



**Promoting Learning Process to produce Organic Vegetables with Special Reference to One Village in a Northeast Thailand**

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**Abstract:**

*Advances in Agricultural Science and use of new technologies resulted into replacing the traditional ways of agriculture focusing on high yield and trade. New farming using chemical fertilizers have many negative effects including environmental degradation, destruction of topsoil, chemical residues in the soil apart from health related problem in the consumers. This research paper focuses on how to promote the collaborative learning process to produce organic vegetables for consumption and distribution. The experimental study is focused in the Ban Don Du, a Northeastern Thai village. The paper elaborates the study, interaction, collaborative processes between several stakeholders to resolve issues in promoting the processes to produce organic vegetables in the village. The paper suggests guidelines for creating the learning process to produce organic vegetables. This research also suggests the Guidelines for creating local organizations for this purpose.*

Keywords: Organic farming, organic vegetables, knowledge management, community farming

**Background**

Modern agriculture is the result of the green revolution that took place during 1960s (Thai year 2503). Using advances in the agricultural science and technology resulted in the increase in production and high yielding agricultural plants and animals. Alternatives to animal labor tillage were developed. The goal of these innovations was to achieve greater productivity in the volume of production and address the changing standards in trade and industry (Anat Tancho, 2550).

New farming systems using agricultural chemicals have had many negative effects. Environmental degradation and destruction of topsoil is another problem, with accumulation

of chemical residues. Economically farmers have higher production costs, a loss in production and a subsequent debt. Manufacturers and consumers are not healthy because of cumulative toxic residues. Illness and diseases such as allergies, stress, and cancer, are common. The number of Thai people affected by cancer is increasing every year. The problems are compounded because farmers rely on agriculture and abandon conventional wisdom in other areas.

Ban Don Du is one of the many communities that have been influenced by in this negative way by modern agriculture. The village has a focus on production for sale, regardless of the impact of toxic chemicals that follows. The community has the main occupation of rain-fed farming, which means they can harvest once a year. They also breed animals and grow vegetables for consumption and sale. Agricultural production with fertilizer and chemicals continue to increase, causing agricultural production yields to decrease every year.

### **The analysis of basic problems and potential of the community**

Ban Don Du is fortunate to have unity. Management in a variety of groups has succeeded and there were various conditions that made it an appropriate area for additional agricultural activities. Water resources and public space for farming were available. Committee and community leaders were planning to use public areas as well. The sale of land as part of a land reclamation contract was planned and implemented, with the digging of a pond for water use and sale of the soil. The villagers grew vegetables for consumption and distribution. The project added the number of households from 78 to 115 households for increased benefit.

### **Recent History of Vegetable Crops (1-2 years ago)**

Don Du Village used chemicals in high amounts because of problems with weeds, diseases, and insects. However, some villagers did not dare to consume the vegetables themselves. Delivery was available to consumers in the market town only (Interview, March 2552). There were too many chemical residues in the soil (100 liters per year), which drowns the natural plants, crabs and fish in the paddy fields. A phenomenal increase of cancer and other diseases occurred. The villagers believed to have been caused by the use of chemicals in agriculture. Chemicals in manufacturing created an impact on the economy, with the cost of production much higher than before.

The community, which has a population of more than 78 wanted to increase household vegetable consumption to reduce household expenditure. The village was interested in producing chemical-free vegetables and to reduce dependency on outside forces. We came together to develop an appropriate approach to the problem. This led to reduction and eventually the end of the use of agricultural chemicals, as well as positive changes in the methods of production of organic vegetables. Active support of the mentoring organizations was important, and in this case this kind of support was from the Center for Non-Formal and Informal Education, the Office of the Community Development, and academics from Maha

Sarakham University.

## **Creation of a research team for study-visits**

Faculty of Information specialists joined the team to help identify the most appropriate forms of communication for the development of learning communities. The expectation was that the research process would create a learning community in which local people would increase their ability to understand and analyze. They would need to have local knowledge of social capital and organic agriculture. This would result in improved health in the community and a reduction in the environmental impact. In addition, local people would be able sell their produce outside the village, increasing revenue.

### **1. Research questions**

how can a process of collaborative learning be implemented in the Don Du Village community so that organic vegetables can be produced for consumption and distribution?

#### **Objective**

1. To learn the context (baseline) of the current and potential vegetable production in Don Du community from past to present.
2. To study ways to create learning that will lead to the production of organic vegetables at Ban Don Du.
3. To study ways to create cooperation networks with partners and support agencies involved in the management of organic vegetables.

