People´s options on forest land use

Government plans and farmers´ intentions - a strategic dilemma

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PREFACE

The series of draft and finalised Working Papers of the Sida / Sarec funded research co-operation project "People's options on forest land use" has several objectives.

In conjunction with ongoing field work, the Working Paper serves as an instrument to make available to national research institutions and other interested parties a preliminary documentation, directly related to the field work. The Working Papers are used for workshops and seminars, the objective of which is to discuss and further develop the issues considered relevant in the national and local context. They are also used as reference documents in relation to other work with the national authorities at central and local levels.

The Working Papers, especially in draft form, might lack in academic standards and style and there are only scattered references to other research, but they could still serve the purpose of developing co-operation and further discussions. The authors warmly receive comments on the content. Any citation of this paper in research publications is not agreed upon at this stage without approval by the authors.

In this paper, Bo Ohlsson is the author of chapter 3.3, 4.3, 5.2-5.4, 6.1-6.4 and Annex B–C.
Mrs R. Kajsa Sandewall and Mrs Tran Thi Binh have written part 3.4, 4.1 and 5.5.
Mats Sandewall has authored the remaining parts and he has also edited the report.
Mr Pham Quoc Hung has run the final scenarios with the Area Production Model, APM.
The work has been co-ordinated and greatly facilitated by Mr Vo Tri Chung.
The principal researchers have discussed and are jointly responsible for the conclusions.

Photo 1: The villagers, the commune staff and the research team who participated in the "village dialogue" in Lang Ha by the end of the field research session on March 25, 1998.

ACKNOWLEDGEMENTS

This paper has been prepared with the direct or indirect support and co-operation of a number of persons and organisations to whom we are sincerely grateful. We would particularly like to mention the following offices and their staff.

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Ban Lau Commune
The People of Lang Ha Village

Sida/Sarec, which provide the funds for our work.

We realise that without the generous support provided, it had not been possible to conduct our studies in a remote and sensitive area on such short notice and with the excellent arrangements that we have experienced. We have felt a sincere and positive interest from all concerned and it has greatly facilitated and stimulated our work.

Umeå and Hanoi in June 1998

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1. INTRODUCTION

”People’s Option on Forest Land Use” is a multi-disciplinary research co-operation project carried out jointly by the Swedish University of Agricultural Sciences (SLU) and the Forest Inventory and Planning Institute (FIPI), Vietnam. Project activities are also carried out in Lao PDR. The Project, running for 3 years (1997-99), is funded by Sida/SAREC.

The objective of the Project is to develop approaches and methods that could improve the process of strategic planning in relation to a sustainable use of forest land.

This report presents the findings of a case study in Ban Lau Commune, Lao Cai Province carried out within the Project during March, 12 - 27, 1998. A preparatory study was carried in Ban Lau Commune during April, 1997 and it’s results presented in another Working Paper (ref. 10).

A draft version of this paper (1998-04-10) was presented to and discussed with the participants in a seminar at FIPI, Hanoi on April 13, 1998.

2. CHOICE OF STUDY AREA AND SCOPE

Following last years introductory study in Ban Lau Commune, one of it's villages, Lang Ha, has been chosen for the case study.

Lang Ha Village was chosen for a number of reasons. The land use of Lang Ha comprises many types of land use (paddy, fixed upland cultivation, shifting cultivation both inside and outside village boundaries, fruit orchards etc). There are two different ethnic groups in Lang Ha (Kinh and Dzao). The village center is located about one (1) kilometer from the road and it has been settled there for more than 50 years, but a considerable amount of agriculture is carried out in remote areas. The village has entered a dynamic process of agriculture diversification and economic development.

There are other villages in Ban Lau Commune having a more difficult land use situation. However, they are quite recently settled and have a less diversified land use. For the main purpose of the study (to develop and test planning approaches) Lang Ha Village was considered the most feasible. On the other hand, for covering the main, or at least the most difficult, strategic issues in Ban Lau Commune, it would be quite necessary to also include some more recently settled villages in Na Loc, the western part of the Commune.

The Study is focused on the process of land use strategy development. The main objective is to identify the current situation including the roles of commune, village and individual households and to test approaches and tools that could facilitate the process.

Some important components:

- Testing of a land use inventory technique for determining current actual land use and historical changes of land use.
- Methods for identifying and analysing land use strategies on village and household levels.
- Analysis of the outcome of the land allocation carried out in the village during 1997 and now waiting to be approved.
- Testing of the Area Production Model (APM) as a planning tool for developing land use scenarios
- Analysis of a Master plan for land use in Ban Lau Commune approved in 1997 and covering the period 1997 – 2010.

3. APPROACH AND METHODOLOGY

3.1 Approach

A general hypothesis of the Project is that all concerned parties have strategies (written or not) which influence the land use. When it comes to a village (like Lang Ha) we can identify the Commune, the Village (as an entity) and the individual households as major concerned parties. It appears reasonable that all those parties should also be involved in the strategy development process.

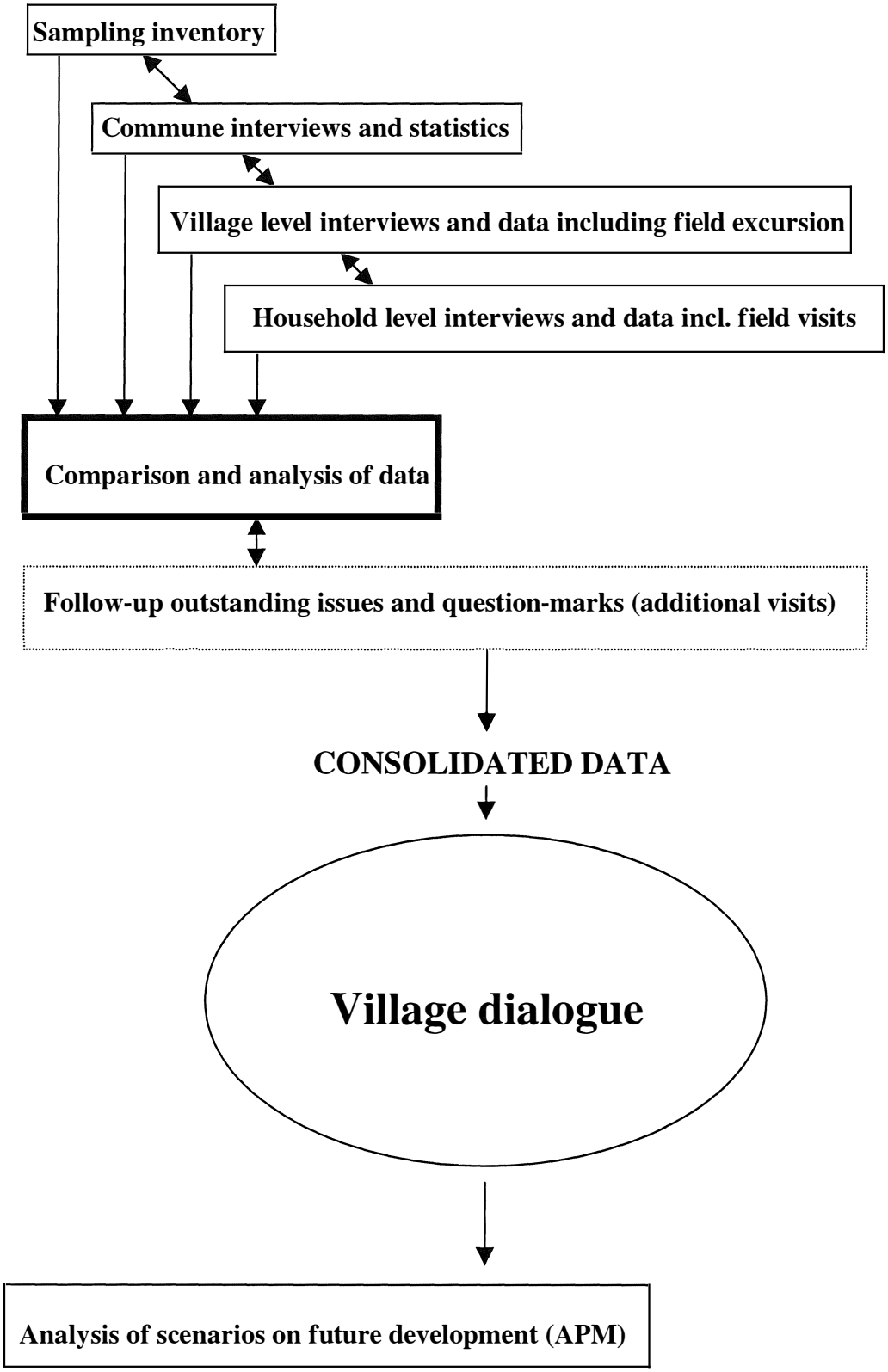
A strategy describes a path to go from the current to a desired future situation (the objective). It is quite important to be able to describe the current situation in a correct and specific way (and not only the goals). As all the above parties have their own interests to defend it is reasonable to try and obtain an objective assessment of the actual current situation. In the Study an independent sampling inventory has been designed for estimating the current land use.

Another hypothesis of the Project is that awareness of historical trends is important for entirely understanding the current situation, changes taking place and for evaluating optional strategies. Besides, the historical perspective is necessary for estimating the rate of various sorts of changes. Based on previous experiences made in the Project, it is also a good way to stimulate the villagers to participate actively in the strategy discussions. The work of the Study includes the tracing and reviewing of historical developments.

For a deep understanding of the current situation field observations should be undertaken as a complement to indoor discussions. The approach applied in the Study is that interviews and discussions are undertaken on the spot of the activity discussed whenever feasible (the “talk, walk and touch” principle).

The working methodology of the Study is illustrated in Fig 3.1

Figure 3.1: The work process - capture and analysis of data from different sources



3.2 Sampling inventory of past and current land use

The main purpose of the sampling inventory carried out in the study was to estimate the actual land use and land use changes as a base for strategic considerations and for evaluating information from other data sources.

The inventory was based upon a systematic and objectively distributed grid of sampling points covering the entire village area (figure 3.2). To balance the statistical error and the time required to carry out the survey the distance between the plots was set in such a way that about 50 plots would be distributed (it turned out to be 56).

Each point was visited in the field by the researchers and a "key-informant" of the village. To provide data on the official status of the land a cadastral officer of the Commune also joined the inventory team. The key-informant was a senior villager with good knowledge of current and past land use over the last 50 years.

A compass, but no measuring tape but only "step counting", was used to identify the sampling points. On every such point, the key informant explained about the current land use (last year, 1997) and also the land use in various years of the past. In addition, some data on official land use status (i.e. land allocation) and other relevant information was recorded.

The following information was recorded on each plot

1. Current (1997) land use:

- Land use category
- No of crops and crop type(s)
- Yield (high/average/low)
- Destination of crop (subsistence/market)
- User of the land

2. Land use in some other years (1960, 1968, 1980, 1990, 1995, 1996 and 1998):

- Land use category
- Crop type
- No of crops

3. Land allocation status

4. Other relevant information

The information on current land use could partly be verified by visual observation on the spot. Historical information could to some extent (1968 and 1995) be verified using a satellite photo of those years covering the area (figure 4.4 - 4.5).

No printed field form was used, but recording was done in a notebook allowing comments and specific information to be added when needed. Two (2) days were required to carry out the fieldwork. The processing of data was done on pocket calculator and required less than one day to complete.

