The Role of People Organization in Water Resource Development at Village level

*Dr. Pirom Chantaworn**

I. Introduction

This paper reports on some of the activities related to the Thammasat University-University of British Columbia action research project People's Participation in Rural Development that was carried out in Northeast Thailand from 1988 to 1992. The Northeast team worked in Tambon Muang Tao, located in the Payakaphum Pisai District of Mahasarakam Province.

The Tambon, or rural sub-district, Council is engaged in two related but nevertheless distinct activities: the first is to cope with self determined community concerns, the second is to carry out activities assigned to it by various government authorities. The latter include, community data collection, preparation of the Tambon's annual and five year plans for public works, collection of the land tax, and provision of voluntary assistance to carry out a variety of government initiatives that change with the circumstances.

Community concerns characteristically include: public works such as roads and water resource development for farming and domestic consumption; the impact of price policies for farm inputs and outputs; new technigues to improve farm practices and productivity; and the search for security and social harmony.

Some of the tasks assigned by government authorities particularly in water resource development have been in conflict with those initiated by the community, creating dissatisfaction and mistrust between the community and the government.

The action research project in Tambon Muang Tao, placed three research assistants in the community. They completed diverse exercises working with the Tambon Council to identify community problems, and to work with the Council in planning and monitoring various actions to deal with these problems. Working in the interests of the community the researchers tried to understand its social organization, the organization of government at the District level and the relationship between the government and the Tambon. These activities included efforts to improve water resource management and related conflicts.

Based on this experience, and an understanding of the physical conditions, this paper offers a way out of water the resource problems of the Northeast based on small scale community

* Assistant Professor, Faculty of Economies, Thammasat University

water resource management. This alternative brings external intellectual resources to the community through the collaboration and training offered by a small Non Governmental organization interested in advancing appropriate technology for small scale farmers.

II. The problem of water shortage and salinization of ground water

The Northeast region of Thailand is well known for its water shortage and the salinization of ground water. There is evidence that the area used to be the a sea many thousand years ago. This sea had an area of 17 million rai (27,000 sq km, 1 rai = 0.16 hectare, 2.5 rai = 1 acre) surrounded by another 19 million rai of salt marsh for a total of 36 million rai. This is 32% of the total land area of the Northeast region.

The people of this region are amongst the poorest in Thailand. According to a 1986 survey 48% live below the poverty line. The main causes of this situation are the shortage of water and the low productivity of the land. The principal crops are rice and high land products such as corn and cassava. Amongst the six physiographic regions of Thailand the Northeast has the largest land area and population but is nevertheless the poorest.

The people of the Northeast have a low literacy rate, nutrition is inadequate and the infant mortality rate is the highest in Thailand.

The high elevation Northeast plain is called the Weeping Gura. It is a dry area without forests or valuable trees. The land is affected by salinity and has poor fertility. The Gura plain symbolizes the drought and water shortage of the Northeast.

Each year after the growing season, or when the rain comes late, there is a mass exodus of people in search of employment in Bangkok or other more prosperous provinces. This creates new problems particularly in Bangkok which is unable to accommodate this influx and as a result new and larger slums are created each year.

There have been many attempts to counter this migration, such as the Green Issan project and other government and non-government efforts to improve the water resources for the northeast people. So far these efforts have been either ineffective or inadequate.

III. The problem of the agriculture system

Modern agricultural techniques were initiated in the Northeast in the 1950's, a decade before Thailand launched its first national economic plan in 1961. What has been referred to as the green revolution has been both a success and a failure for Thai farmers.

On the positive side mono cropping and production for external markets has been extensive and has created huge incomes. Since the first five year economic development plan was initiated in 1961 modern agricultural practices have become more wide spread, at the same time Thailand's economic growth has increased steadily at a high rate of seven to eight percent per annum.

On the negative side the impact of the green revolution in Thailand has also been severe. The rapid depletion of natural resources such as land and water has been extremely wasteful. The forest has been cut and cleared rapidly for the cultivation of economic crops. Indeed the northeast region has been the most exploited and has virtually no remaining forest.

The denudation of the forest in the Northeast has caused the ecosystem to change. The land that use to be good for cultivation now suffers from lack of water and drought. Poverty amongst the people has become wide spread everywhere in the Northeast villages.

Water management is the central issue for all of rural Thailand, not only for the Northeast. The dependence of large parts of the country on the cultivation of rain-fed crops, especially rice, is obvious, as are the effects on the people of these areas when the rains are early, late or fail to arrive. Added to these natural hazards is the increased salinization of the rivers in the Northeast. This impact is particularly severe when massive extraction of underground rock salt for the glass making industry has occurred, or when domestic salt manufacture results in the drainage of salt water into the rivers.