#### **Study area**

Ban Don Du is named Moo 9, Canthararath Subdistrict, Kantharawichai District, Maha Sarakham Province. It is located south of Kantharawichai district. Ban Don Du is a medium-sized community with a population of 115 households, comprised of 482 people. Located on rice plains, there is a significant agricultural resource with a total area of 1,231 rai. Pa Kok Jot is a public area (of 87 rai) that local people use to find wild food. Non Nong Lak is a community land that has a public primary school and has a fish pond. The other agricultural area is divided among villagers for vegetables.

#### **Procedures**

##### **Phase 1: Preparation phase and data collection**

1. Meeting for understanding the project objectives and defining the role of the researchers.

2. Meeting to clarify the purpose of the research to participants at Ban Don Du by the representatives from Mahasarakham University, District Community Development officials, District Non-Formal Education Health Agriculture officials, representatives from the Bank of Agriculture and Cooperatives, and the School.

3. Meeting to design survey tools and methods of data collection.

4. Data collection.

4.1 Context of community information.

4.2 Information on how vegetables have been grown from the past to the present.

4.3 Problems and the impact of homegrown vegetables at Du Don.

4.4 Knowledge in the production of organic vegetables both internal and external sources.

5. Set the stage and monitoring data in the area.

6. Meeting Summary.

7. Progress Report.

## **Phase 2: Laboratory testing period**

Preparatory Meeting was implemented, in which the following items were resolved:

1. organized a forum for reducing and stopping the use of chemicals to grow vegetables.

2. Organized the learning process to grow organic vegetables using knowledge exchange process to create a network to learn from the “green market” of Mahasarakham province.

3. Group meeting to prepare a pilot project.

4. Implementation of chemical-free organic vegetable project.

5. Held group meetings to find out how to manage internal and external markets.

6. Held follow-up meetings every 2-3 months.

7. Met to summarize the pilot project.

8. Set stage for collaboration in working with the “Green market.”

9. Set stage for presentation of education and procedures.
10. Summary of lessons learned.
11. Preparation of the final report.

## **Results**

### ***Contextual information about the community***

Ban Don Du has public space and had a plan for clearing, digging, and managing a public pond for agriculture. There was a water group in the village in order to support water management for the community. Currently, the community is able to produce vegetables and sell them at the current average income of 400-800 bhat per week, through a middleman who comes and picks up the produce from the community itself. In addition to this, there is a community forest with access to approximately 46 species of natural plants depending on the season.

### ***Vegetable Production in Ban Don Du in the Past***

The vegetable crops of this community included of those commonly used in the household, and the remainder was sold outside the home. The gardens had sweet basil, chili, galanga, and lemon grass, mostly used in cooking, and was suitable for cooking spicy Isan (local) food. The plants were most often grown around the home and the nearby fields.

Ban Du Community usually collects the vegetable seed varieties themselves and exchanges seeds and stock. The techniques of growing vegetables emphasized consumption. Maintenance and treatment of soil was done using manure from cows and buffalo. Preparation of the fields was done with simple digging and planting, and then the fields were let to become fallow.

### ***Vegetable Production in Ban Don Du in the Present***

Villagers are planting more types of vegetables and fruits than in the past, including papaya because there is enough water. Government policies affected the community's decision to begin to use chemicals to grow more vegetables for higher yields.

### ***Potential for planting vegetables in the past to the present***

Farming in the community has been implemented in accordance with government policies, but on occasions the projects were not sustainable because of changes in agricultural policy or budget. In some cases, the results have been short-term. Vegetable farming has been within the following projects:

In the year 1986 (Thai year 2529), the government launched to promote mulberry for feeding silk worms in the villages. Because silk is in high demand, the villagers raise silkworms and weave silk as a main profession.

Around the year 1987, public land was allocated to local people for community farming. A total of 80 households received the allocation, so the area could be planted in mulberry. They grew vegetables for household consumption only.

In November 1992, there was public support for the community to stop using public land for planting mulberry and to plant grass for cattle feed and for sale instead. Ban Don Du was able to keep up with high market demands because they used chemicals.

Until the Year 2008, the project was funded by SML (SML), the Tambon Administration Organization. The public reservoir was restored in order to address the need for agricultural water. The time after harvest is now used for small-scale vegetable consumption for the household. When there was surplus, it was sold.

Coupled with the public sector effort to promote sufficiency in economy, the restructure of the social communities was done to help them manage their own community resources and has increased participation. Along these lines, the community has set up a working group for managing the agricultural water supply.