Figure 3.2: Principle outline of the point sampling carried out in Lang Ha village

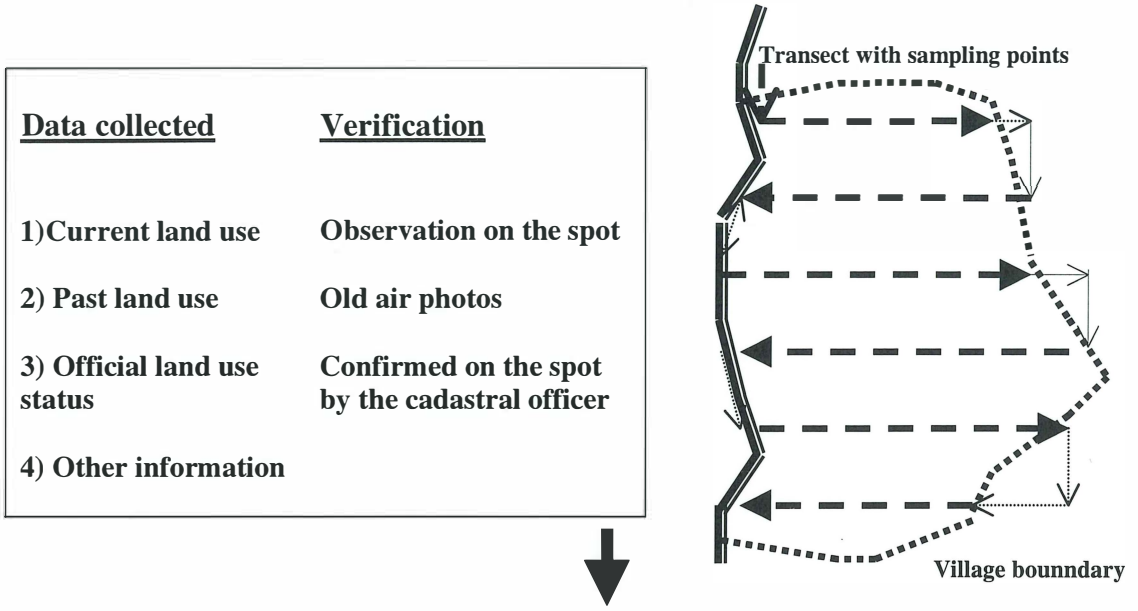


Photo 2: Discussion of past and current land use on one of the sampling points

3.3 Work with the Commune and the Village

During the fieldwork in Ban Lau Commune previous year, the focus was on the Commune and five (5) villages. During the present fieldwork, the focus has been on one of those villages and a number of selected households. However, at Commune level, discussions have also been held concerning the general Commune activities and how the Commune is addressing the present situation, both with regard to government initiatives such as the land allocation and with regard to the actual development in the villages of the Commune.

There have been two formal meetings with the Commune. The Chairman, the deputy Chairman and 2 - 4 members of the Commune staff have participated. The meetings have been held in the premises of the Commune. The first meeting was in connection with the arrival of the research team and the second was a meeting aimed at discussing the Commune organisation and activities to address problems and opportunities in relation to Commune development. It very much concerned Commune strategies for development. When opinions and information about the Commune is being discussed in this report, it is the author's interpretation of what has been said by the Commune.

In the relations with the Commune, it has been an important issue that the Commune is very well aware of the purpose of our mission. In essence, we have told the Commune what we intend to do and asked them to assist us. Thus, there has been no hidden agendas or "clever methods" (if such do exist!) to elucidate information but rather a very straightforward relationship.

The "village" refers to the formal village leadership - the village leader, the leaders of the different associations (women, youth, national front, farmers etc). Others have also been present during the discussion, e.g. the elder and various farmers - men and women, who happened to pass by and join the meeting. Still, the views presented as the "village view" is based upon the information of the village leadership. During the discussions, checklists have been used, notes taken and maps drawn. Usually, the notes from one day have been rechecked the next day and sometimes complemented. The reason is that when the research team has discussed results in the evenings they have realised that issues have not been fully understood or gaps have been discovered.

Cross-checking of data has been done continuously whenever possible (see also ref. 10). Likewise, in all cases when possible the information received through the village leadership has been verified by actually visiting the concerned areas. For example, after discussing the ongoing trend of converting former shifting cultivation land inside the village territory, both converted land and not yet converted land has been visited and discussed *in situ.* Also, independent cross checking has taken place by having three different teams working with different village informants and with different methods such as the point sampling of the village territory.

Photo 3: Discussing land allocation around the "Red Book" in the Commune Office.

Photo 4: The research group interviewing one of the sampled households in front of their house.

3.4 Work with the sampled households

Based on socio-economic stratification used by the Village of Làng Ha , four categories of households were classified; wealthy (with income from outside), well-off (with skills in farming), average or middle-class, and marginal households (see Chapter 5.3).

In order to be able to identify the current situation of individual households in general and to know about their future plan of strategies on land-use, two representatives of each category were purposively sampled to be interviewed. Totally eight households were interviewed.

Responsible for household interviews were two female researchers, an agronomist (Swedish citizen with Thai origin) speaking fair Vietnamese, and a Vietnamese forest engineer speaking fair English and somewhat Thai. Being present throughout interview activities was the leader of Women's Union of the village. She is Dzao and also speaks Nùng language, which is similar to the north-eastern dialect of Thai language.

The interviews were conducted under informal and relaxed circumstances, using a check-list coupled with direct observation and applying a method of "walk talk and touch". Both parts (interviewers and interviewees) could communicate with each other through a mixture of three languages, English, Vietnamese, and Thai. The atmosphere of the interviews became very pleasant soon after the presentation of the interviewers.

Each household interview, including a round-visit to all plots (within the village boundary) of the household, was scheduled as one-day work. After finishing interview of the day, the interviewers spent the rest of the time on making familiar with those households outside the interview frame, either at their homes or in the fields where they were working, in order to be considered non-strangers in the village.

The first part of each interview, dealing with background, economic condition, and current land-use of the household - including land-use sketching and the history of each plot - took place at the house area (sitting inside and walking around). In most cases during this part of conversation, both husband and wife were present.

Since the interviewers were considered by the interviewed households being their guests, the invitation to lunch of the day by them could not be avoided. However, the interviewers brought daily picnic lunch to join the "traditionally simple lunch" with the interviewed household.

The second part of the interview was conducted after lunch of the day. This part dealt with the couple's perception of their current land-use, their future plan of land-use strategies, and their opinion about the land allocation. To enable both the man and the woman to express their independent ideas, a separate interview was held with one of the couple at a time through the same topics. First, either of them was interviewed while leading the interviewers to take a look at the land-use plots of the household. Later, his or her better half was interviewed at home or in the field, depending on where she or he was. Since it was the peak period of paddy plantation, the couple

made shift during the second part of the interview by replacing each other between the interview and the paddy plantation activities.

Cross checking of data and brief discussions, both within the group and with the other groups, were carried out every evening. Some gaps of information discovered would be filled up in the following day.

4. VILLAGE HISTORY

4.1 Settlement history and demographic changes

Làng Ha is a heterogeneous village, consisting of two ethnic groups. The major group is Dzao and the minor one is Kinh.

No one can tell about how old the Village is. However, it has been confirmed by some of the key informants in the Village that they are of the third generation descending from the first group of the Dzao settlers of the Village. They were told by the older generations that before their grand-parents came to Làng Ha Village, it was inhabited by Tày ethnic group. The Tày traditionally lived on paddy cultivation. At the time, the Dzao were living in a valley named Lùng Sà, about 5 km. away from Làng Ha, and practising shifting cultivation. When the Tày group emigrated from Làng Ha, they sold every thing including the paddy fields to the Dzao, who moved from Lùng Sà and took over the Village since then.

The accounts, being told above, therefore, indicate that the Dzao Community in Lang Ha must have existed since some time between 1920-1930. When the first group of the Dzao arrived at the Village, they found that the area of non-forest cover in the village was mostly covered with Imperata, which is called *"Ha"* in Dzao language. The group, then, named the village *"Làng Ha"*, which means "Village of Imperata". At the time, however,the surrounding area of the village was still covered with dense forest.

The first group of the Dzao settlers comprised six households. Those paddy fields sold by the Tày were not enough for the whole group of the new settlers. Only three households among them took over those paddy fields, the other three, therefore, cleared the forest area and established more paddy fields.

Although population of the little hamlet had increased over time, reaching the third generation in late 1940s, the number of households did not increase. The Dzao families still lived in the six expanded households.

Years after years, the six households led their lives peacefully in the little hamlet of Làng Ha, living mainly on paddy fields. Realising that their living at Làng Ha was much more comfortable than that they had had in the previous period at Lùng Sà, the group planned to develop their agricultural activities in the village in order to further improve their living, and decided not to return to the shifting cultivation practice at Lùng Sà.

When a severe drought occurred in 1949, the villagers of Làng Ha could not get any product from their paddy fields. As a consequence, they started clearing forest land on the surrounding hill slopes and cultivating upland agriculture, growing rice and maize for their living. Anyhow, they could manage the critical situation without a need to return to Lùng Sà. After 1949, and so far, such a drought has not re-occurred.

In 1950, the hamlet covered seven households. Then, in 1952, two households emigrated, and the hamlet was inhabitated by the remaining five households until 1954. Just before the end of colonial period, in 1954, a gravel road from Lào Cai to

Muong Khuong was constructed by the French. The road is located about 1 km away from Làng Ha.

After the liberation from the French, the new government introduced many changes in socio-economic conditions. A series of mass campaigns was conducted by the government (ref. 3). Some of the objectives of those campaigns were, for instance, to eliminate illiteracy, to suppress shifting cultivation, to introduce modern farming technologies along with establishing the agricultural co-operative system, and so on.

During 1960s, when the agricultural co-operative system was implemented, the management of paddy fields was handed over to the government. The people of Làng Ha then learnt from their experience in working with the co-operative system that the outcome of their labour-input did not meet their needs. Therefore, in order to fill up their needs, they made the first return to Lùng Sà in 1968, by commuting between the village and Lùng Sà, and resumed their shifting cultivation practices. Also, this year, the villagers started sending their children to school in Ban Lau Commune. The first group of school children from Làng Ha consisted of five girls and without any boy. The first boy was sent to school in Ban Lau in the following year.

In 1969, participation of women in administration and development of the village was recognised and the local Women's Union of the village was established, initiating with seven members. At the time, there were six households living in the hamlet.

In 1975, seven households of Kinh ethnic group from Thái Bình migrated to Làng Ha, conforming to the government's policy on socio-economic balance. The population of the little hamlet then became 13 households. Since the Kinh originated from low-land area and were traditionally keen on cultivating paddy fields, they introduced the two-crop system of paddy cultivation as soon as they settled at Làng Ha. The Dzao expressed their satisfaction with such a new technology transferred by the Kinh.

Population in the little hamlet of Làng Ha had increased to 16 households, when the boundary war between Vietnam and Chinese broke out in 1979. One night in the middle of February 1979, the inhabitants of Làng Ha were surprised by a group of Chinese soldiers. Desperate and frightened, all fled their home immediately without taking any belongings with them. The Kinh went back to Thái Bình, while the Dzao went to another Dzao community in Bao Yên District of Lào Cai Province. There was no casualty in the incident, however.

After less than two months time, the villagers successively returned to Làng Ha. At the beginning of 1980, Làng Ha had its 15 households returned. Since the villagers had lost all their necessities caused by "the surprising visit" of the Chinese soldiers in that night of the war-time, they needed to replace their losses by new necessities immediately. Thus, all households commuted to Lùng Sà again in 1981, and resumed their shifting cultivation activities to generate extra income.

By the end of 1981, number of households at Làng Ha rapidly increased to 23 households, because some young families separated from the households of their parents and some Dzao households from other villages moved into Làng Ha. At this stage, the small hamlet of Làng Ha became a solid village.

However, since the population of the village had increased and the agricultural co-operative system had not been satisfactory, many households gradually moved out of Làng Ha to other locations where they could have wider areas to practice shifting cultivation, apart from the compulsory co-operative system. Only 15 households remained in the village in 1983.

When the government began to transfer the management of paddy fields to individual households again in 1988, the people of Làng Ha successively returned to their village again. Totally 29 households living there in 1990.

Since then, a great deal of improvement has occurred to the lives of people in Làng Ha through a so called "open-door policy" of the government.

Many forms of new technology and investment were introduced in Làng Ha, for instance, threshing machines, Chinese hydro-electric generators, Chinese varieties of rice (giving much higher yields than those of the native ones) along with the use of commercial fertiliser and pesticides, new species of forest-trees and fruit-trees, and above all, television (as a significant source of comprehensive information and knowledge) (Table 4.2).

The village accommodated 34 households in 1997. This year, land allocation process of the village was underway.

The current village headman is of the Kinh ethnic group and the leader of the Women's Union of the village is of the Dzao ethnic group. All together, 41 households are living in Làng Ha in 1998. Both the Dzao and the Kinh seem to get along well with each other.

In Figure 4.1 the demographic changes in Lang Ha over the years are summarised. The demographic changes are further analysed in Chapter 7.

