

# LOCAL KNOWLEDGE ON LAND USE: A CASE STUDY OF MUONG PEOPLE IN NORTHERN VIETNAM

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## ABSTRACT

*This paper discusses the local knowledge of the Muong in Xe II Village in northern Vietnam. The Muong are one of 53 ethnic minority groups in Vietnam. Xe II Village is located in the highlands, far from urban centres. Its inhabitants are mainly subsistence farmers. This paper examines the role of local knowledge in villagers' land-use systems.*

*The paper focuses on local knowledge in wet rice cultivation and animal husbandry. Wet rice cultivation is a long-standing tradition of the Muong people, who have benefited from scientific and technical expertise. However, they have preserved traditional techniques in land preparation and irrigation, with positive effects on soil fertility and protection from soil erosion. Although many villagers use new rice strains, they have carefully selected different rice varieties to suit plots located in different conditions. The villagers continue to use compost and some traditional materials against rice pests and rats, in addition to chemical fertilizer and pesticide. Just as in wet rice cultivation, people have preserved and developed local knowledge concerning animal husbandry. They have flexibly combined rice farming and fish rearing in the same fields. Traditional rules strictly enforced by villagers on the use of natural resources and grazing areas have protected the sources of feed for cattle.*

*The paper concludes that the traditional knowledge of the Muong in Xe II Village has made valuable contributions to community development. The knowledge has been preserved and handed down from generation to generation in families, family clans and villages, through exchanges during farming activities, leisure time, and meetings. The paper also finds that each gender possesses different local knowledge.*

## 1. FOREWORD

Numerous studies have focused on the local knowledge of ethnic minorities. In recent years in Vietnam, local knowledge of ethnic peoples has been studied deeply in many fields, such as management of natural resources, health care, and land ownership. These studies demonstrated the powerful effects of knowledge on people's lives. Knowledge and experiences were accumulated and developed through people's time and living space, thus they take an important role in their social and economic lives. Getting to know positive elements of the local knowledge and promoting them can be helpful for socioeconomic development. However, the role of local indigenous knowledge in the promotion of socioeconomic development has not been adequately studied. This report examines the importance of local knowledge in wet rice cultivation of the Muong ethnic people in Xe II-Van Mieu Commune of Thanh Son District, Phu Tho Province, in northeast Vietnam. This group has a long-standing tradition of wet rice cultivation. Living in a sloping area, they have extensive experience in adapting to the natural and social environment. The question that this research seeks to address is *how* the Muong people have applied their knowledge in agricultural production.

## 2. GENERAL INFORMATION ABOUT XE II HAMLET

### 2.1 NATURAL AND HISTORICAL CONDITIONS

Xe II hamlet is located about seven kilometers from the center of Van Mieu commune. The communication between the hamlet and other neighboring hamlets is based mainly on two roads: a small one that skirts along a large stream and another that runs along a roundabout course along sloping hillsides. Travel between the hamlet and its neighbors is difficult, especially during rainy and flood season, due to the interruption of traffic and communication by the stream's high water level.

Fifty years ago, the Xe II hamlet had about 20 households of Muong people and was named Xe Trong. Since 1991 it has been called Xe II, and today it contains 91 households with 481 people. The larger part of its population is Muong people. Its current population consists of both former local people and immigrants into the area. Only one person among the 91 households members is Kinh. The origin of the other Muong emigrants is uncertain. Through direct interviews, we found that many other ethnic peoples who came here for different reasons perceived themselves as Muong people and adopted the

Muong family name of Ha (a common family name of Muong people in Van Mieu village). The emigrants in the hamlet, whether they belonged to Muong people or not, quickly integrated into the community after only a short residence. They adopted the same behaviours with respect to the natural and social environments as the local people. The residences of the hamlet's people are scattered all over the hamlet, forming small residential areas. This situation sometimes causes difficulty in daily communication among them.

The total natural area of the hamlet is 543 hectares. The rice acreages include areas for two crops, one crop (including the areas that the local people self-cleared), and areas for rice seeds. Though the rice acreages are divided into two and one crops, the people can cultivate both crops in both areas thanks to the available water resources. This is a favourable condition for wet rice cultivation, especially in winter (the tenth-month crop), but it is also a difficult factor in land retention during the flood season, especially in retaining the rich soil for the summer crop (the fifth-month crop). There is a phenomenon of soil erosion on the high fields and soil accumulation on the lower ones.