### **Potential areas for farming**

Today, the agricultural area is divided into an area of about 63 farm households out of 453.487 acre. The vegetable farm households have an area of 5.090 acre compared to 75 in the past. It is evident also that the farming area in the lower fields for vegetable farming increased to 3.746 acre because of the use of public space utilization.

### **Capabilities in the current situation for the production of vegetables**

here is a total of 61 species of vegetables are grown. Management capabilities are used to find vegetable varieties and to provide for use in the cultivation of vegetables. There are different ways to purchase and exchange plant stock, many of which have not changed from the past. Most households were using 66 species and the remaining 14 homes and a variety cooperative and the use the exchange of vegetable varieties grown up from its former 13 species.

### **Potential capital in knowledge management**

How to grow vegetables that differ little from the past and there are no fixed rules. It depends on the size of the area and the suitability for certain types of vegetables during particular seasons. For example, cabbage is often planted at the end of the rainy season because it yields better than in other seasons.

From the past, the vegetables were consumed and exchanged but now they are grown for distribution. A middleman in the village itself will be taking over. Many agencies assist in providing knowledge about growing vegetables, such as the Non-Formal Education and

Agriculture Sub-District. Those offices organized study visits with representatives of the community but the study visits do not return much to the community due to lack of integration with their actual work. Until the agricultural budget arrives for the district to provide training, there is nothing for the villagers to do.

The community has used various techniques from the agricultural offices from the Provincial Agriculture, Non-Formal Education, and community development sectors. Training on new agricultural techniques was done in November (2551) with 53 households. Training on “How to make fertilizers” was done for 52 households, followed by 30 households that did the organic vegetable training. About one third of the households had self-sufficiency training (about 17 households) and 3 households did not train in anything. In addition, the techniques related to how to use pesticides are as follows:

1. 72 households use fertilizer materials in the community purchased rice husk and dung from outside.
2. 27 households use materials from the waste in the community (such as grass, legumes, vegetables, banana waste and long, green vegetables) to make their own fertilizer and the insect repellent.
3. Insect Repellent was purchased by 25 households from outside the community. For example, they used materials such as cassia leaves and cur cumin as insect repellent and anti-fungal.
4. 4 households use eucalyptus and wood vinegar and neem as insecticides. Wood vinegar makes vegetables beautiful and green.

### **Potential techniques**

The village is prepared to convert to new techniques depending on planting season. During the rainy season, the vegetables need to be lifted 4-5 inches from the ground and set apart by 1 to 1.5 meters. The length depends on the nature of the area and its suitability for farming. Improving soil texture can be accomplished easily, but it depends on the situation.

The holes to be dug for each type of vegetable depend on the type. Sometimes they must be a certain distance apart. For example, pepper will need more space to plant than lettuce and kale.

Shoveling is often done to remove weeds and plant diseases, insects or eggs. There is no certain period of time to do that, but rather if you find that the weeds come up, they should be removed while you are planting.

At Ban Don Du, each household uses their familiar technique for growing vegetables. 40 households use dry manure as soil foundation. 37 more households in the growing season

vegetables prepared for each 10 households. 10 households provided capital to 54 years. 22 households prepared seed. Two households made pesticides on their own.

## **Discussion**

The period of study for the historical information was determined by the major events that occurred in each province. Community groups like the ones there began growing vegetables since the adoption of the public land for community use. Villagers remember this event more easily than trying to think back to a specific date on the calendar. It has been studied as well that villagers tend to remember the details about what they are interested in and what they enjoy (Chai, 2548).

In the past, the rice planting area in Ban Don Du dropped 356 Rai, making a total area of 1503 of crop land. This has lowered to 1147 Rai because of the division of land to the children in the household. In Northeast Thai culture, the wealth of the family in terms of land is often distributed in the form of a dowry. Northeastern people believe that people should have their own land to grow rice because rice is the staple food. Some households have moved to other settlements and sold their land to people outside the community. Finally, the area of Ban Don Du has spread and there was some land reclamation for residential buildings.