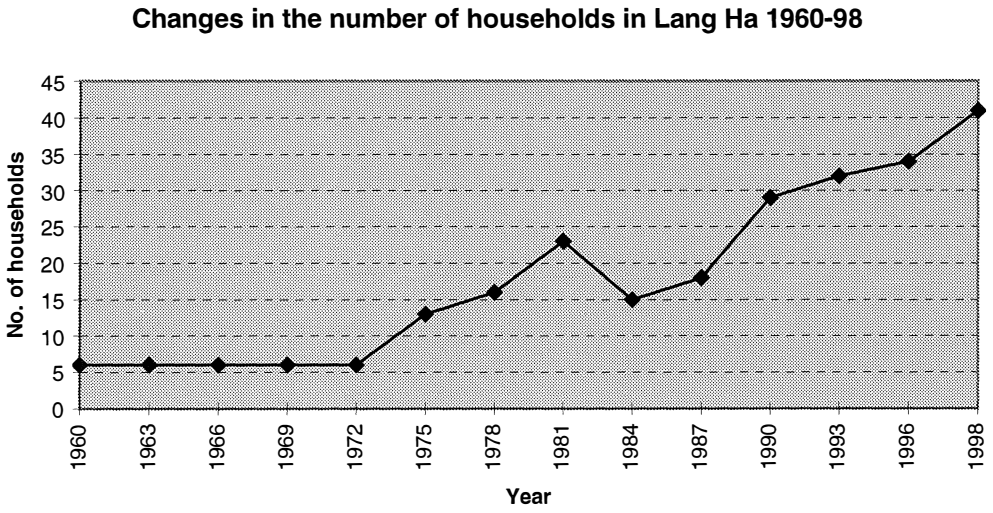


Figure 4.1: Change in the number of households in Lang Ha 1960-98

Time Line

Years	*Events*
Some time between 1920-1930	Six (6) households of the Dzao ethnic group, moving from Lùng Sà, replaced the Tày ethnic group in Làng Ha.
1949	A severe drought occurred, hampering products of paddy cultivation. People started clearing forest area and practising upland agriculture around the village.
1954	A gravel road from the centre of Lào Cai Province to Muong Khuong District was constructed by the French. It was located about 1 km. away from Làng Ha.
1960	Co-operative system was started in the village and management of all paddy fields was taken over by the government.
1968	The villagers resumed their shifting cultivation practice at Lùng Sà. .
	The first group of children from Làng Ha Village was sent to school in Ban Lau.
1969	Women's participation in administration and development of the village was recognised and Women's Union of the village was established.
1975	Seven households of the Kinh ethnic group, migrated from Thái Bình to Làng Ha. A two-crop system of paddy cultivation was introduced at Làng Ha by this group.
1979	The boundary war between Vietnam and China broke out. All the villagers fled Làng Ha.
1979-1980	The people of Làng Ha gradually returned to the village.
1981	All households resumed their shifting cultivation practice at Lùng Sà in order to

	have access to the necessities they had lost during the boundary war.
1988	The end of the co-operative system resulted in transferring of paddy-field management from the government to the individual households.
Since1990	Many forms of technologies and investment have been introduced in the village of Làng Ha.
1997	Land allocation process was underway.

4.2 Land use history

The land use inside the village boundaries of Lang Ha has been estimated for the period 1960-97 through the sampling inventory (fig 4.2). For the period before 1960 there is not any systematic data but some scattered pieces of information.

The shifting cultivation by Lang Ha villagers in Lung Sa (valley outside the officially accepted village boundaries) could not be so precisely described. However, the area has been approximated based upon the number of households of the village told to be active there and confirmed by a field visit and some satellite photos (fig 4.4 - 4.5).

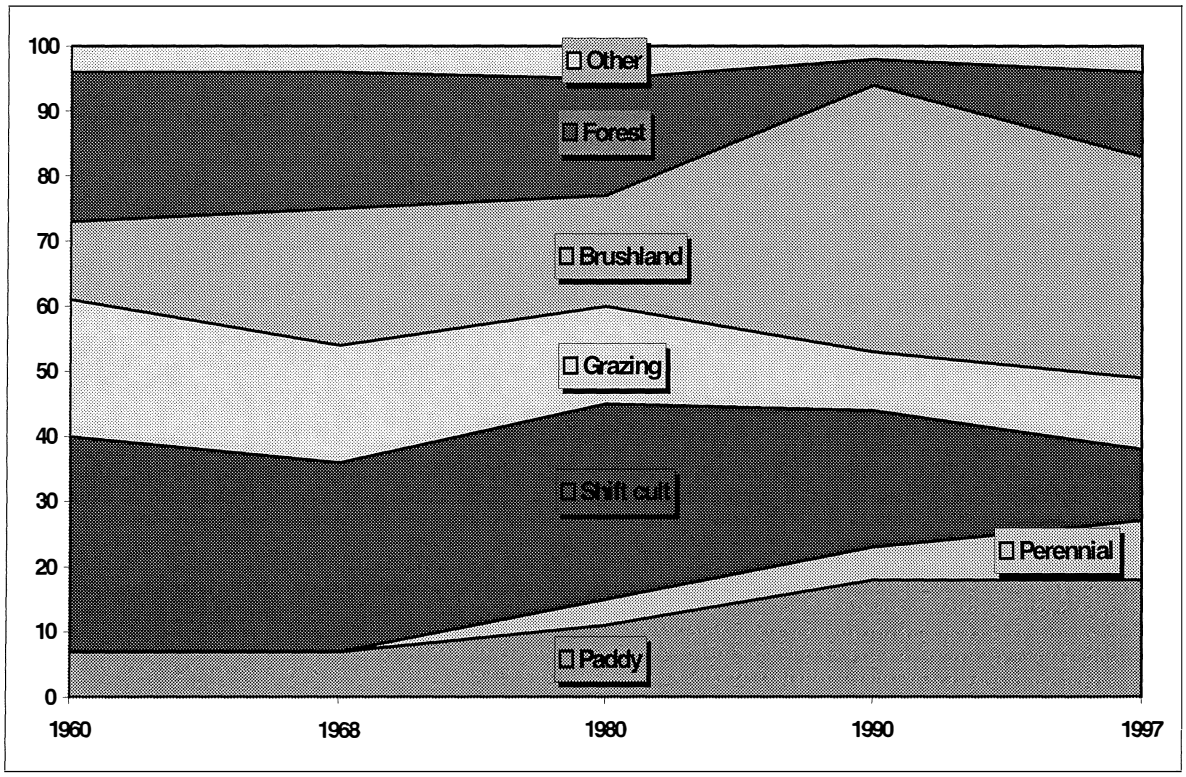


Figure 4.2: Land use within the boundaries of Lang Ha 1960–1997 (% of village area)

The area of paddy fields has gradually been increased with the growing population from some 8 ha in 1960 to about 20 ha (18% of the village area) in 1998. Many of the fields used in 1960, by the co-operative at that time, were developed more than 60 years ago by people of the Tay ethnic group who lived there before, or by the first Dzao settlers. The central upper plains of paddy were first developed. Those fields developed after 1960 were mostly located in the outer range of the village, terrace fields in steeper sloping terrain or at lower altitudes. The irrigation system has been extended step by step in such a way that a dominant part of the fields (sampling data) provide two crops of rice.

Shifting cultivation was practiced by the Dzao ethnic group long time ago when they lived in Lung Sa (Chapter 4.1). When moving to Lang Ha there was enough paddy fields for them at first. However, by the end of the 1940s drought forced them to take up shifting cultivation in Lang Ha by clearing old forest. By 1960 more than 30 %

was used for shifting cultivation and forest cover was down at 23 %. Not only villagers of Lang Ha but also people from neighboring villages used the area of current Lang Ha for cultivation (esp. maize).

During the 1980s the extent of shifting cultivation inside village boundaries has decreased (although probably not in the first years of the 1980s when there was probably shortage of paddy). An important reason is that many villagers returned to Lung Sa to carry out shifting cultivation there at that time. Some of them also used Lung Sa since the late 1968. In 1998 some 11% of the area inside village boundaries are used for maize and cassava cultivation on swidden fields. A minor part of that area is used by a neighboring village (Coc Tru).

The abandoned shifting cultivation areas were turned into brush and sometimes grazing land. Grazing is still widespread and unorganized. Anybody can send the buffaloes and cattle anywhere and has contributed to maintaining a degenerated status of the brush land areas. Sometimes fires have been arranged to create young grass to facilitate grazing. Some areas are covered by Imperata grass which has been used by the villagers in the past for roofing. Therefore, the Imperata regime has been favored, which in turn has made it difficult for forest to recover. The trend in the diagram for grazing areas is very uncertain as it difficult to distinguish what brush land and forest areas have been used for grazing.

The forest cover decreased particularly in the 1980s when the population increased quickly. Forest was cleared, cultivated one or two years, abandoned and turned into brush and grazing land. In the 1990s it seems as if some of the brush land is slowly recovering into forest again, in some cases with the help of the villagers who plant trees or manage bamboo stands. However the increase is not very distinct and some of the "young forest" is still quite degenerated.

A significant trend is the establishment of perennial plantations and fruit orchards in recent years, particularly during the 1990s. There were no such plantations 30 years ago and they now represent nearly 10 % of the village area.

The "other areas" in the diagram mainly represent housing areas and infra structure.

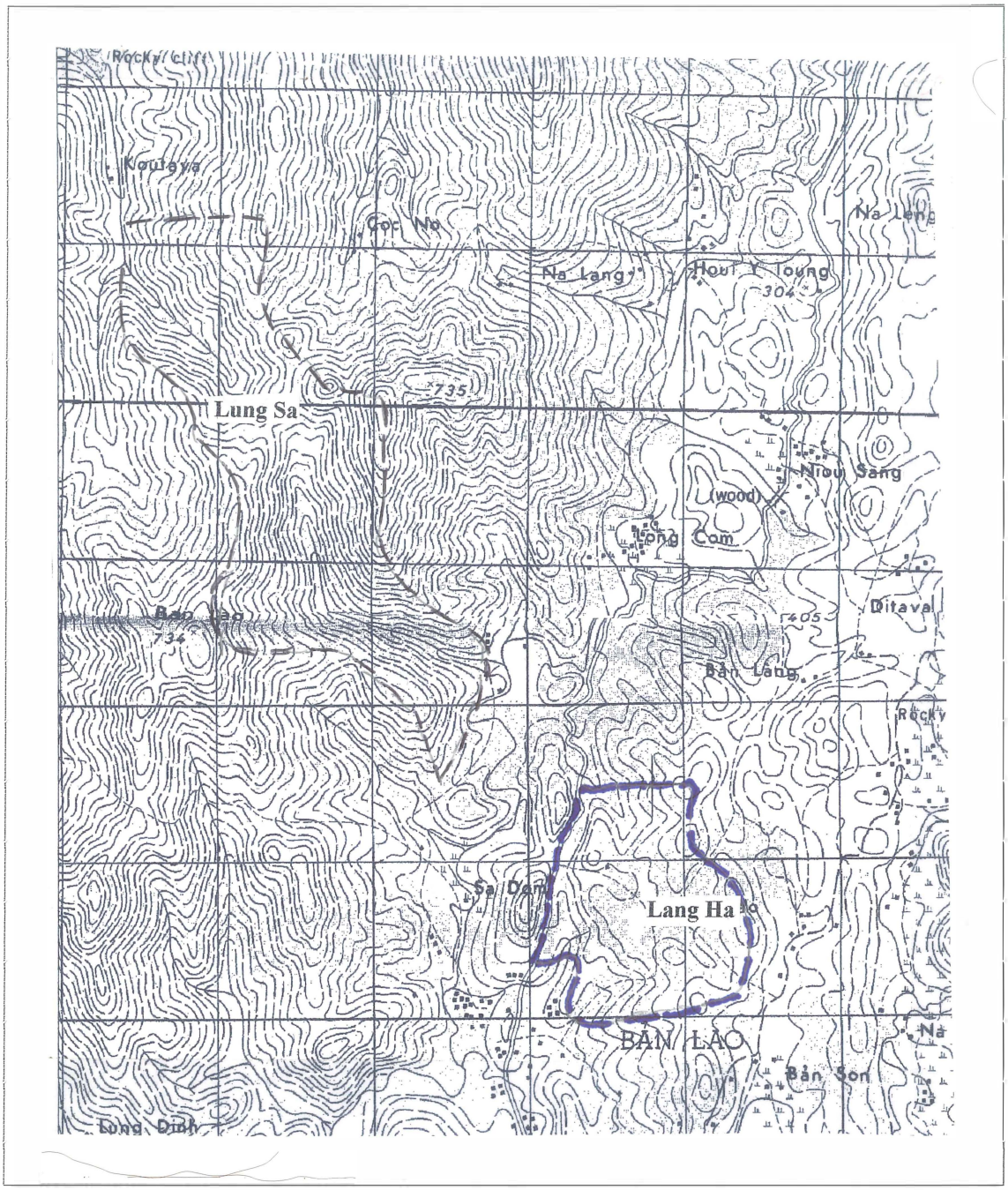


Fig 4.3: Topographic map showing the location and extent of Lang Ha village and the shifting cultivation area in Lung Sa.

