-term program approach to support NIA and that lessons learned from one operation could be built into the next one. During their presentation missions, NIA set up a series of meetings with selected Irrigation Association (IA) s to conduct comprehensive discussions of the experiences to date. A number of these meetings were in the Northern Luzon Region and the number of IAs had almost doubled.

During the course of these meetings, they developed an understanding of two major sets of needs. The first set had to do with record keeping about the projects and their impact. The second had to with the opportunities created by the greater availability of water.

2.1. Record Keeping

Nevertheless, as the communal systems expanded, both the IAs and NIA needed more systematic accounting and national reporting. They also needed to improve their tracking of water distribution, cropping, rainfall, flow statistics, operations and maintenance, crop performance and agricultural incomes.

In CIDP 2, they agreed to support the further development of performance monitoring and training at all levels. The training programs helped the associations develop needed skills in decision making, resource mobilization, conflict resolution, and performance monitoring.

2.2. More Sophisticated Needs

The improved irrigation services at the communal level and the greater availability of water have led to a higher and more varied set of agricultural needs {1,2}. During preparation of CIDP 2, the bank team attended a series of meetings organized by NIA with the farmers' needs and desires. In some areas, the more successful IAs had already developed their own solutions, investing in threshing floors, bulk procurement, storage-facilities, and marketing and providing credit to other group of farmers,

Figure 1. Communal Development Irrigation Project

This stimulated the less successful IAs to do the same and more. Some of the farmers thought they needed to form cooperatives to get group credit, crop insurance,

and marketing services and to build drying floors. In the interview with the farmers, they said that "we have the water, we have enough food for ourselves, and we can ready improve our incomes now if we get the right kind of assistance." They wanted better weed control in the canals and paddy lands. They wanted to diversify their crops, particularly in the dry season. They wanted to understand more about fertilizers and pest management and to produce seed, fertilizers and agrochemicals.

Both NIA and the farmers said that they were committed to meet these needs through participatory process. For these purposes, NIA devised a novel grassroots approach. For all communal irrigation systems rehabilitated or established under CIDP 2, NIA collaborated with the IAs to prepare and implement agricultural development plans [3]. These plans cover most of the needs raised by the farmers, including cropping patterns, equitable water distribution in the case of shortages, reforestation, soil and water conversation, nurseries, and other support services. They also include farmer training, extension visits, demonstration programs for crop production methodologies and pest management and mechanization, as well as cooperatives and other means for bringing greater credit and marketing schemes to each IA.

2.3. Supervision

Things are going fairly smoothly in spite of financial difficulties that have slowed the pace of implementation. Supervision missions about twice a year for CIDP 2 appear to be adequate, particularly because they make a point each time of visiting the farming communities. Their review indicates a substantial increase in average family incomes. The IAs tells that their improved records on water allocation and cropping are helping to ensure a more equitable distribution of water and to ease the resolution of disputes.

To participate with NIA in the implementation of the Agricultural Development Plans, each IA has formed an Agricultural Production Subcommittee. The subcommittees meet often, after obtaining suggestions and complaints from the IA members, to arrange water scheduling, review accomplishments to date, establish annual objectives for the next stage of implementation, and provide input into the annual work plans of the community organizers and extension workers.

3. The Bank's Role

The Bank has been lending to a relatively successful agency that was client-oriented and supported participation. This as due, in part, to the support NIA received from the Ford Foundation and from other aid organization. The Bank team as well as NIA benefited from the experience and expertise of these organizations. The contribution over time could be described as follows:

3.1. Flexibility

It proved unrealistic to try to predict rigidly the time needed to develop the associations and ensure their ability to participate [4.5]. Also, targets that were too rigid tended to determine the farmers authority over the systems and, in turn, their commitment. In CIDP 2, the desired flexibility was achieved by committing to work programs only one year at a time. Each year's work program took into account the performance of the preceding year.