Another impact of the green revolution has been the increased debt amongst farmers in the Northeast. The cost of the input factors for production, such as fertilizer and insecticide, have increased substantially, while the price of crops has not increased at all, or at a much lower

rate than the input costs. Furthermore it appears that the price of farm products has been controlled and manipulated by the export companies.

The problems that face the villagers of the Northeast who have adopted modern agriculture methods have become complicated and beyond their control. It has brought them into inter-regional and international trade and exchange. One result has been an influx of Northeast people into the cities where they are engaged in low paying jobs. Similarly Thai workers employed abroad, especially in the oil rich countries and Asian NICs, are mostly from the northeast. This is no doubt the result of changes in the agriculture system that have depleted the natural resources and worked against the interests of the people. These circumstances have created an awareness of alternative agricultural practices by both private farmers and the some government officials.

The alternative recognises the problems that have been created for people and the environment by modern agriculture practices and offers other options for the production system in the Northeast, as well as other rural regions of Thailand. The alternative agriculture is not in fact new.

The traditional ways of farming prior to the market system was based small family plots that were used to grow a variety of crops as well as to raise animals such as chicken and fish. The farming techniques required a minimum amount of water yet the system was able to sustain village life as well as protect the ecosystem. These traditional methods are now called integrated agriculture or Kaset Pasom Pasan in Thai.

IV. Integrated agriculture and community development

Agriculture has always been the main human activity of Northeastern Thailand producing crops and animals to satisfy the need for food, medicine, clothes and shelter. The traditional agriculture system was an intrinsic part of village social relations at the level of the family and the community. It was the foundation of artistic expression and human culture. The invention of tools, improvements in production, social development and the quality of life were all derived from the agriculture base.

In the past Thai farmers depended entirely on natural processes and grew many kinds of crops to sustain their life. But this changed after the second world war when the market system and modern agriculture transformed rural Thailand. The new production pattern for Thai agriculture was shaped by mono cropping and required a larger land area to serve the international requirements of the market system.

The policy of promoting economic cropping for export caused the rapid expansion of the cultivated area at the expense of the forest cover. The forest which once covered about 60 percent of Thailand was soon reduced to 50% when national economic development planning was introduced in 1961. Now the area covered by forest is less than 23%. This has had a serious impact on the equilibrium of ecosystem. The drought in the northeast and throughout the country provide evidence of this change.

The high runoff now caused by the regular typhoon in the South has started to destroy agricultural land and has caused the loss of life. This was particularly serious in 1990 and 1991. Almost every year some area is now affected by widespread crop disease or crop damage by insects which may reach epidemic proportions. Furthermore the quality of the soil has deteriorated, increasing the farmer's cost of production by requiring more inputs in terms of fertilizers and chemical insecticides. These in turn are beginning to create severe pollution problems.

The high cost of production, increasing prevalence of natural calamities, and depressed commodity prices means that Thai farmers have to face increasing financial losses and indebted ness. As an outcome of this process more and more farmers have lost their land to the money lenders.

The transformation of rural Thailand over the last three decades, as sketched above, has caused some farmers and intellectuals, to ask whether modern agriculture techniques that require high capital investment and aim to serve the world market is the only option open to rural Thailand.

Integrated farming or Kaset Pasom Pasan takes a different approach which is derived from traditional agriculture procedures. Some of the

traditional precepts are: plant many different kinds of crops and raise animals that support and complement one another. Instead of maximizing income the objective of production is to minimize expenditure in order to maintain self reliance and secure and sustainable development in the long run. The viability of this approach in modern Thailand has been demonstrated by many farmers who have changed their practices on their own initiative.

In case of the Northeast, Mr. Yu Soonthonthai is a an example of a successful and prosperous integrated farmer in Surin Province. He raises rice an fish in the paddy field; ducks and turkeys in his yard; and fruit trees along the small pond in his farm.

Yu started integrated farming after he was a Buddhist monk in Bangkok almost 40 years ago. At that time he observed the interdependence of plants in the fruit orchards of Thonburi which he visited each morning to preach and seek food alms as part of his Buddhist training. When he walked along the small ditches that were planted with fruit trees he said he observed that the fallen leaves provide fertilizer for the soil; that the fishes in the ditches were nourished by the fertility of the soil and rich aquatic environment; and that the fishes also contributed soil fertility that was taken up by the fruit trees. He noted each year that the orchard owner had a bountiful harvest.

Yu was intrigued by this interdependent ecological system that recycled nutrients through several levels. After he disrobed from the monkshood and returned to work as farmer on his father's land he practiced modern farming techniques for a short time but soon adopted integrated farming. He has done so with great success, maintaining a comfortable standard of living that has supported the advanced education of his children.