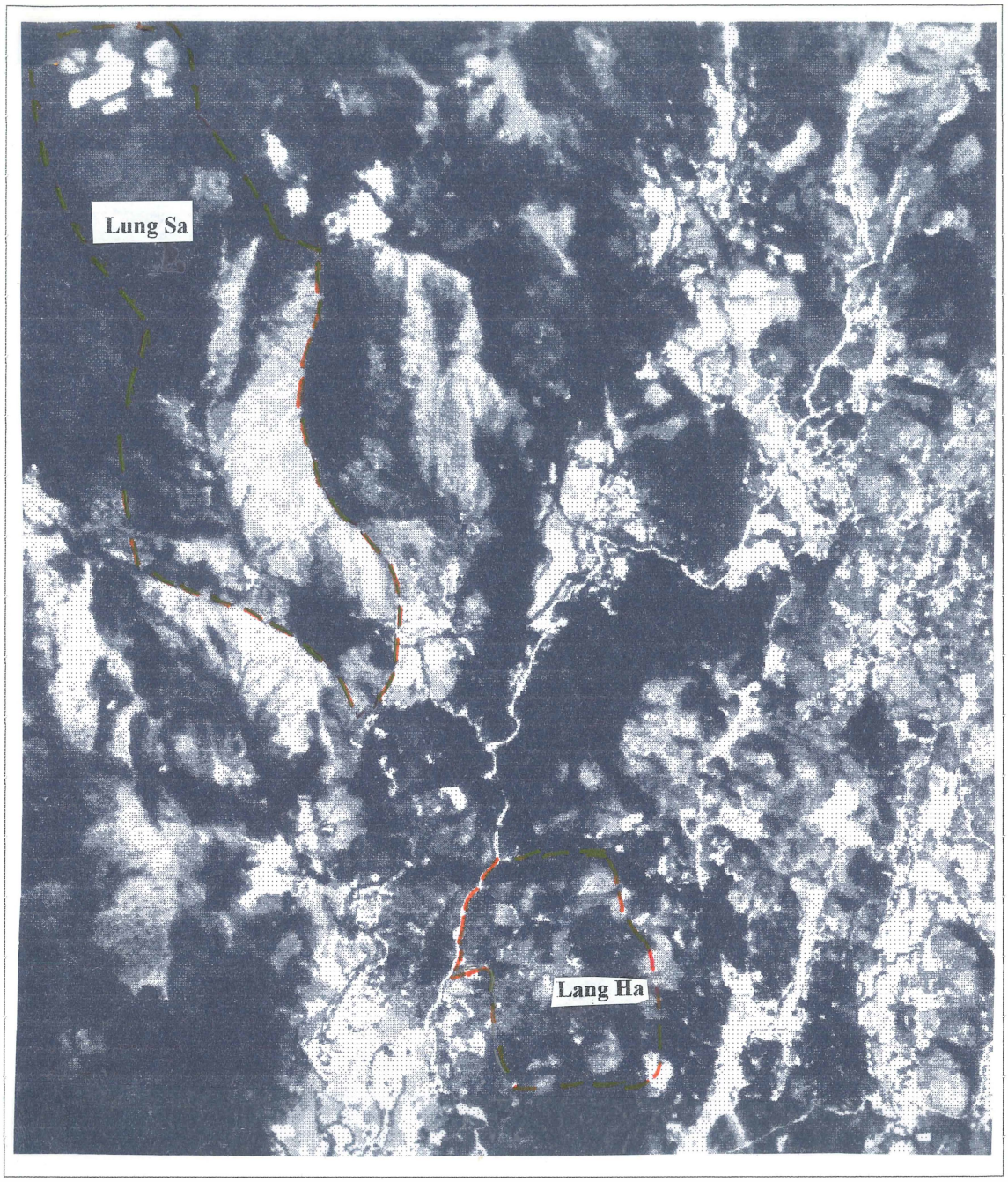


Fig 4.4: Satellite photo (Corona, US satellite) dated 1968 showing the land use in Lang Ha and shifting cultivation in Lung Sa. Dark areas are forest and light areas cultivated or barren land. The fields in upper left corner from shifting cultivation in the remote part of Lung Sa.

According to the villagers of Lang Ha 1968 was the exact year when they returned to cultivate in Lung Sa again after several decades of absence from that area. The slope facing South-West in the "near" part of Lung Sa (with a growth of Imperata grass) was, barren and used for grazing in the 1960s as it is today.

By comparing the photos of 1968 and 1995 it is apparent that forest cover in Lung Sa and also other upland areas seen on the photo is much less now than 30 years ago and remaining forest is fragmented. (A photo interpretation indicates that the forest cover in Ban Lau Commune has decreased from around 70 % in 1968 to about 10 % today). In Lang Ha village one can also trace a reduced forest cover, esp. in the Eastern part.

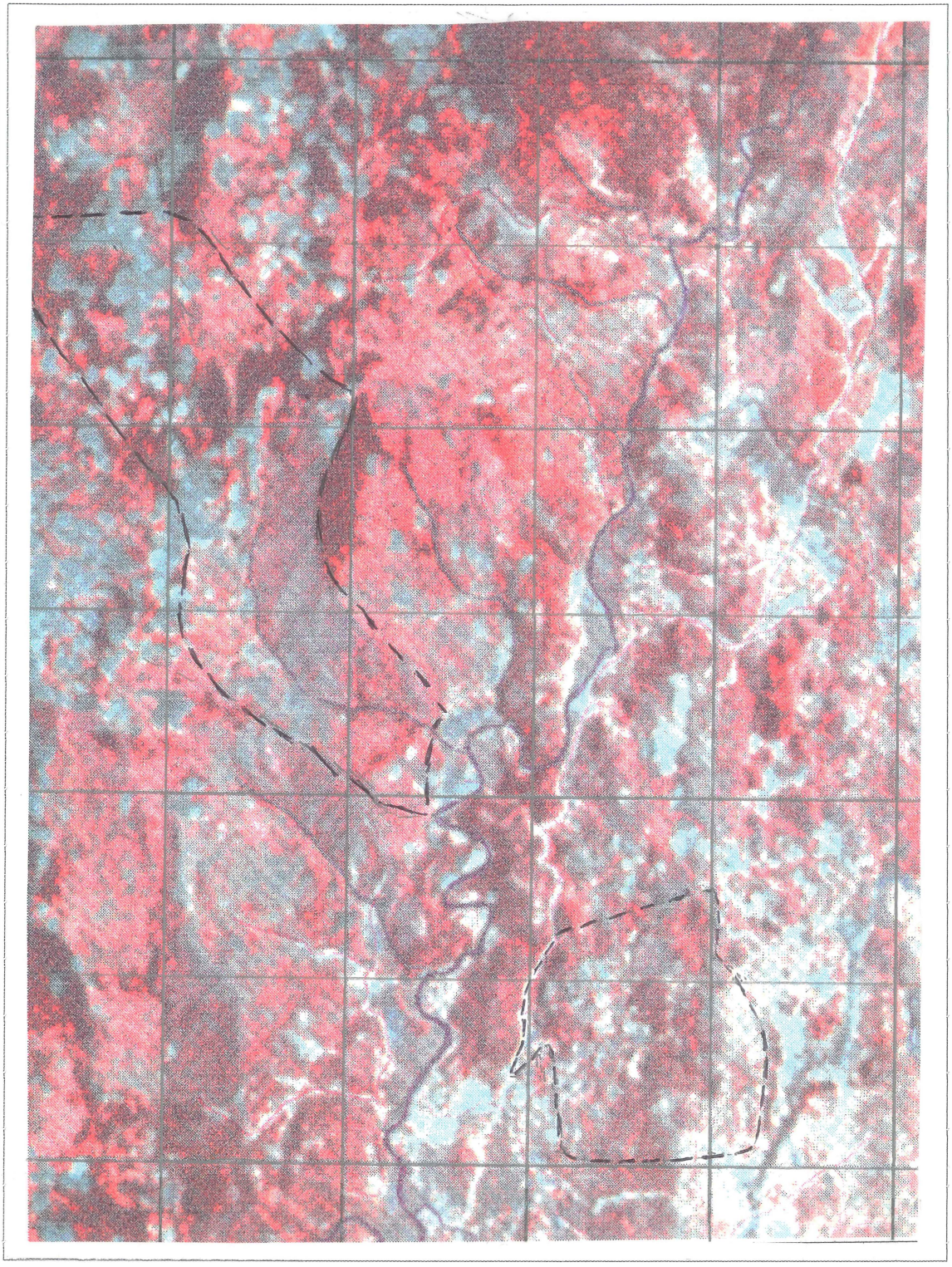


Fig 4.5: Satellite photo (SPOT) dated June 1995 showing the land use in Lang Ha Village and the shifting cultivation area in Lung Sa. Dark red colour indicates existing cover of old forest, light red colour fallow land or young forest, upland under cultivation is grey on the photo and paddy fields have a white of light blue colour

4.3 Introduction of new technologies

The villagers referred to three distinct periods in terms of general policy and government strategies.

The "Co-operative period" - the HTX - was from 1962 to 1983. The "Decree 10" period started in 1984 and was in 1994 replaced by the "Renovation".

During 1988 and 1989, the government did conduct a number of investigations and held meetings in the District and on the basis of those, the "Renovation" was eventually introduced. The Land Allocation, starting 1997 in Lang Ha, is viewed as part of the "Renovation".

The villagers expressed their experience of how the changes of policies had influenced the rice yields (Table 4.1)

Table 4.1: Illustration to changes in rice yield with regard to different policies as given by the villagers of Lang Ha during a meeting.

Name of the Period	Time	Yields of un-husked rice per 125 m2[1]
"HTX "	1962 – 1983	30 kg
"Decree No 10"	1984 – 1994	50 kg
"The Renovation"	1994 -	70 kg
"The Land Allocation"	1997	

The early to midst 1990´s is the period during which most new technologies reached the village and the villagers entered into new ventures such as fruit trees (Table 4.2). New and improved varieties of seeds for rice and also other crops were found elsewhere in Vietnam and sometimes purchased in China. The introduction of the electric power generators during 1992-94 was a minor revolution to the village as it provided light in the evening and also TV and radio. Rice of good quality from the shifting cultivation in Lung Sa was a major source of financing for this consumer goods. At the end of 1990´s, family planning was introduced.

Virtually all investments are either consumption goods or new technologies related to farming and land use. There are virtually no other new technologies introduced, e.g. rice mills, carpentry, blacksmiths etc.

[1] The 125 m2 refers to the 1 kg of seeds which covers an area of 125 m2.

