WATER CONSERVATION FOR THE SMALL FARMER IN THE PHILIPPINES

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ABSTRACT:

Establishment of Small Community Center to demonstrate the practicality of a sustainable integrated farming system using intense cropping, precision irrigation and water recycling.

Use small site typical of the amount of land owned by Land Reform Beneficiaries to explore irrigation methods that will conserve water, decrease dependence on external energy sources, and decrease salinity in both soil and groundwater. This would allow farmers to evaluate the benefit of different farming and irrigation systems without risking their crop

Intense farming and precision irrigation combine to permit more effective utilization of land and water resources. We hope to expand opportunities for women to generate an income from home such that they do not have to work in the sugar cane fields.

BACKGROUND:

While the Comprehensive Agricultural Reform Program (CARP) implemented in the Philippines may strike many as an admirable program, it is failing to reach the objective of providing the small farmer with a sustainable livelihood.

As some of the larger land holdings have been broken into 1.5 to 2 hectare parcels, the economies of scale have been lost, and once productive lands for rice and sugar have been converted into marginally productive smallholdings.

While the farmers now own the land they till, many do not have the basic skills to operate the various aspects of their farm. Typical would be the sugar cane worker whose job was harvesting. During the growing season he would be out of work, and only able to do some casual labor as the job market would permit. He would not have the knowledge to produce sugar cane from start to market. His job specialty was harvesting.

In addition, he would not have access to production credit that would allow him to purchase the necessary inputs such as cane points, fertilizer, insecticide and herbicide. This scenario is repeated with the rice farmers who have been “beneficiaries” of the Agricultural Reform Program.

Some of the beneficiaries have resorted to seeking loans from loan sharks who charge usurious interest rates that would be intolerable in the developed world. (The system is called 5/6, whereby the borrower pays 6 pesos back for 5 borrowed – monthly rate of 17%). The debt burden almost insures the farmer’s failure. Other farmers contract their land out for raising game fowl or other non-crop related enterprises.

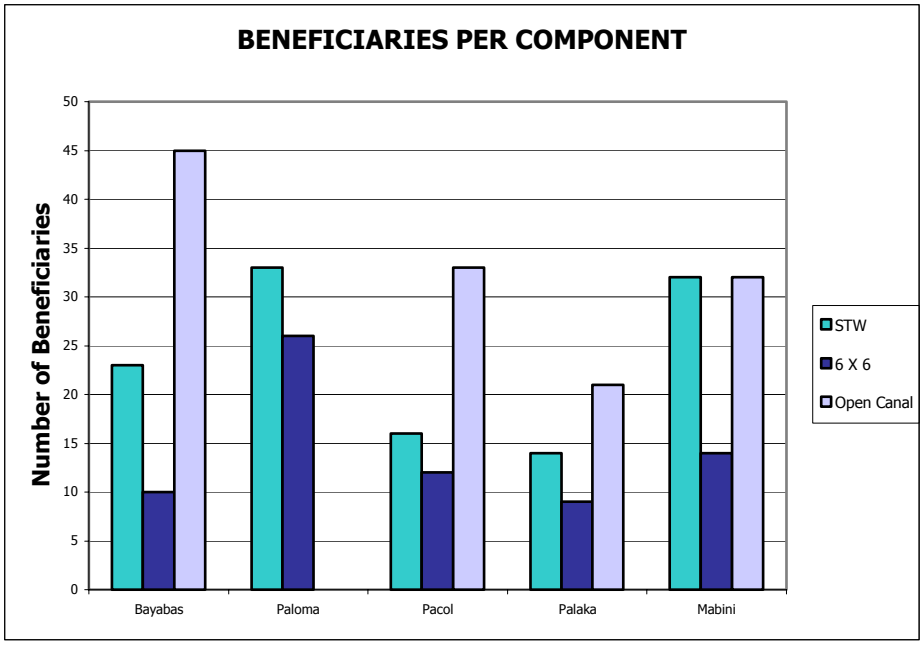
Typically the small farmer does not have the influence with the Irrigation System managers to ensure adequate water supply during the dry months (December-May). The National Irrigation Administration (NIA) has its own problems and as one proceeds down the irrigation canal the problems become more evident as the dry season progresses. During the dry season, loss due to drought is the highest contributor to crop loss. Other factors include pests and wind damage (Department of Agriculture 2002).

IRRIGATION AND SMALL FARM DEVELOPMENT PROJECT:

With major funding provided by the Rotary Foundation of Rotary International, we have worked with a group of small farmers in 5 villages located in the Municipality of Valladolid, Negros Occidental, Philippines. The typical farmer is planting lowland varieties of rice and generates two crop cycles during the wet season. Many plant vegetables during the dry season. The overall goal of the project was to assist in establishing irrigation sub-systems to supplement the government program and to provide pre and post harvest assistance in the form of working animals, power tillers and threshers. In addition, we provided credit for production or enterprise development.