Another farmer in Buriram province, Kamduong Parsiz became seriously indebted after practicing modern farming techniques. He experienced great unhappiness and very low morale before he decided to turn his back on modern practices and adopt natural farming after reading a story by Fukuoka. Based on his personal observations of the impact of modern practices he has adopted very strict natural farming techniques. His precepts are:

- do not weed, let it grow and become fertilizer when it dies;
- do not plough, because it will destroy useful insects in the soil;
- do not use chemical fertilizer, because it will only benefit plants and soil for a brief time but will be harmful to the soil in the long run;
- do not spray with any insecticides.

Kamduong Parsi's success is well documented. On a small plot of three to four rai he is able to produce 30 bags of rice compared to about 12 bags produced by neighboring farmers using modern techniques.

V. Water Resource Development in Two Northeast Villages

This part of paper is based on field data gathered in two village in Roi Et Province: Nongya Ranka and Kao Kok both situated in Tambon Srabua of Amphoe Patumrat.

Nongya Ranka has population of 135 households or about 675 people while Kao kok has about 750 people in 150 households. The main occupation of both village is rice farming supplemented by wage labour both within and outside the villages.

Data on water resources in two villagers are as the follows;

Table 1 1992 Water resource development for Nongya ranka (135 household)

Source	Developer		NGO
	Government	Village	
a. Big pond	2	> 50	15
b. Artificial well	6	75	80
c. Shallow well	2	-	-
d. Cement jar	110	-	-
e. Rain water tank	7	-	-
f. Village water supply	1	-	-

Table 2 1992 Water resource development for Kao kok (150 households)

Source	Developer		NGO
	Government	Village	
a. Big pond	3	> 50	10
b. Artificial well	3	70	46
c. Shallow well	3	-	-
d. Cement jar	117	20	-
e. Rain water tank	6	-	-
f. Village water supply	-	-	-

a) Big ponds

In general the capacity of the village ponds is less than 2,000 cubic meters. They may be constructed using basic hand tools and manual labor or with the aid of machinery such as tractors and bulldozers. These ponds have several benefits for water storage for human and animal consumption and for *year round irrigation.*

Some plants can be grown on the perimeter of ponds under 500 cubic meters, but larger ponds provide space for the extensive planting of vegetable and fruit trees. The ponds are also suitable for fish rearing for personal consumption and to provide a supplementary source of income. Fish culture and animal raising is most efficient for ponds over 500 cubic meters with a depth of 2.0 - 2.5 meters. This form of water resource development makes integrated farming possible in the Northeast and has been promoted by small NGOs as well as by some government officials.

b) Artificial or shallow wells

Artificial or shallow wells were initiated by the government in the early 1980's with some financial support from overseas aid for the use of modern equipment. However the cost of these wells proved to be rather high at 65,000 to 80,000 bahts per well. As this exceeds what the villagers could afford they organized themselves to acquire simple equipment with some NGO assistance. They found that they could build a well of the same quality at a much lower cost of 2,500 to 3,000 bahts. The equipment used limits the depth to not more than 30 meters.

c) Cement jars and rain water tanks:

The characteristic large capacity red cement jar seen throughout the Northeast is the result of a government project, called the red jar project, which was implemented to provide drinking water for the Northeast villages. These jars have a two cubic meter capacity. The government launched the project in the mid 1980's with the objective that each household should have at least one jar. Their analysis showed that two jars, each with a two cubic meter capacity would be sufficient for drinking and domestic consumption for a family of five persons for one year.

Government support for this program through a revolving fund, administered at the village level, could make it possible for every family in the Northeast to solve the water shortage for domestic purposes even though the family size increased.

Most of the large rain water tanks in the Northeast have been built with the assistance of yet another government project. These are generally used to satisfy the requirements of public schools and temples. It has however been found that because of supply and allocation difficulties such tanks are not satisfactory when built for general village use.

The situation in the Kao Kok village presents some of the problems associated with these tanks. To provide protection against the drought the 1990-92 Suchinda regime allocated 2,000 million baht to cover the cost of these concrete tanks and the trucks required to haul water to them. For Kao Kok three water tanks were placed at the road intersection near the edge of the village. This has proved to be a wasteful expenditure as the trucks can only be used to haul water for two or three months of the year after which time they are idle and the tanks are empty.

d) Village water supply

A piped village water supply system is only useful when the community has an adequate water resource. Such systems are a long run community benefit providing a convenient and economic supply is available. A general problem of these systems has been the poor planning by the responsible government authorities. For example a water supply system is now under construction in Nongya Ranka village despite the fact that almost all the households have their own reasonably satisfactory small artificial wells. This shows misplaced government priorities in face of much more serious water supply problems in other villagers. This supports the view that the problem in the Northeast is how to use limited capital to solve water resource problems which are predominantly a shortage of supply.