Table 4:2: Introduction of new technologies and significant investments in Lang Ha Village, Ban Lau Commune

Item	Year					Comments
	pre 75	75 - 84	85 - 89	90 - 94	95 - 98	
Housing				X		From bamboo and hatched roof to wood house with tiles. Started in 1994. Presently 34 such new houses.
Mosquito nets				X		In the 1980´s, some 30 cases annually. In 1997, none.
Boiling of drinking water			X			
TV				X		Thirteen 1998
Radio cassette			X			Nine 1998
Sewing machine			X			Two 1998
Electric generator				X		In 32 households presently. One house in the village attached to the national grid.
Car						None
Motorbike					X	One 1998
Bicycles			X			Five 1998
Permanent cultivation of upland inside village					X	Mainly fruit trees, estimated to total less than 10 ha, divided among 10 households.
Orchards around homestead				X		
Apricot				X		Adopted from Hoa Binh
Plum				X		Adopted from Bac Ha
Cinnamon				X		
Permanent cultivation of upland inside village					X	Mainly fruit trees but also bamboo grooves and forest land on contract with the DARD. (Only two households)
Improved varieties of seed, rice		(X)		X		Previously supplied by the Producer Co-operatives. Since 1994 purchased by the villagers. Virtually all households.
Ditto maize		(X)		X		As above. However, many farmers prefer traditional seeds as they grow well without chemical fertilisers.
Development of new paddy fields		X	X	X	X	From some 6 to 30 ha in 1998.

Table 4.2: Cont´d

Item	Year					Comments
	pre 75	75 - 84	85 - 89	90 - 94	95 - 98	
Commercial / chemical fertilisers		(X)		X		Supplied by the Producer Co-operative previously. Since 1990´s purchased by farmers. Presently used by 25 % of the farmers
Pesticides					X	Used by 10 % of the households.
Cadastral survey on paddy fields			X		X	
Threshing machine				X		One engine driven. There are a number of manually powered machines.
Rice mill				X		One engine powered.
Farm tractor						None
Fish ponds	X					38 presently. Most of them constructed since 1993
Family planning					X	

5. THE CURRENT LAND USE AND SOCIO-ECONOMIC SITUATION

5.1 Current land use within the village boundaries of Lang Ha.

As described in Section 6, when discussing commune planning and allocation of paddy fields, the current land use in Lang Ha has been studied by three different approaches:

1. Planning data available in the Commune
2. Discussions with the Village Leader
3. A separate sampling inventory

All the three approaches cover the land use within the official village boundaries while only the village discussions (including a field excursion to the area) allows any estimates of the total extent of the shifting cultivation in Lung Sa.

The Commune data (Table 5.1) are the official figures attached to the Master Plan (1997-2010) described in Section 6.4, and some additional information provided through the land allocation records (Red Book). The Master Plan data originate from reports by the village while the land allocation data have been preceded by measurements in the field by the Cadastral staff of the Commune. A village land use map was also produced by the Cadastral staff in relation to the land allocation work. (Figure 5.1)

Table 5.1: Existing land use in Lang Ha (1997) acc. to Commune data (Master Plan).

Land class	Area	Land use type	Area	Sub-type	Area
Agricultural land	47.9 ha	Annual plants	40.7 ha	Paddy 1 crop	4.7 ha
				Paddy 2 crops	1.5 ha
				Swidden	32.9 ha
				Other plants	1.6 ha
		Homegardens and orchards	4.2 ha	Homegardens	4.2 ha
		Perennial trees	2.8 ha	Perennial trees	2.8 ha
		Fish ponds	0.2 ha	Fish ponds	0.2 ha
Special use land	1.0 ha	Transport	1.0 ha	Roads	1.0 ha
Residential land	0.7 ha	House areas	0.7 ha	House areas	0.7 ha
Unused land	49.3 ha	Potential forest	46.8 ha	Potential forest	46.8 ha
		Streams, limestone	2.5 ha	Streams, limestone	2.5 ha
TOTAL	98.8 ha		98.8 ha		98. 8 ha

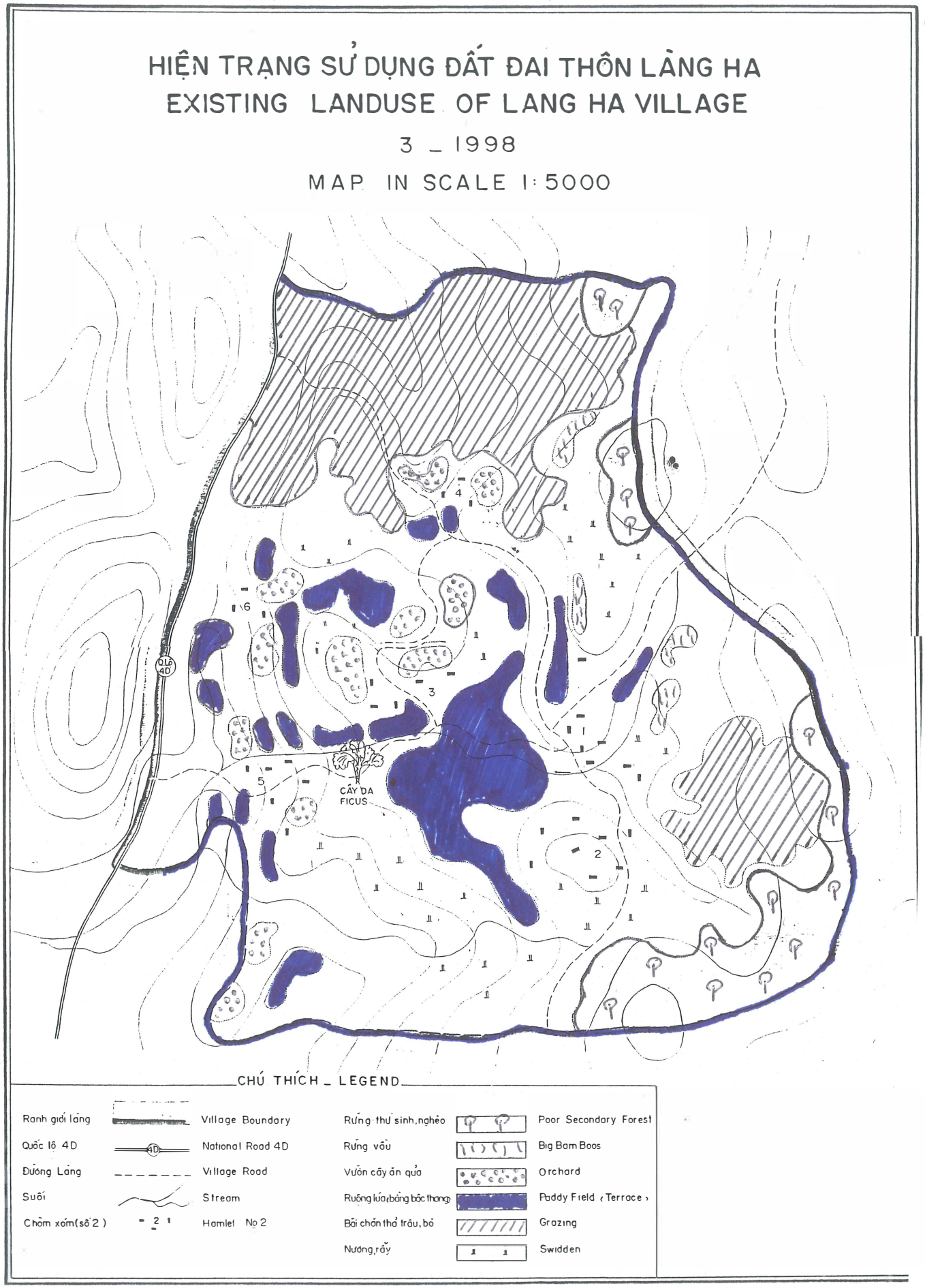


Figure 5.1: Map of current land use produced in relation to the land allocation.

The Village data are based upon discussions with the village leader (Table 5.2).

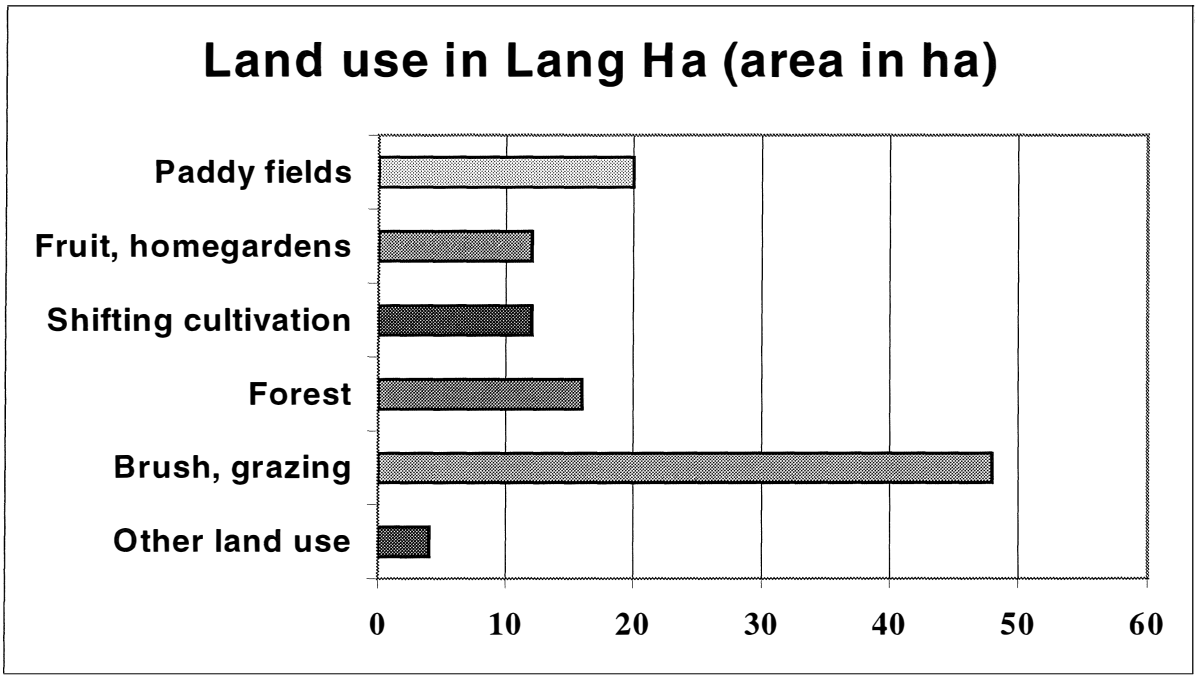
Table 5.2: Land use in Lang Ha village based upon discussion with the Village leader

Type of land use	Area, ha	Comments
Paddy, 1 crop	1.5	This terminology is not viewed as adequate by the village any longer. One or two annual crops is not field specific but rather relates to the operator.
Paddy, 2 crop	5.3	The total amounts to 6.8 ha
Slope land inside the village with permanent crops/fruit trees	< 20	Probably less, the Village leader indicates that only 10% of the slope land is being used. The area might be some 10 ha totally.
Slope land inside the village, not yet permanently used	>20	
Bamboo grooves	< 10	
Natural forest, mainly secondary	20	
Home gardens	2	
Upper water catchment areas	5	
Slope land outside the village	115	The shifting cultivation area in Lung Sa

The sampling inventory was carried out by an independent team in March 1998 and represents the year 1997 (as described in Section 3.2). Some results are summarised in Table 5.3 and Figure 5.2.

Table 5.3 and Figure 5.2: Land use in Lang Ha Village (inside village boundaries) according to the sampling inventory.

Type of land use	Area, ha	Standard error, ha	Comments
Paddy fields	20	5.7	Of which 20% 1-crop and 80% 2-crop. The estimate of allocated paddy is 8 ha.
Fruit orchards and home gardens	12	4.1	Mostly apricot, some longan fruit (often with vegetables underneath)
Shifting cultivation	12	4.1	Mostly maize, some cassava
Forest	16	4.6	Some 50% for protection of water catchment areas, the rest for forest production
Brush and grazing land	48	6.6	
Other land (housing)	4	2.5	
Total village area	112	-	
Total allocated area	40	6.4	



Comments to the different results:

A sampling inventory does not provide exact results but estimates. The standard error is a measure of the precision in the estimate. The calculation of standard error in Table 5.3 is based on the formula for standard error at Simple Random Sampling. The inventory in this study is a form of systematic sampling. There is no exact formula for estimating the standard error at systematic sampling but the standard error is normally smaller than the error at Simple Random Sampling.

The sampling inventory was carried out without measuring tape. After each sampling transect it was confirmed by measurement on the topographic map that the number of sampling plots along the line corresponded to what could be expected, but the method is rather coarse for an exact estimate of the total village area. The estimate of 112 ha is therefore not so exact.