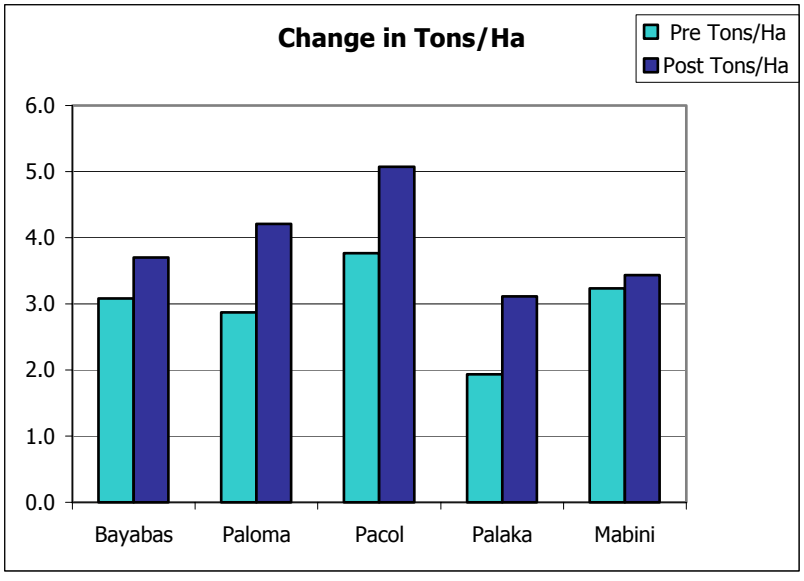
The irrigation component is comprised of 10 shallow tube wells with 4-inch pumps powered by 8 hp diesel engines and 5 small check dams to impound water that is pumped by 6-inch pumps powered by 14 hp diesel engines. In addition 9 km of open canals were rehabilitated or constructed.

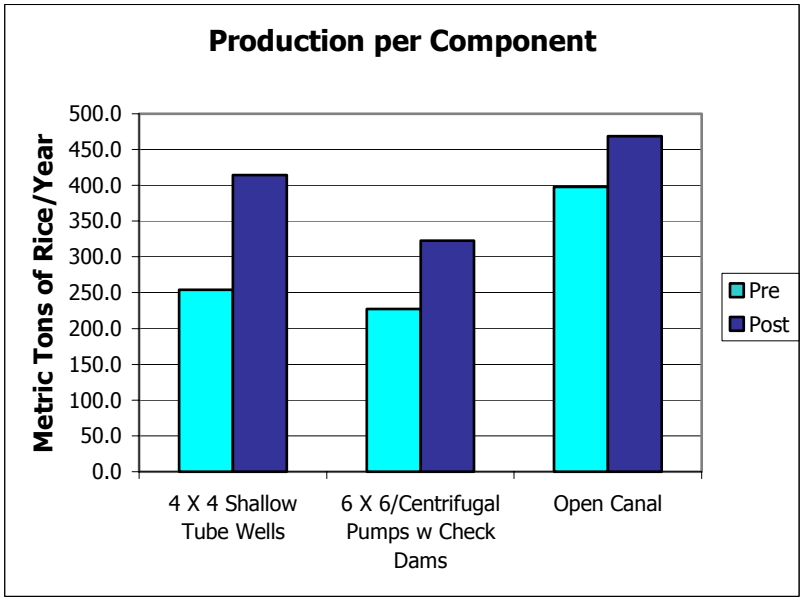
The overall increase in production among the 5 villages was 37%. This was the result of either increased land area farmed due to the irrigation or increased production per hectare as a result of water availability.



- Barangay Paloma did not construct new open canals, but did refurbish 1500 meters of distribution canal that served the 6" centrifugal pumpset

Three hundred eight irrigation beneficiaries were able to increase production by 37%. We do not have the data to establish a control group to determine the significance of the production increase. In the Western Visayas, however, the metric tons per hectare rose by .03 tons/ha to 2.71 t/ha, while our beneficiaries noted an average of 1.0 t/ha increase to 4.1 t/ha for the same period.





* The Shallow Tube Wells gave an overall 63% increase in production and 52% increase in yield/ha
  The Centrifugal Pumps gave an overall 42% increase in production and 30% increase in yield/ha
  The Open Canals gave an overall 18% increase in production and 12% increase in yield/ha

SMALL FARM RESOURCE DEVELOPMENT CENTER:

It was felt that perhaps a different approach to sustainable irrigation would be through a small experimental farm. With funds donated by friends and family, we leased some land near the municipality of Talisay, and have started a small demo farm to evaluate different methods of irrigation and cropping on our own land so we do not endanger the livelihood of the farmer.