The natural conditions strongly affect agricultural production and form one of the foundations that influence the people's appropriate style in making use of land to overcome those conditions.

## **2.2 THE IMPLEMENTATION OF LAND ALLOCATION POLICY AND THE USE OF LAND BY THE HOUSEHOLDS AND COMMUNITY SINCE 1989**

In 1989, in accordance with Resolution No. 10 dated April 5, 1988, of the Party Secretariat on renewal of agricultural management, the commune administration changed the contract form in wet rice cultivation. In 1992 wet rice land was reallocated to households. All of the cultivation land classified for allocation was distributed to each of the hamlet's current household members to make an average area per capita. After that, based on areas allocated to households in the contract year of 1981, the hamlet adjusted into the standard acreage.

After land had been allocated, the old production method in the time of cooperative and contract completely changed. Instead of a work point method, people had to invest in land for production to bring about benefits for themselves. Land became very important in the people's living. After receiving the land-use certification, people perceived the land as their own property and had a better sense of taking care and using the land.

After directly allocating land to the people, the role of land management of the local authorities presented in agricultural tax collecting and observing and solving problems arose during the relations of land holding and use. For people owning areas swept by flood, the commune's officers suggest to the higher authorities to reduce or exempt them from taxes. The land area that was allotted for

use for the hamlet common living demands, such as the football ground, must have the permission from the commune's chairman.

## **3. THE LOCAL KNOWLEDGE IN WET RICE CULTIVATION**

### **3.1 WATER RESOURCE PROCESSING**

With plentiful water resources, there is no difficulty for the local people to irrigate their fields. Unlike the system of water wheels that directs water to the fields of Muong people in Tan Minh, in Xe II people irrigate their fields through systems of ditches. In Xe II, the water system is the water channels, and those who live far away from the water source can have water tubes. However, usage of the water-wheels is costly in the sense that they are used for one crop only and they are easily carried away during the monsoon. There is a combination of different water systems. The construction and maintenance of these systems should be supervised by groups of households. They have one person in charge of these activities who is called water guard. He or she is paid by rice, with each household paying, on average, one kilogram of rice per crop. The responsibility of the water guard is to get the water to the first field and control the level of water at certain points of time. For example, in the rainy season the water guard has to remove the field's bank to allow the excess water to run into the streams. In summer, if possible, the field's banks should be raised.

The control of the water level in the fields depends on the households. The lower fields will get the water from the upper fields. After having a sufficient amount of water in the upper fields, farmers will make a small cut on the banks to let the water run down to the lower fields. However, due to the sloping topography, it is difficult to control the water level among fields, and the allotment of water depends on agreement among field owners of the same level. During drought, field owners of different levels have to negotiate with each other to set the level of water needed for each field to ensure sufficient water for the crops. In situations of serious shortage of water, transplanting of rice seeding for distance fields or fields at the far end is impossible.

Besides the channel systems, the farmers also use local fishponds as a water control system. In the drought, farmers bail out water from upper stream fishponds to get water for production. It is a common practice in the Van Mieu Commune.

Due to the natural terrain, the problem of soil erosion caused by water flowing between fields is common and cannot be completely addressed. In order to limit these effects, some households have set up a fishbone-like channel system to lead the water into the fields. The area of this system curtails the cultivation area, though it helps to

detain soil nutrients and produce higher yields. However, in the rainy season, fishbone-like channel systems provide no advantages. Households without fishbone-like channel systems bail out the water to the lower fields only after a certain period of fertilizer use and the waters become clear again. Due to the characteristic of the water flow, there is a huge difference between the cultivation methods and yields between fields located next to each other. Lower fields normally give higher yield because they inherit some of the fertilizer used in the upper fields. The water control method used by farmers also helps to minimize these problems.

### 3.2 CULTIVATION PROCESS

Beside the commune authority's criteria of soil classification according to rice output, people here grade the kinds of soil by two criteria: soil quality and water amount. They have a variety of cultivation for each kind. If it is good, it is a kind of black, soft, thick-mud soil that can be ploughed as deep as 20–30 centimeters. If it's bad, it is white, thin-mud, plastic and stone-mixed, and cannot be ploughed any deeper than 15 centimeters. When cultivating, peasants have to remove big stones from their fields, little by little with each crop. In cases where there is insufficient soil in the field, they'll get more soil from the edge or somewhere around the field.