The area of paddy fields in Lang Ha is estimated at 20 ha. The true figure could very well be 22 ha or 17 but we can be quite convinced that it is significantly higher than 5.5 or 6.8 ha. The estimate of allocated paddy fields is 8 ha and non-allocated paddy 12 ha. In other words, only a minor part of the paddy seem to have been allocated.

Except for the absence of non-allocated paddy, the village information matches the sampling data reasonably well. When the sampling data were presented to the village they also confirmed that the sampling result, incl paddy estimates, could possibly be realistic and that many fields have not yet been allocated. The main reason why the villagers had not put them forward to be registered was that the villagers were uncertain about the consequences of the land allocation in terms of tax payment etc.

When it comes to the Commune data they are captured and classified according to national standards established by the General Department of Land Administration (ref. 8)

Both the Commune data and the village interview data originate from village information and quite naturally there is a resemblance between those two data sets.

Photo 5: Most paddy fields in Lang Ha developed after 1960 are not yet allocated.

Photo 6: The pattern of the shifting cultivation in the remote part of Lung Sa is well managed and the landscape resembles that of permanent agriculture

5.2 The shifting cultivation in the Lung Sa

The activity in the Lung Sa is important for Lang Ha village and has existed for generations almost entirely outside government plans. Because there seem to be many similar cases as Lung Sa in other villages this part will be given some extra attention.

The area of Lung Sa:

All data provided are based upon information obtained from the village. The shifting cultivation in Lung Sa has not been subject to any survey or sampling inventory. The village reported that currently 23 households of Lang Ha are operating in Lung Sa and that the average size of holding is 5-7 ha. In addition some 36 households of another village are also reported to cultivate land in the valley. During a field visit together with some of the villagers, the area has been studied and discussed from a hillside viewing point and also approximately identified on a map. Some of the young households who have recently come into the area have explained that they have about 2 hectares. Based on this information the researchers suggest that some 23 x 5 = 115 ha might be in use for cultivation

Lung Sa includes two adjacent watersheds. The "remote" North-Western valley and the South-Eastern part (see map). The upper part of the South-Eastern valley has more recently been taken into use. The "old" households of Lang Ha have mainly used the remote valley, while it seems as Coc Tru village have used the South-Eastern valley.

The history of Lung Sa:

As mentioned in the historical section, the Dzao group of the Lang Ha community initially lived in Lung Sa. They later moved to the current village site and took over (bought) the paddy fields at that time when another ethnic group moved out some 60-70 years ago. At that time they abandoned Lung Sa as their agriculture area and did not return until 1968 (see section 4.1).

The villagers mentioned that many of them returned to Lung Sa in the early 1980:s. At that time the population increased dramatically by immigration. There was also a need for reconstruction after the border war in 1979, and they claim that the land use in Lung Sa was partly for that purpose.

In the South-Eastern part of Lung Sa commercial logging took place during the 1960s and 1970s by a State Forest Enterprise in the area. It is unclear exactly when it was stopped. Large areas in that part are also used for grazing and burnt systematically. Those slopes were barren already in the 1960s and possibly long before that. In the remote part the researcher could see no signs of logging.

The agricultural systems applied in Lung Sa:

The experience of the field visit to Lung Sa jointly with the villagers and some old photos suggest that there is a long tradition of shifting cultivation in Lung Sa by the villagers. The landscape in the remote part of Lung Sa resembles an agriculture landscape with well defined holdings and systems for crop rotation.

In the following a reconstruction of one of those holdings in the remote part of Lung Sa is described and illustrated. On the photo (No 6) taken on the misty day of the field visit a view of the area is observed. On the aerial photo dated 1968 (fig 4.4), the cultivation of the same area at that time is clearly seen

One household would have some 5 - 7 ha, split up on some 6 plots. The lower field is used for rice, the next for maize. A corner for cassava, a middle field again for maize. The top field is actually an area of forest - water catchment forest, kept and maintained to provide that service.

All fields were located in strips from the bottom of the valley towards the top. That is, all operators had virtually all types of slope and land qualities in their land.

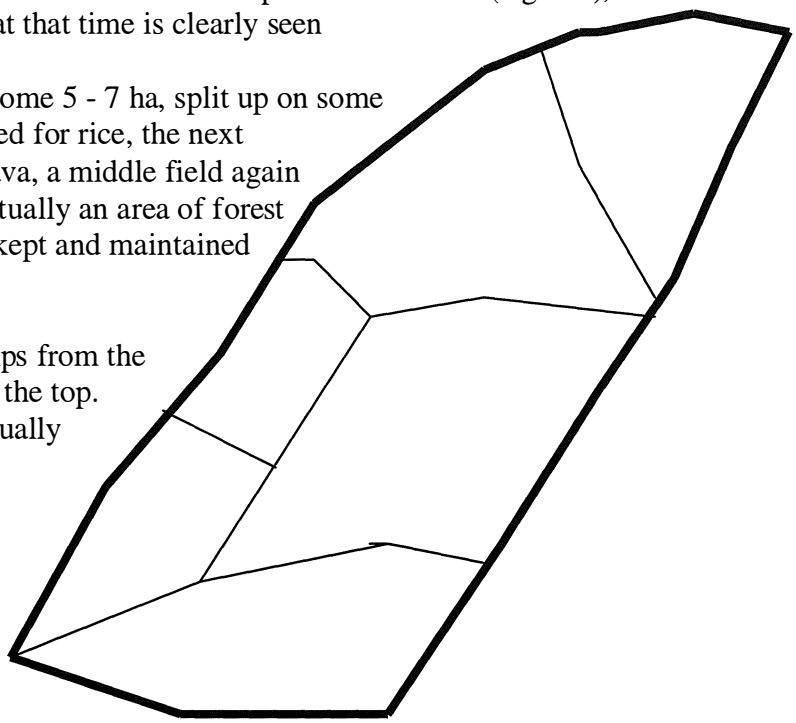


Figure 5.3: Illustration of the distribution of plots within the holding of one household on a hill slope in Lung Sa

All land rights to these fields are based upon local, village tradition and is not reflected in any official documents. However, in the Land Allocation, some land in Lung Sa is actually included by a few households (Annex C, "Upland, outside"). In Lang Ha, only the Dzao households currently cultivate in Lung Sa. There are no Kinh households.

The cropping pattern is described as one household having some 5 - 7 plots, located as in the sketch above (fig 5.3). The major crops are rice (both sticky and plain), maize and cassava. Rice is cultivated for three consecutive years if possible and replaced by cassava. After some 5-7 years of fallow, the operator returns to the field with rice. In general, traditional maize varieties are used as they do perform reasonably well without fertilisers. There are two kinds of traditional maize, one requiring plowing with buffalo and cultivation for 1- 4 years and return after 4 - 5 years. The other variety can grow without plowing for up to 3 years with a return after 6 + years of fallow.

It has been possible to identify two different types of land use of the Lung Sa area in the Lang Ha village. One is a permanent system with specific ownership, clearly visible on the ground and with elaborated fallowing and growth cycles. This system encompasses for each household some 25 ha and is maintained by villagers who are well off. The other system, operated by the poorer strata of the village, is using smaller units - some 2 ha was reported - with no fallowing but rather a continuous cultivation and declining yields. There is also an important difference between the two different types of operator with regard to destination of the crops - the well off are using the Lung Sa for cash crops whilst the poor strata is mainly using Lung Sa for subsistence.

Some yield figures from Lung Sa are exposed in table 5.4.

Table 5.4: Yield figures from Lung Sa

	Yield			
Crop	Year 1	Year 2	Year 3	Comments
Plain rice	1.4	0.8	0.3	tons, unhusked
Maize	1.2	1.1	0.8	tons

The households cultivating in Lung Sa and their economy:

Some five families in Lang Ha have actually stopped shifting cultivation Lung Sa and rather focus on paddy fields and inside slope land cultivation. Nevertheless, the number of Lang Ha households cultivating in Lung Sa had increased from 18 in 1990 to 23 in 1998.

Among those 23 households, there are poor households and those who are better off. Seven of the 8 households of Lang Ha classified as "marginal" (most of them young households) also cultivate in Lung Sa. 16 households are "better off". The poor use a higher rate of their production in Lung Sa for subsistence (table 5.5), but in general most of the products are directly (rice, maise) or indirectly (pigs) for the market.

Table 5.5: Use of the production in Lung Sa by different socio-economic groups (strata) of the village.

	Subsistence	**For the market**
Poor and average strata, "not having enough food"	20 - 30 %	80 - 70 %
Well off and average "with enough to eat"	10 %	90 %

The households that are "well off" use the Lung Sa area for generating cash for consumption, including conspicuous consumption (weddings, special occasions).

Today, the group estimated that some 50 % of the rice area was for sticky rice and the rest for plain rice. Sticky rice is used for subsistence, self consumption such as sweets and special dishes. The plain rice is viewed as a quality produce, fetching a good price. Prices were quoted around 1 million VND per ton unhusked plain rice. It was pointed out that if there was a need for larger sums, a buffalo or pigs would rather be sold. The Lung Sa maize is mainly used for feeding pigs. One pig would fetch some 700,000 VND; a buffalo some 2 - 3 million VND. Most households aimed at selling 2 pigs and ½ buffalo per annum. (Producing 4 pigs, selling 50 %)

Some Lang Ha villagers have claimed land in Lung Sa in the Red Book. The Land Allocation Working Group was on its way to Lung Sa but never reached the upper part of the area and the remote North-western core-area, probably because of rain.

The future of Lung Sa

In connection with the land allocation, people did not want to claim land in Lung Sa in general. Reasons - the operations are more or less illegal, they do not want to pay tax; and its is viewed as an interim activity, eventually to stop. Some farmers also claim that Lung Sa is not profitable any more, it is not worth the trouble. The land is still productive but development opportunities of land inside the village are larger than in Lung Sa. The distance and lack of road prohibits manure / fertilisers e.g. and transport of produce out of the area is also difficult.

In general, an ocular inspection of the remote valley shows a well looking valley with mixed cultivation on the slopes. There are no obvious traces of erosion and in effect, the impression is that of a well organised and possibly even sustainable land use.

On the other hand outside that area the research team passed by another area more recently opened up and more intensively used by farmers who were not so well off. One of them claimed to have used the same spot for 15 years with little interruption and continuously decreasing yields.

Apart from Lung Sa, there are at least two more areas in Ban Lau Commune which are used in a similar manner - the Si To and the Lung Den areas. The situation could be described as commercial shifting cultivation, carried out by well off people living in villages along the road. The right to cultivate is very likely associated with status and influence - poor people living nearby are not allowed to use the area. The area is mainly used for generating cash for consumption. The operations are not commercialised in the sense that modern equipment and inputs are used. That is, the Lung Sa is the victim of consumerism without benefiting from the market in terms of inputs.

“Swidden agriculture” can be defined as an agriculture system in which the cultivation period is shorter than the fallow period (ref 2,). For vast areas in Ban Lau Commune including the South-Eastern part of Lung Sa the cultivation is now so intensive that the above definition might not be valid. About 60 % of the western Na Loc part of the Commune was used for cultivation in 1996 (ref. 10)

5.3 Socio economic stratification and outcome of land allocation in Lang Ha

Social stratification

The village used four (4) categories for socio economic stratification as indicated in the table 5.6. The main reason quoted for being poor was "too many children", lack of skills and ignorance. The average household size is 5.34 persons.

Table 5.6: Socio economic stratification used by the village

Socio economic strata	No of households	%
Wealthy, income from outside	2	4
Well off, skilled, good farmers	4	10
Average	27	66
Marginal	8	20

Concerning the land allocation, 39 households are included so far (Annex C). There are another two households which has recently emerged (newly married couples) which not yet have been allocated land.