VI. Training by NGOs for village level waters resource development

The management of village water resources in the Northeast involves projects undertaken by the government, by the people in the villages, and by NGO's that provide direct assistance as well as training. From the above brief account of the problems in two villages in Roi Et Province it is apparent that government offorts have been inadequate. With the exception of the red jar project most government efforts fail to involve meaningful participation of the people or to generate much enthusiasm. By comparison the NGO experience shows promise towards the development of appropriate technologies to resolve water shortages and improve the management of the resource. One example is the success of the farmers who have developed the integrated technigues discussed above using small ponds and artificial wells. They have produced high yields and a variety of crops to provide bountiful food for their families as well as some that can be sold in local markets.

Whereas people did not previously want to live in these villages, they are now much happier with their situation. Social life of the communities has improved and families are not dispersing.

The Appropriate Technology Association (ATA), is an NGO that is interested in solving rural problem especially in the northeast and northern regions of Thailand through the application of concepts advanced by Schumacher in his influential book Small is Beautiful.

The Association launched a successful new program of village training for water resource management in 1990. The curriculum provides the following basic knowledge in three parts.

Part I

- Introduction to village water resources development
- The characteristics of water, soils, water catchment areas
- Mathematics for water measurement
- Concepts of integrated farming (Kaset Pasom Pasan)

Part II

- Planning techniques for water development
- Basic farming models
- Calculation of water supply and demand derived from the proposed activities
- Decision techniques, simple benefit - cost analysis

Part III

- Field visits to successful integrated farmers
- Technical training using ATA's *manual rigging technique and Rower Pump equipment*
- Methods of people participation

These training techniques have so far been implemented in three villages. The simple down to earth approach provided by ATA has been positively received by the villagers and other NGOs. Knowledge of this success has spread and the training team has been invited to the People Republic of Laos. The curriculum is now being improved and will soon become a regular part of the ATA activities to counter the drought and water shortage in the Northeast.

VII. Conclusions

There is a severe water shortage in the communities of Northeast Thailand due to limited rainfall and poor soil water retention. The situation for farmers is further aggravated by widespread soil salinity. This poor resource endownment has prompted a reconsideration of modern farming techniques that has led to increased indebtedness, deepening poverty, loss of land tenure and ultimately out migration. These changes threaten the rich culture of Issan and with it a well integrated and for many a beautiful village life.

The revival of the old farming techniques that pay more respect to human and ecological systems has rekindled hope among small financially bankrupt farmers. An increasing number are turning to the methods of integrated farming (Kaset Pasom Pasàn) and are achieving success with this system. These practices are returning hope and confidence to the communities of the Northeast.

At the heart of the new systems is the proper management of water resources through small scale projects. Although government has supported some small scale water resource development it is still predisposed to large scale engineering projects. The success of the small scale projects depends on the support of the farmers in the villages aided by external Non-Governmental Organizations, that have provided training and technical advice. These findings support the general hypothesis of the Thammasat-UBC research project on the crucial role of people's participation in rural development that was tested in various settings.

Where the government has implemented small scale projects these have had mixed results. The water jars have clearly proved popular for domestic consumption but do not deal with water for farming as a livelihood. The water tanks have by comparison generally been unsuccessful as the marginal benefit has been less than the marginal cost. Contributing to this failure is the government's predisposition to emphasise inputs, such as the amount of work accomplished, rather than the impact or outcomes on the real needs of the people. *As a result there are examples of recent large scale projects that have remained idle.*

Compared to government projects it appears the those undertaken by the people with NGO support have marginal benefits that exceed marginal costs and appear to be better than the governments small scale projects. The continued success of these small scale water projects requires a more assured sources of finance such as a village revolving fund.

These small scale water resource projects are an integral part of the reintroduction of integrated farming which presents at least some hope towards resolving the long standing economic and social problems of the Northeast that

have their roots in the misuse of the fragile land and water resources. How to involve the people in these decisions through their Tambon Councils was at the heart of the Thammasat University - University of British Columbia action research project.

1. See, Appropriate Technology Association's Video, "Rice land is life."
2. See, National Cultural Office under the office of Prime Minister, "Local intellectual in agriculture."

References

1. Appropriate Technology Association, a Video title "Rice land is life."
2. Appropriate Technology Association, Manual for small water resources development (in Thai)
3. Bishop Paul, Integrated Catchment Management: Managing River Catchment for Sustainability, in a forum for environment sciences, Chulalongkorn University, 1992.
4. Community Development Department, Ministry of Interior, How to do a small water resource project, A Thai-Australia project on water resource development (in Thai) 1990.
5. National Cultural Office in the office of Prime Minister, The Local Intellectual in Agriculture.