A process of soil preparation for all kinds of soil consists of ploughing, raking and banking. Ploughing and raking must be done repeatedly and carefully for the purpose of a good harvest. The time given to each step of the process varies according to each household. However, when transplantation begins, the fields are almost ready. Rice-seeding fields are those to be done last after the transplantation of other fields. There is a difference in duration for the soil preparation in each crop: three months for the summer crop and one month for winter crop.

Various ways of cultivation have long been in use here, however, during the periods of cooperatives, they were not well-employed. Nowadays they take a significant role as a key element to high effectiveness of agricultural land use. A thorough and closed process of cultivation works well on each kind of soil, but it also requires great amount of labour to gain the highest productivity. Each step of the process is equally important, which people here strictly follow. In case of two-crop fields which happen to be muddy, peasants often skip ploughing as soil is so sticky that the buffalo are unable to pull the plough through them.

The process of cultivation for a household's agricultural production takes place in different fields. When members of a household takes up land, they receive a number of fields equivalent to the distributed area so as to ensure proper land division. Although farmers have the right to exchange fields for convenient cultivation, none of them do. They admittedly do the cultivation in different fields to avoid massive crop failure. Despite the inconvenient

cultivation in scattered fields, it's much safer in harvesting the crop. Moreover, peasants don't want to exchange land as they have long been working in their particular fields since the time of controlled land allocation. They have had the experience to deal with the land's shortcomings and promote its advantages. Thus, in addition to avoiding bad harvest, land exchange is made possible by the understanding of land properties and the cultivation experience on particular pieces of land.

### 3.3 PREPARING AND USING SEEDLINGS

Since 1981, the traditional rice varieties have been replaced by new varieties. At present, the most popular rice varieties are khang dan, lai ba dong, and cong 6, but the latter is less popular. The techniques and experiences have shown them how to get the best variety for the field. Households often use three to four different varieties for one crop. This is very popular within the hamlet. However they will have more difficulty in manuring and transplanting. The perception of the people is that in the case of one crop variety failure, they will have other varieties in reserve. On the other hand, after a long time working on their own field, they can identify what variety is the best for their field. They may have to test on their own field. However that is not the end of the story yet. After identifying the best variety for the field, the farmer has to continue with this and do some more testing. The testing area should be on a small scale to avoid sizeable losses.

A case study is Ms. Ha with a new variety of rice in a *cham benh* (private) field. Her daughter is living in another village and she brought home some of the variety which is best for her field. The trial and curiosity have developed the search for new varieties and higher productivity.

Conventionally, most of the households retain seed for the next crop. The selection of the best field for seed saving is based on experience. They look for a crop that is big, high and tight with the same quality and the bright color. They keep that field for seeds and leave the rice there until they become old. The paddy grains are retained, plucked off and dried in the sun. The length of time that the rice should be dried depends on the sun. If the rice is to become seeds, it will take between one to three months. If it is for food, the longer the time, the better. If the seeds are over-dried, they will not be able to grow again. People in the village sometimes exchange seeds which will help them save on seed costs because the price of a kilogram of rice seeds is often three or four times that of ordinary rice. They often combine ordinary rice and sticky rice in a crop, although the area of the sticky rice is not large. This is a tradition of the Muong people in which they grow sticky rice for their family occasions such as Tet, holidays, funerals and anniversaries. The variety of the sticky rice can be kept for years, and they only change it when there is degeneration in the variety. The sticky rice

degenerates when the rice becomes hard and non-sticky. Preservation of the sticky rice is similar to that of the ordinary rice.

People often choose bad, dry fields with low productivity for rice sowing. The reason for this is that rice sowing will take all of the fertility of the soil and therefore leave less fertility for rice transplanting. They use little fertilizer for rice sowing because if the sown rice is provided with much fertilizer, in the next period it will not grow strong with less fertilizer. So they often choose the strategy of fertilizing the rice when transplanting. They compare this strategy with giving water to a thirsty man. So due to land constraints, people often use the same plot for rice sowing and rice transplanting with more fertilizers for transplanting. However, the productivity may not be very high.

As the weather is cold at the cham benh field, the growing time of rice is longer than for other plants, so they often rotate and sow the cham benh field a week or ten days earlier—depending on the season—so at the end of the crop they can harvest both the public field and the cham benh field at nearly the same time.