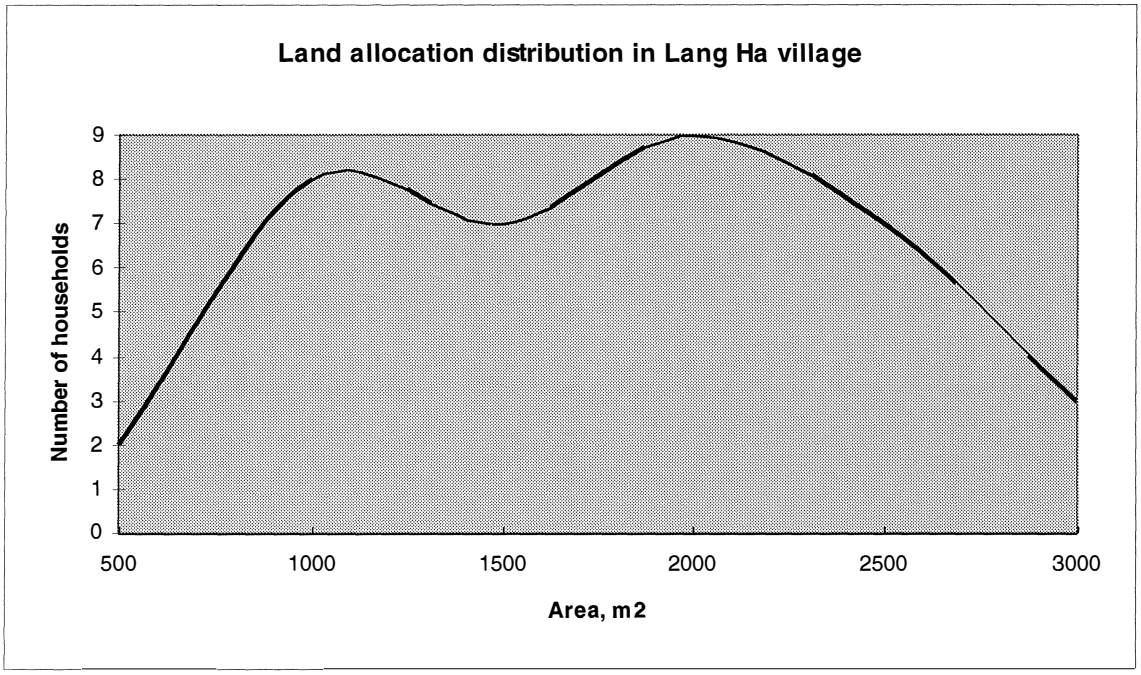


Figure 5.4: The size of allocated land among the households in Lang Ha village

There are three households which have not been allocated any paddy fields inside the village. The total amount allocated is 55,106 m2 in 229 plots. The average area per household is 1,413 m2 and some 6 plots. The minimum land area allocated is 782 m2 and maximum 2,787 m2 with the largest area being almost 3 times the smallest area. The standard deviation is 686, m2 which indicates that the 2/3 of the households have between 730 m2 and 2,100 m2 (Figure 5.4).

It is not possible to have any opinions from this about the equity of total distribution of paddy fields in Lang Ha village as the distribution of some 15 ha is not known. Case studies indicated though that, for instance, new households had been allocated land in connection with the establishments of their household.

An analysis of the socio-economic stratification in the village remains be done. It would possibly show that the assets of the interest such as land is equitable distributed in the village - virtually all have access to paddy fields and also other fields whilst there are differences based upon outlook, skills and non-material factors.

The land allocation is difficult to use as an indicator of access to land as it only concerns a small part of all land in the village. Still, the land allocation is an opportunity for anybody to come forward and get his or her 220 m2 of paddy field per person in the family and, with a few exceptions, this appears also to have happened.

5.4 Agriculture production and other economic activities in Lang Ha

As indicated in the Table 5.7 below, the Lang Ha village is very much an agricultural based village. Agriculture, animal husbandry, poultry and fishponds are the mainstay of the economy of the village. As one of the villagers said: "everything you see in my house comes from the agriculture/the land" There are virtually no non-agriculture activities to generate cash incomes. The major cash sources are pigs and the shifting cultivation rice from Lung Sa.

Discussions with the villagers indicate that the major strategy for village economic development is to develop agriculture - introduce commercial fertilizers, better irrigation and tow paddy crops and high yielding seed varieties. These items are present in the village but only some 25 % of the villagers - mainly the immigrant Kinh people - apply all of these methods. The lack of economic diversification is surprising, considering the location of the village nearby - some 2 km - the commune centre and also the road.

Table 5.7: Some production data on Lang Ha village (village based data)

Activity/item	No of households	Commercial / Subsistence	Comments
Vegetable gardens	34	S	
Large animals except buffaloes	22	partly	
Ruminants	2	C, some 5 million VDN/a/hh	
Buffalo	34	67 totally	
Pigs	38	C 50 %	6,000 VDN per kg selling price
Horses	8	C/S	12
Fishponds	34	S	
Poultry	38	S/C	350,000 VDN/a
Economic activities, generating cash income			
Service, trade	0	0	
Handicraft	0	0	
Home industry	1	1	Rice mill
Employment	1	1	Commune Chairman
Enterprise	1	1	
Migratory work	0	0	
Timber/poles	41	S	
Firewood	41	S	
Non wood produce	34	2 for C	1 million VDN/a

Alcohol is being produced in the village. Dealers from Ha Noi actually approach the village and pay advance for apricots. The village is very much a farming community with very limited economic diversification.

Table 5.8: How the products are used in Lang Ha

Item	Use
Apricot, green beans, peanuts, mango, soya bean, chicken, egg, fish	Apart from subsistence also used for financing minor purchases
Pig, cow, buffalo, horse	To finance fertiliser, special events, major purchases such as electric generator, TV etc.

Apart from the above, a major source of cash for consumption is the Lung Sa produced rice which is viewed as a very high quality rice, fetching a high price.

5.5 Profile of individual households

Each of the four households, described in this part, represents each of the socio-economic strata in Làng Ha. These households are respectively ranked; the wealthy, the well-off, the average, and the marginal households. They are mentioned by the serial numbers used when interviewed.

Household No. 2

This is one of the only two wealthy households in the village. It is a family with a mixed-marriage-couple. The husband is Dzao and the wife is Kinh. He was born at this village and is among those of the third generation, descending from the first group of the settlers. She originates from Hài Phong Province, the low-land area. They met each other in her home town, where he worked as a police officer. She came to the village in 1983, just after they married.

They have four children, two daughters aged 17 and 16 years old and two sons aged 12 and 10 years old. Since the oldest daughter is studying at a boarding school in the centre of Muong Khuong District, she cannot help the parents in agricultural activities. Therefore, only two labours are available in the household. However, some times, when the second daughter is free from school, she can assist the parents in doing light work in paddy cultivation.

Living conditions

The family is living in a 3-module house with tile roof and mud-floor, inherited from his parents. Other asset are; threshing machine, plough, hydroelectric generator, television, video equipment, and electric fan.

Land use

It is no doubt that the first settlers had most opportunity to clear forest land and to have control over the best pieces of village land. Being offspring of those settlers, the husband in this family has inherited many plots of his ancestors. Followings are specifications of the plots owned by the family.

1) An area about 500 m2 for home garden, planting vegetable for household consumption, inherited together with the house (the area is named A on the sketch map, figure 5.5a).

2) Four plots of privately developed paddy fields and two allotted plots. All together, the total area is about 1,980 m2. Total yield in 1997 was about 2 tons, out of which 70% was for sale and 30% for household consumption (B,C,D,E,F,G).

3) An orchard about 720 m2, planting apricot, plum, lychee, and longan. It is only 2 years old (H).

4) A plot of slope land about 3 ha, dividing into three parts; 1 ha. for apricot, 1 ha. for bamboo plantation, and 1 ha. is still left fallow. The plot is inherited from his parents (I).

5) A fish pond about 120 m2 for household consumption. (J)

6) A plot of slope land outside the boundary of the village in the north direction and about 1 km. away. This plot was exploited by the household itself. Currently, it is left fallow. (K)

7) A plot of 2 ha. in Lùng Sà. The first half of the plot (1 ha) is planted with bamboo. The second half (1 ha) is divided into two parts, 0.5 ha. is planted with cassava for animal feeding, and 0.5 ha is maize - 50% for sale and 50% for household consumption. In 1997, the yield of cassava, as well as that of maize was 1 ton in dry weight, (L)

Livestock

The household has two buffaloes for working in the paddy fields and for transporting the products. It also has three pigs and about 50 poultry.

Economic status

Main income is from paddy rice and pigs. Usually, the household sells two pigs per year. The price for 1 kg unhusked rice is 1,300 VND, and 1 kg pig is about 10,000 VND. The household has no debt.

Perception of the future

The couple is not sure about the tenure of the allotted plots of land, although they are pleased at the land allocation. They also realise that some day in the future the government may suppress activities in Lùng Sà. Therefore, they have started investing in fruit orchards and bamboo plantation. In addition, they plan to develop fish pond management and animal husbandry.

Household No. 4

The household is a Kinh family. It represents a well-off household. Both the husband and the wife moved from Thaí Bình to the village of Làng Ha in 1975 with their respective parents. At the time, he was 9 and she was 7 years old. They married in 1987. The household consists of six members, the couple themselves, their three sons aged 11, 9, 6, and the mother of the husband. The couple alone is labour of the household. Nonetheless, whenever the two elder sons are free from school, and in spite of their young age, they often assist the parents in doing some simple tasks, such as, fetching fodder for the buffalo and feeding poultry.

Living conditions

The family lives in a 3-module house, which the husband inherited from his parents. The house has a tile roof and cement floor. Other asset the household owns are, hydroelectric generator, television, video equipment, and electric fan. They also have a plough inherited from the parents of the husband.

Land use

The household has various plots of land.

1) An area of a 2-ha orchard around the house, which is inherited together with the house from the parents of the husband. It is composed of apricot, plum, apple, longan, and lychee. In 1997, only plum and apricot were sold, bringing income totally 1,650,000 VND to the household. The other fruit species are still too young to give fruits. (A)

2) Three plots of paddy field, total area about 3,000 m2, were allotted. Total yield of 1997 was about 2 tons. Most of the yield (75%) was for household consumption, and the rest was for commercial purpose (B,C,D).

3) A slope land of 3 ha, inherited from the parents of the husband, consists of two parts. The first part of the area (1.5 ha) is divided into three patches, planted with apricot, plum, and cassava in respective patches. Both apricot and plum were planted in 1997. The second part (1.5 ha) is a fallow land about 1 ha, and the rest (about 0.5 ha) is covered with scattered natural bamboo. (E)

4) A 120-m2 plot of home garden with various species of vegetable for solely household consumption. This plot is also inherited from the parents of the husband. (F)

5) A fish pond of about 120 m2 is for household consumption, so far. It is included in the area of allotted paddy fields. (G)

All plots of their land are within the village boundary, and they do not have any plot outside the village.

Livestock

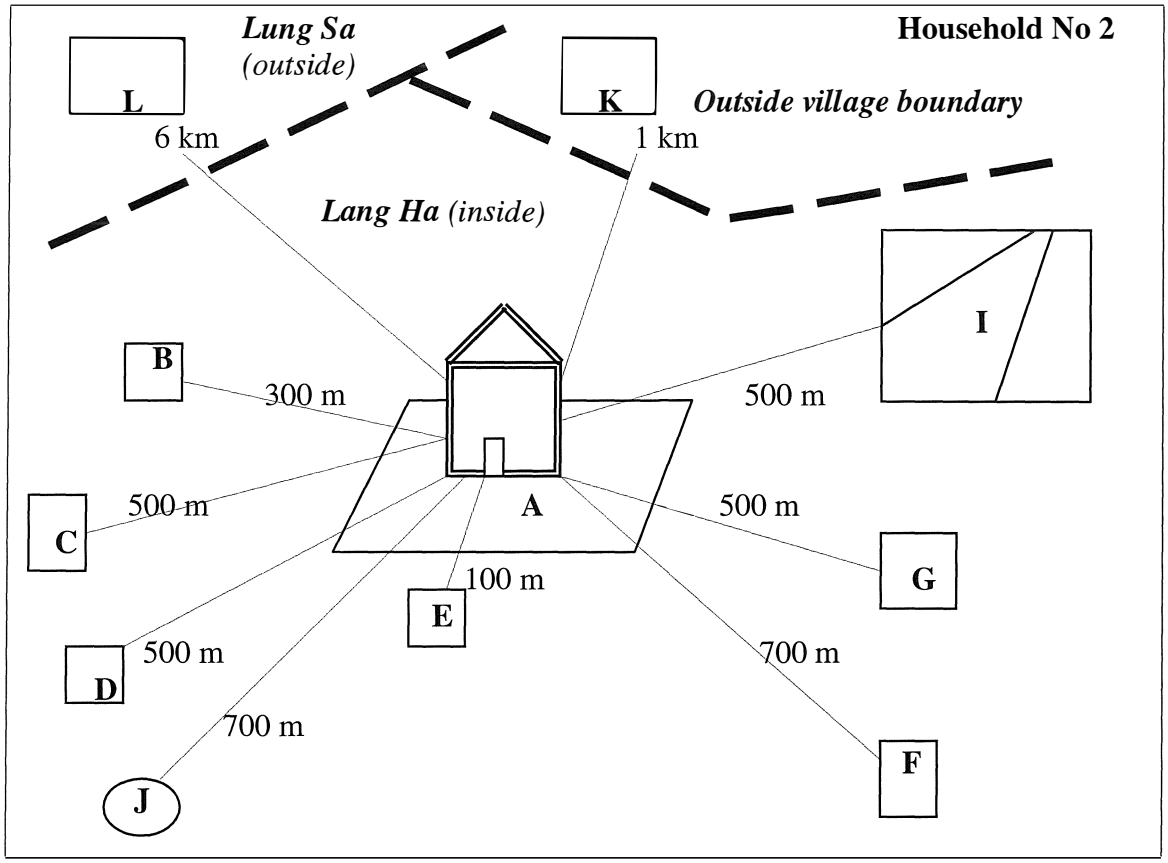
Besides a buffalo, inherited from his parents, they have 2 pigs and about 5-10 poultry.