3.2. Coordinating between NIA and other Agencies

Although other government agencies were charged with providing the necessary support services, they seldom functioned in a coordinated manner. To a great extent,

the Bank team provided a liaison function. For example, NIA had trouble getting the budgetary agency to release funds appropriated for NIA, and the IAs had trouble getting credits in a timely manner from the Land Bank. The Land bank was able to facilitate timely action by these agencies.

3.3. Applying appropriate Technology

Sometimes traditional engineering approaches lead to work that is not the most appropriate to the situation [6.7,11]. So, in the communal, the users supported NIA in using the simplest technique possible. For instance, the users encouraged adopting drainage crossings, using check gates and spillways where appropriate instead of siphons and diversion weirs, through many efforts such as these, the users were able to reduce costs and limit the need for higher levels of skill and supervision. Most important, because these systems were sample, the farmers could understand and manage them.

Table 1. Field Water Requirement (FWR) and Net Field Requirement (NFR)

Month	FWR (mm)	NFR (mm)
January	218.36	215.46
February	197.21	192.71
March	17.05	30.35
April	0	47.20
May	25.96	49.84
June	241.27	94.47
July	201.68	28.82
August	174.91	43.79
September	150.00	10.50
October	31.14	167.56
November	219.90	168.70
December	208.92	197.42

3.4. Helping Resolve Problems

This was an important area for the bank. For example, a private firm was discharging effluent into one of the irrigation systems. The researcher asked the President of the firm if something could be done. After a lot of resistance, he finally said “Well, I don’t have an idea, but I don’t think you will accept.” As a matter of fact the users though his idea was pretty clever and agreed to it. So he constructed a series of ponds, ran the effluent through them and relied on the natural anaerobic action to render them harmless. This worked satisfactory. When the researcher went back a few months later, the last pond had fish and frogs and aquatic vegetation, and a goat was drinking from it.

3.5. Preserving NIA’s Autonomy

In another instance, someone wanted to turn NIA into a regular line agency receiving most of its revenues from government coffers. This step would have potentially destroyed the linkage between NIA’s services and its revenues, which

helped keep NIA oriented toward meeting the farmers, need [8.12]. The researcher can say that the Bank team single-handedly prevented this move, but it would influence helped.

Table 2. Water Supply and Actual Diversion Requirement (Dra)

Month	Water Supply (mcm)	Dra (mm)
January	0,5514	0.345
February	0.4514	0.308
March	0.4247	-
April	0.3485	-
May	0.8286	-
June	1.0645	0.593
July	2.1442	0.066
August	2.4517	-
September	1.4383	0.066
October	1.1273	-
November	1.3512	0.270
December	0.7972	0.316

4. Results and Discussions

Farmers' participation in irrigation seems to have paid off [9.10]. Tables 1 and 2 show that participatory system where the production yields averages more than 3 tons per hectare in both wet and dry seasons, whereas in non-participatory systems yields were a little more than 2.5 tons per hectare. In the dry season, the participatory systems expanded their irrigated area by 35 percent (35%), whereas the non-participatory systems expanded by only 18 percent (18%).

The farmers' degree of satisfaction with the resulting canals and structures and differed between participatory and non-participatory projects. In the non-participatory systems, farmers abandoned 18 percent (18%) of the canals constructed with the NIA assistance and judged an additional percent (20%) of the new structures to be defective. In contrast, in the participatory systems, only 9 percent (9%) of the canals were abandoned and 13 percent (13%) seen as defective.

One of the ways farmers were required to contribute to the costs of construction was though equity labor, materials and land. They were required to contribute 10 percent (10%) of the construction costs or 300 per hectare. The non-participatory systems fell short, raising only 54 per hectare, whereas NIA's participatory systems generated 357 per hectare on average, thereby exceeding the minimum. This represents an immediate 60 percent (60%) recovery costs for the institutional development activities related to participation.