For those fields with good soil, they often grow high yield varieties such as the transplanted ones to cover the food needed for their family. For the fifth and sixth ranked soil, they can use a different variety. So to identify which one is most productive for which soil, they test different varieties of rice in the two crops with the similar growing techniques. Then if they experience a crop failure, they change the variety in the next crop. They then compare the output of the crops to identify the most productive variety. Another experience is not to repeat one variety of rice for too long to avoid the satiation problem. Therefore their strategy is to rotate the different varieties within a few crops and then come back to that later. This strategy is very popular.

This is the way people understand the relationship between soil and rice varieties for optimizing output. It is obvious here that although they use new varieties of rice, they still make use of the traditional farming techniques.

### 3.4 USE OF FERTILIZER AND PEST CONTROL

Nowadays, in addition to the use of fertilizers and pesticides, farmers also use green manure, muck and a number of plants from the local environment to increase yields and protect crops.

Farmers usually use soft plants such as bead tree that can be easily disintegrated to make green manure. Generally, green manure is used in the summer crop when there are many kinds of vegetation and hot weather to make the plant matter disintegrate quickly. These plants are put onto the fields after harvesting together with rotten straw. According to farmers, this is a very popular manure which can be made very easily and is very good for soil. Green manure was first introduced here in the early 1960s and is

still widely used and considered a good method for preserving soil nutrients. Even after weeding, banking and soil preparing, farmers usually bury grass into field or dry the grass out before putting it onto the field. There is a saying, “A wisp of grass is a basket of manure.”

Muck including waste from cattle and pigs is used for basal fertilizing. Some households even use chicken dung when the rice plants are in ear. This is very good manure for trees, especially for rice. Different households have different ways of composting manure: some choose to compost it with straw and put it down on fields after it dries, some even compost it by using pigs’ urine. According to their experience, the pig-composted manure is best and buffalo is second, whereas cow dung is difficult to dissolve in water.

The amount of NPK used for crops depends on the household level of economy. However, green manure and muck are more available and easy to make. Farmers can combine different types of manure and chemical fertilizer. In the summer crop, when there is not much green manure, farmers increase the amount of rotten manure or NPK for field. In the case that the green manure and rotten manure are abundant, they reduce the amount of NPK used. They have different ways of using fertilizer and manure for different types of soil. Normally they use more green manure for low quality fields and use more fertilizer during the developing time of rice plants. They discovered the correct proportion and combination of manure and fertilizer after years of using them. It does however also depend on particular households and certain points of time.

In addition to the use of leaves for green manure, farmers chop and scatter leaves, including some smelly ones such as of the bang’ tang tree, on the fields to prevent some types of pests. Some others scatter straw, gasoline, chopped bead tree leaves and bang’ tang leaves. Some even use bitter leaves to protect crops from some insects and some use the smashed root of GAC trees to protect crops from other insects. This is an effective traditional measure, but there are not many GAC roots so it is not widely used. Recently, six households soaked leaves in water and used the liquid for spraying onto the rice plants to control pests and strengthen the quality of the rice plants. Based on the knowledge from agriculture and forestry extension activities, farmers have soaked some hot and spicy leaves to achieve good results. Only in the case that these measures are not effective in preventing pests do they use chemical pesticides instead. Due to the low effectiveness of pesticides made from plants, most households prefer chemical pesticides. Interestingly however, most informants said that the more chemical pesticide and fertilizer used in the fields, the more pests were found.

Recently four households in the hamlet used a mixture of straw and gasoline to protect their fields from mice, and they found that it was effective. Fields that are protected by this mixture have less mice than other surround-



ing fields. This measure was discovered by a farmer and has been shared with another three households. With their understanding of the environment and their creativeness, farmers have identified the best measures to protect their crops environmentally and economically.

### 3.5 POND USE

Unlike in lowland areas where ponds are always attached to the house precincts and to daily activities and are comparatively long in duration, ponds here frequently change. Because the whole area of ponds of households in cham behn were formed on favorable waters such as waters between hill slits, the fields are placed deep near water resources so they are often destroyed in flood seasons. However, weather conditions are not of major consequence for the economy or for the household labor forces. Often ponds are formed rather simply, with little labor, and they are highly flexible. To form the depressions for the ponds from channels, peasants use soil to block the two ends, and for ponds formed on fields, mostly on low-yield fields, peasants scrape the mud below to the bank. Then water flows in and a barrier is formed to allow unnecessary water in the ponds to flow away. Their flexibility is also useful in the changeable area of the ponds. During its period according to the economic effects desired, ponds can be used either to raise fish or to grow rice. When they do not raise fish, they can drain away some water to grow rice and divert water back in to raise fish. This method to use planting land can be considered as a creative and effective and is also suitable for the natural and economic features of the land.