## **Guidelines for Creating the Learning Process**

The nature of learning and adult education (Adult learning) is quite different from doing learning project with other populations. In general, the participants in the research do not want to take long time and do not want to spend time in classroom but rather, they learn from looking at the actual location. The principles of adult learning theory are namely 6 (Knowles, 1980; Wech-o-sotsakda, Chanthana, 2008):

- 1) Before you begin to understand what adults need to know, you start by finding problems and learn about their learning needs. For example, community awareness about health might be a problem. You must find solutions and preventive actions that are based on the needs of the community.
- 2) The community must recognize their own responsibility for learning, and this was present for this research group. Community leaders and the research team must agree on the path for solving problems. In our case, there were some conflicts between the research team and some other community members, but after a period of 3-4 months, the conflict was resolved.
- 3) Past experiences helped us. When past experiences were shared, it was possible to learn more and put it into practice. For example, the opportunity to visit the green market came up and from that, community members gained a lot of knowledge and had a positive experience. This inspired the community to try growing and selling organic vegetables.
- 4) Be willing to learn on your own. From a study visit and training for each participant, they



decided that it would be most appropriate for solving their problems if they planted chemical free vegetables.

5) Learning from the problems that arise. The academic research topic itself was not set by the university or researchers but was done by identifying problems resulting from the community.

6) Create incentives for students. It is important to keep in mind the motivation and additional incentives for the research team and participants. By bringing experienced speakers, they were able to share knowledge. This gave the attendees ideas and they could see that they could benefit from learning. This allowed the participants and research teams to work together.

## **The creation of a learning process for the project**

### **1. Bringing outside speakers to teach each other**

The trainers are experienced in growing organic vegetables. In addition, the research team and members of the Green Market have created incentives for the research group. The participants want to take more study visits so that they can learn tips quickly without going to the classroom. They prefer to learn from the actual situation without spending too much time. In addition, when people participate in the process of development, it is more likely that they will be successful at solving their own problems. There is a focus on actively being involved with the public and using the creativity and expertise of the people in order to change the use of appropriate technology and to be able to track and support the performance (Erwin. 1976: 138).

### **2. The study visit**

The participants and research teams who are interested in community actually were able to see organic vegetable production with their own eyes. We undertook a study tour at Ban Nong Kung Tao, Tha Song Khon Muang, and Ban Phu Kosum Phisai, in Mahasarakham Province. The project further motivated the participants and helped them learn about their communities, the condition of the soil, and techniques for growing the vegetables well. They made manure and natural insect repellent from neem seeds. Although there are some people in the training with experience, much of the learning from the training was new.

### **3. Invited speakers helped with training**

There was a demonstration in preparing vegetable plots and making manure. Everyone was very interested in joining. Each person was provided materials to make manure. The community members who participated could exchange goods with each other. Learning from action (Learning by Doing) by participating in this training helped participants to later take action themselves. This is consistent with the theory of Learning from Action activities

derived from interaction with the environment. Also created is an increased knowledge of self.

#### **4. Pilot project in vegetable plots after the training**

The pilot project was done in the months from December to January, so there was a lack of rain. In general, the pilot would have been successful but this time the yield was not good because of the lack of water. The pond water had run dry and the plants were destroyed by insects. However, there are many households and some planted a variety of vegetables, including papaya, a plant that does not need much care. The research team took note of what happened during the pilot project.

After the initial steps and analysis by the research team, we have come to the conclusion that it would be refreshing to bring traditional vegetable varieties that were planted from the past. We found that approximately 10 households changed their way of growing vegetables without using chemicals and are trying to find materials in the community to turn into manure, based on the conceptual model of organic farming of conservation and ecologically sound agriculture. The result was intended to create stability in farming for farmers and restore the agricultural life of the community in other ways as well.

The villagers care deeply about their community. They want to grow a variety of natural vegetables and also wanted the community to reinforce their own identity. In the last meeting, there was a public forum about the observations of the research team and what was proposed in the allocated public area. There was an observation made about the wild grass “Yanang” that occurs naturally and that it could be another vegetable grown organically in the village.

From the ideas from this research work, we have expanded the definition of the adult learning process. A network that we call the “knowledge by action” (Learning by Doing) has the following steps:

1. Knowing the basic needs of the students is the first thing required before students will want to learn something. If it will be beneficial for learning, it should be organized in relation to the actual life of as many people as possible.
2. A stimulus must be created to help with motivation so the scenario is as close to what actually occurs in life. It must be relatively simple.
3. Take the action that is needed, especially for those who cannot read or write fluently. Practice will make students remember better, whether the students sit in class or in lecture.

## **Guidelines for creating a local organization**

Because of this research, it can be seen that the government needs to involve multiple agencies. Some may not be able to participate because of limitations on time, so the process of selection must be done carefully. Therefore, for this research only one area was selected and the work was carried out in unison with Ban Don Du and the Office of Non-Formal Education that serves to support the education and government budget in order achieve sustainable results like the one seen in this pilot project.

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