With regard to organizational structure, irrigation associations developed through participatory approaches were found to be more rooted in the communities, Organizational leadership in participatory systems include more tenants and small farmers, whereas in the non-participatory systems , the leaders tended to be wealthier. These differences indicated that in participatory IAs, the socioeconomic status of the leadership

was closer to that of ordinary members than was the case for non-participatory IAs. This may have contributed to the more equitable water distribution noted below.

With regard to equitable water distribution among members during times of scarcity, the participatory systems were more likely to (a) rotate water according to schedule, (b) allow each group in turn to make use of all available water for an allotted period of time, and (c) employ personnel to supervise water distribution to ensure equity.

Significant differences were also discovered between participatory and non-participatory systems when it came to the financial practices of associations. Up to 50 percent (50%) of participatory systems employed practices such as conducting annual audits of their accounts, preparing financial statements, using vouchers for expenditures and monitoring payments on each member's card. Less than one-fifth (1/5) of non-participatory systems are engaged in such practices.

5. Summary of Findings

This study was conducted to evaluate the effectiveness and impacts of Communal Irrigation Projects in Agriculture of San Miguel Pampanga. It is very useful and economical to all farmers in the area. The newly constructed irrigation gives more sufficient amount of water that their farms needs. They don't need now to worry even in times of doughtiness or during rainy seasons. The NIA allocated their budget to realize the assistance from the government institution directly to the farmers of this province. NIA personnel are personally supervising the construction of this project to ensure the good quality of irrigation and to fill the necessities of their farmlands.

Although the farmers and the NIA officials are working together to modernize their equipments and facilities, they have still an argument in terms of payment. Many farmers are against the 80% of their harvest as equity, plus the 1.5% cavans every harvest time. Farmers are willing to pay them by working the construction irrigation projects for free, but not in cash.

6. Conclusions

After thorough analysis of data gathered and investigation of San Miguel Communal Irrigation Project in Pampanga, the researcher concludes the following:

They formed an Irrrigators Associations to lead in all projects and activities of the farmers. Though not all farmers joined the association, there are some of them are willing to abide in NIAS's policies.

Previously, they only used an improvised enclosure for intake of brush dams 1, 2 so as not over flow.

The Communal Irrigation Project primary significance is to get a sufficient amount of water for their plants even during dry season.

The NIA policies for the terms of payments are (a) that the farmers must pay the NIA 10% to 30% equity fee per hectare and, (b) They must pay 1.5% cavans of rice per hectare every harvest time. Many farmers opposed to these payments schemes instead they would pay it by working in the construction of communal project for free.

The farmers were divided into two groups, the participatory and the non-participatory. Participatory is composed of small farmers and tenants, they were the ones who comply in the requirements of NIA while the non-participatory is composed by wealthier group and opposed to comply with the requirements.

This project shows that the Philippines can compete to other farmland abroad regarding the modernization of facilities and equipments in farming industries. Communal Irrigation Project is not 100% finished in construction, but it already serves the agriculture of the farmers. The IA's was asking to finish this project to the NIA personnel, to be more

convenient. Some parts of the project did not work well or substandard likewise; the flooring of distribution canal is only 3 inches thick instead of 4 inches standard according to the National Structural Code of the Philippines (NSCP). Lack of artillery canal going to each farm, overpricing of materials for construction, sub-standard of construction materials, they use improvised closure for the inlets of Quitangil River during rainy season and the 30% equity of their harvest was charged by NIA.

All sets of recommendations and sharing of ideas of the researcher has come up with the conclusion that Communal Irrigation project is very useful but the construction of the project is too much expensive that the actual allocation budget prepared by the National Government unit.

Appendix

Figure 1. Infrastructure Project to Irrigate 124 Hectares of Land

Figure 2. Irrigation Water Delivered in the Farm

Figure 3. Communal Irrigation Project

Figure 4. Ground Works of the 17M php Dam of Communal Irrigation System

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