We installed a hydraulic ram pump in a small nearby creek and now have the ability pump water twenty- two meters up into two holding tanks. One is a 17,000 liter ferrocement tank, and the other is an elevated plastic drum with a capacity of 1,000 liters. We plan to raise tilapia in the ferrocement tank and use the surplus water for irrigation. The plastic tank feeds drip tape for vegetables and other value added crops.

During the summer months when the small creek that feeds the ram pump is dry, we are able to use buckets suspended on bamboo "Ts" to feed the drip tape. We can supply 200 plants per bucket using 5/8" drip tape w/12" spacing.

SYSTEM OF RICE INTENSIFICATION (SRI):

We currently have about 1,000 sq. meters of rice planted using the System of Rice Intensification (SRI) model developed in Madagascar. SRI is composed of five recommended practices:

1. Early transplanting (8 days opposed to 20-25 day)
2. Plant single seedlings (opposed to 3-4 per hill)
3. Wide spacing (30 cm opposed to 15-20 cm)
4. Intermittent irrigation and good water control (opposed to constant flooding)
5. Frequent weeding (opposed to herbicides)

The SRI is gaining some popular support in the Philippines and there are currently trials underway with Broad Initiatives for Negros Development (BIND), the Consortium for Development for Mindanao Cooperatives (CDSMC) and the Philippine Rural Reconstruction Movement (PRRM) among others.

Preliminary results are encouraging, and in a comparative study between SRI and Non-SRI methods yields of 5.1 t/ha using SRI methods opposed to 3.1 t/ha using conventional techniques were obtained. Other Non-comparative studies between November 2000 and March 2001 have yielded averages of 6.9 t/ha (Gasparilla 2002).

Typical rice farmers are oftentimes reluctant to attempt novel methods of production for fear of losing a crop, or experiencing decreased production. Their existence lies in the fragile balance between natural and man made calamities.

One can understand their concern when they are told to plant 4 kg/ha of seeds in the seedbed instead of 40 kg. Additionally, transplanting takes place at a very early age, 7-8 days instead of the routine 20-25 days. The single seedlings look fragile, and at one seedling per hill instead of 3-4 seedlings, the farmer has more reason for concern.

Wide spacing between seedlings also contributes to the farmer's reluctance to adopt this method. Typically the seedlings are planted at 15-20 cm apart, whereas SRI spacing is wider at 25 to 50 cm apart. Gasparilla's study shows the 33 cm spacing to provide the best average production.

In Madagascar, where the system was initially developed, researchers are finding a large number of farmers abandon the system in spite of the yields obtained using SRI. The average number of farmers who tried the system and then abandoned it was 40%. It was also found that those continuing to use the system rarely planted more than half their land to the SRI. It was thought that the need to hire themselves out for income during the planting season caused many to drop the system (Moser and Barrett, 2002).

Many people are of the belief that rice requires continual flooding in order to develop. However, constant flooding decreases the amount of oxygen to the roots, and may hinder development of the plant. The SRI method involves intermittent flooding during the vegetative growth phase and 1 – 2 cm of water after panicle formation and during the ripening stage as opposed to the traditional 5 cm.

The Philippine Dept of Agriculture figures that it requires one cubic meter of water to produce .5 kg of rice. Using that figure, we can calculate the theoretical water usage for the rice grown in the 300 ha irrigation and small farm development project for the 2002-03 cropping season, we come up with 2.4 million cu. meters of water used. To put that figure into perspective, that would be around one square mile of water 3 feet deep. Some of the claims for SRI are that the system uses about 50% of the normal water requirements (Vallois 1997), so the water saving alone would be significant.

As with any new system, it takes time for people to adopt and change their habits. Skeptics are plentiful and it takes a determined farmer to go against tried and proven methods of production. Due to the increased labor demands of the Rice Intensification System, it might prove more palatable if farmers adopted a small section of the farm for family consumption. In this way, they would be able to compare yields with the traditional system, and possibly have some more land available for high value crops such as fruits and vegetables.

We plan to develop some integrated practices on the Demo Farm wherein we reduce waste and recycle water using the fish pond, vegetables, rice paddies and taro grown in the drainage channels. We also hope to develop an alternate source of cooking fuel in an effort to decrease the dependence on charcoal. This will save the trees that are currently being harvested to produce the charcoal as well as decrease the amount of air pollution that results from the processing operation.

We hope to develop local markets for products produced on the farm as well as offer training seminars and on farm consultations for those farmers interested in the system. There are also several large producers who are interested in incorporating drip irrigation into their operations to permit intercropping fruit trees with vegetables.

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