### 3.6 LIVESTOCK CONTROL

From the beginning to the end of the crop, the authorities of these communes strictly forbid livestock breeders from unleashing their cattle, which can bring harm to the crop. During this time, all households have the responsibility to take care of their cattle and poultry, and they may have to pay compensation if their livestock damages the crops of other households. However, due to the close public unity of people here, animals rarely break away, and if they do, it is often solved through private reconciliation between families.

## 4. CONSERVING AND HANDING DOWN KNOWLEDGE ABOUT THE REGION

Nowadays, knowledge about the region is handed down in an unwritten form and is conserved mainly within the family and community environment. In a family, the role of the experienced elders is very important. They are the ones who give advice to the other members of the family, especially the youth, so that the whole family knows the

right way for doing things, bringing good results in work. Through daily information exchange about work and through testing food productivity of each crop, the whole family can easily report good ways suitable for the family. Through daily work, family members can learn and practice directly their experiences. These experiences are handed down and conserved from one generation to another in the family, through the advice of the prior generation to the next.

Outside the immediate family, the larger descent group also plays a certain role in passing down experiences. The best ways of working are shared among consanguineous kin. Additionally, in open family meetings people remind and share good experiences that are effective, both in the past and at present. Therefore, besides immediate relationships within a family, consanguine relationships within a kin group provide an environment for the local knowledge to be conserved and handed down.

After family and kinship, community is the biggest network to widely spread the local knowledge about working. By story exchange methods of working effectively among members of the community, knowledge of each individual, each family, each kinship is popularized. Knowledge that is approved by many members of the community gradually becomes common knowledge, common property. It cannot disappear and is always perfected with time to adapt to the new conditions of the region.

These days, in community meetings or meetings with people from other regions, the head makes publicizes those experiences in theory for people to learn. Each person applies this knowledge in his or her work. Through time and application results, each individual and the whole community can find the best way to continue applying in production. Experiences approved and applied by the whole community are those that are sound, the most appropriate to the conditions of the region, and have high stability.

In addition, in the field of handing down knowledge about the region, differences in gender are very clear. Mostly it is men who always seek effective ways from other places to apply for themselves and their family. Men tend to roam farther and they learn many good working experiences to tell their family members. But women are usually more industrious and more skillful. That's why women are those who draw more effective ways to decrease labor requirements.

For handing down knowledge about the region, the role of women is much more notable than that of men. As they are open-hearted and encouraged to be communicative by society, they are the ones to hand down newly drawn out experiences the most quickly and widely. They can exchange experiences anytime and anywhere. While sitting in the meeting, they can have private exchange about whatever they know. They do not tend to hide effective working ways that have been applied in their family. Conversely, men tend to be more discreet and quieter. This does not mean that they do not exchange good working experiences

that they have learned or have drawn out. They often speak about their good working experiences if they are asked. Moreover, they tend to speak out about these experiences when they feel that their audience places belief in them.

## 5. CONCLUSION

The implementation of the policy of entrusting land and forest to people in this region helped the people here to improve the region's knowledge by encouraging them to do the farming with high results. After receiving the land, as the land belongs to individual households, they spend most of their time, labor force and knowledge in exploiting the land effectively to meet the living as well as economic needs of their families.

As a remote commune with transportation difficulties, knowledge and experiences in land tenure of people in Xe II have helped them to find the most effective ways to use their land.

Wet rice cultivation is a long-standing tradition of the Muong people, who have benefited from scientific and technical know-how. However, they have preserved traditional techniques in land preparation and irrigation, with positive effects on soil fertility and protection from soil erosion. Although many villagers use new rice strains, they have carefully selected different rice varieties to suit plots located in different conditions. The villagers continue to use compost and some traditional materials against rice pests and rats, in addition to chemical fertilizer and pesti-

cide. Just as in wet rice cultivation, people have preserved and developed local knowledge about livestock breeding. They are flexible, combining rice farming and fish rearing in the same fields.

The paper concludes that the traditional knowledge of the Muong in Xe II village has made valuable contributions to community development. The knowledge has been preserved and handed down from generation to generation within families, family clans and villages, through exchanges during farming activities, leisure time, and meetings. The paper also finds that people of different gender hold different kinds of local knowledge.

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