Economic Status

The main income is from selling rice, fruits, and pigs. During 1995-1997, they had saved 15,000,000 VND and used the money for paying off the debt, renovating the floor of the house, and buying electric fan, television and video equipment. Now, they are free from debt and hope to save about 6-7 million VND per year onwards, as far as both of them are healthy enough to work as hard as usual.

Perception of the future

Although both of the couple do not feel any special hardship of the current condition of their household, they are not sure of the daily dynamic situation. The tenure of the allotted plots may or may not be long enough for their lives and their children's future. Therefore, they plan to intensify fruit orchard around the house and plant fast growing trees on the fallow slope, which is the property they inherited from their ancestors. In addition, they will develop fish pond and animal husbandry.



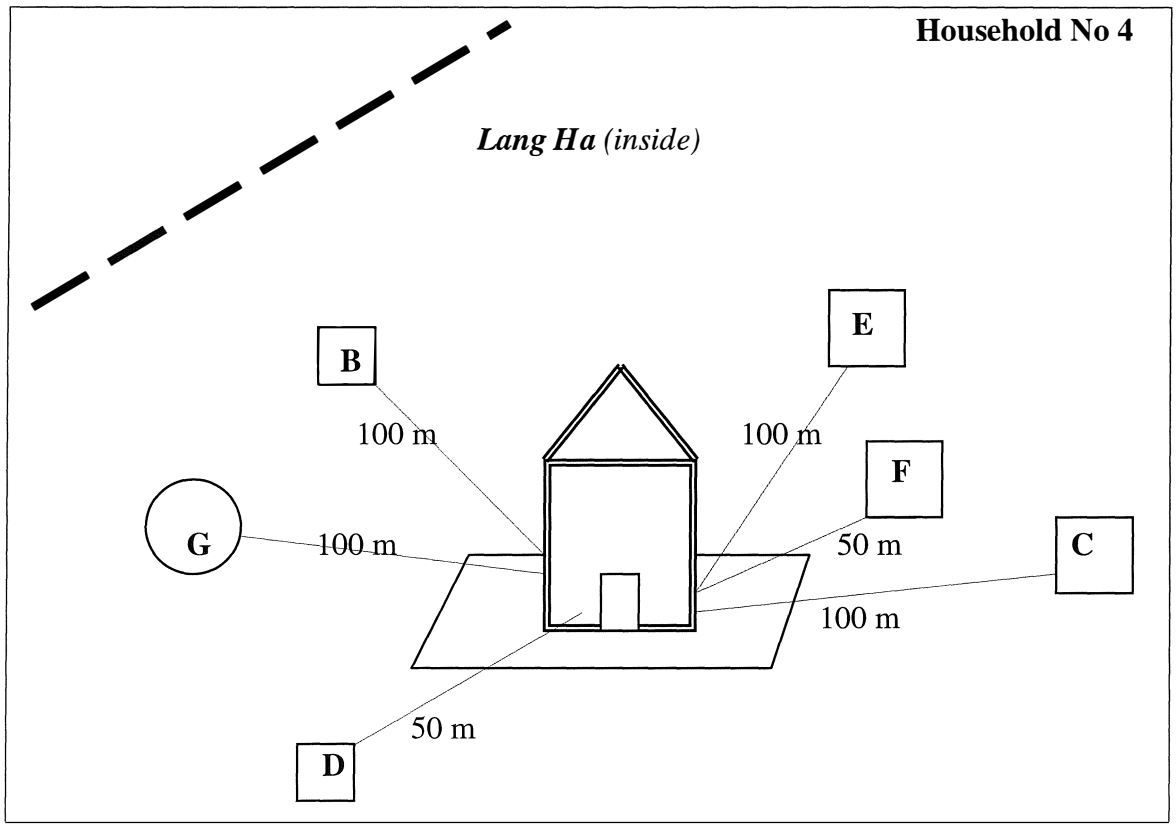
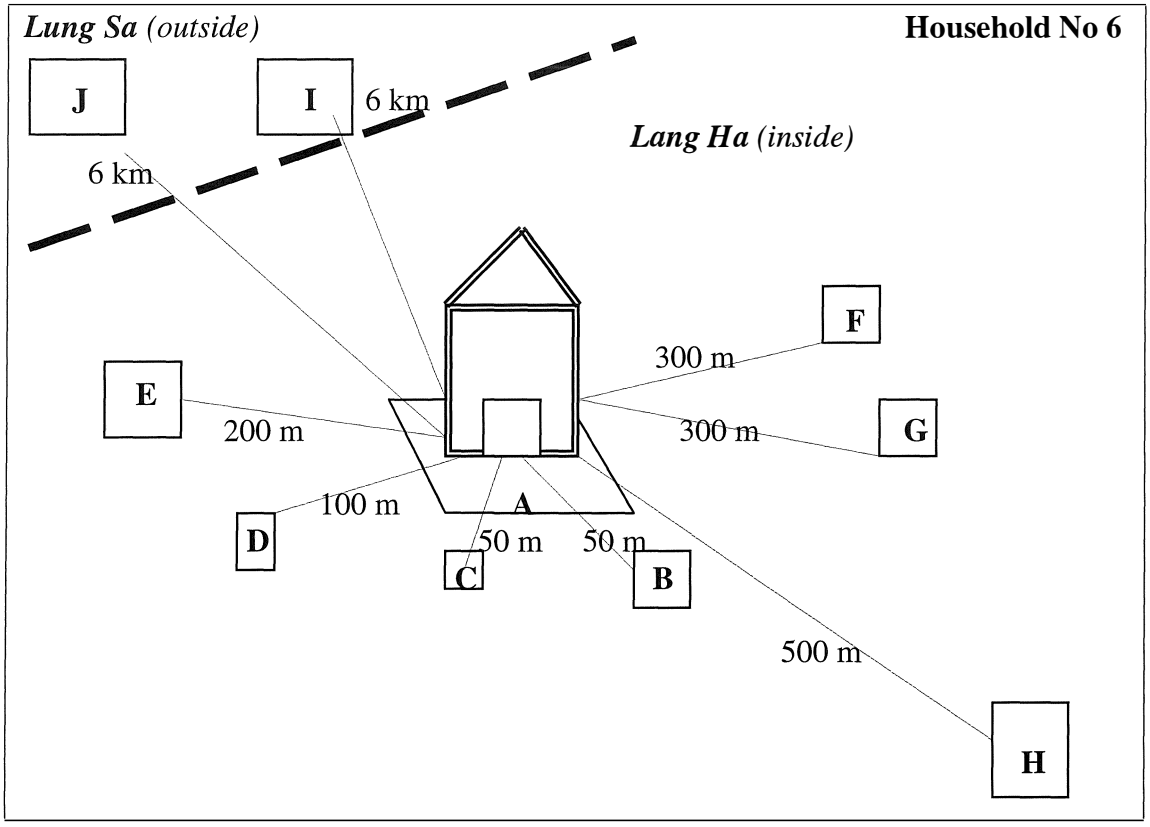


Figure 5.5a: Sketch maps of the plots of the households no 2 and no 4



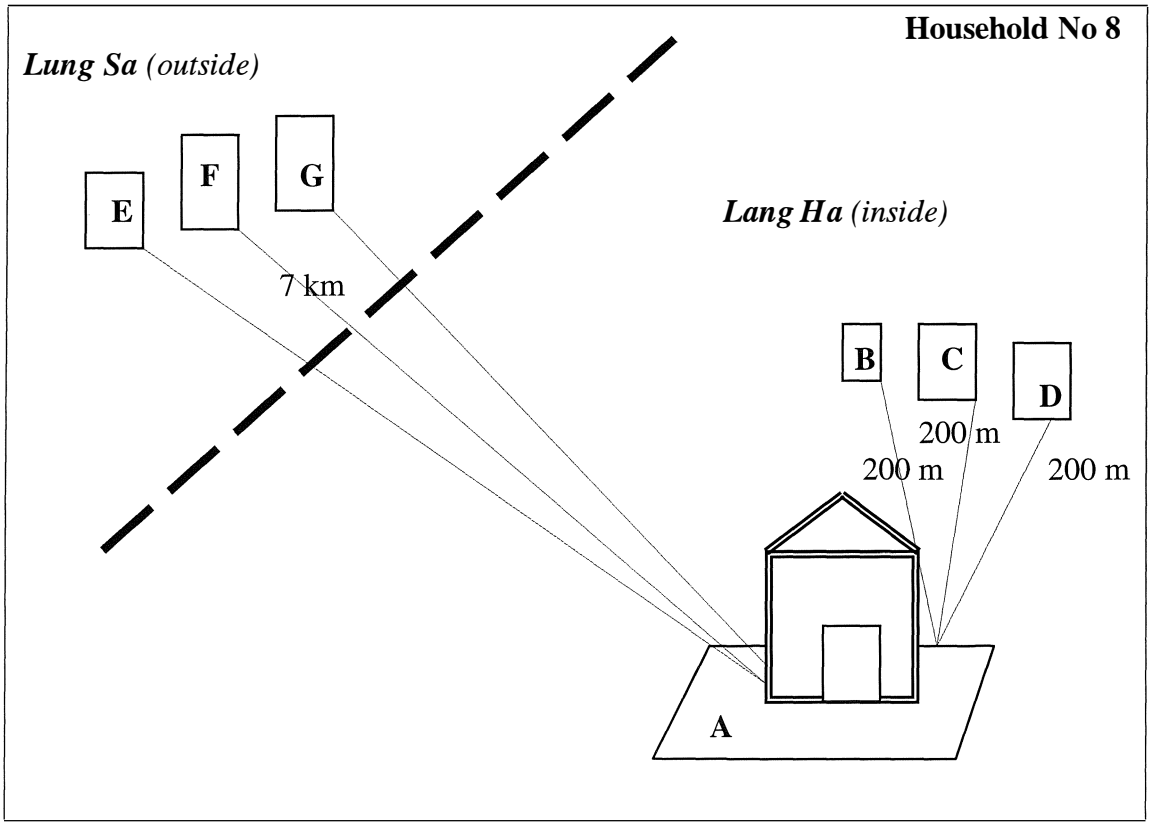


Figure 5.5 b: Sketch maps of the plots of the households no 6 and no 8

Household No. 6.

This household is a nuclear family. It is one of the "average households". Both of the couple are of Dzao ethnic group. They are both 30 years old and have two sons, aged 7 and 4 years old. The wife was born at this village and is one of those in third generation, descending from the first group of the settlers. The husband originates from Thái Bình Province and moved to Lang Ha when he married her in 1990. Since the children are still small, the couple is the only labours of the household.

Living conditions

They are living in a 3-module house with tile roof and mud-floor. It is a new house, which was built in 1995 by the couple themselves through a loan from the bank. Their old house is the current kitchen. In fact, the couple had saved enough money for the cost of the house, but their need of buffalo was the first priority, otherwise they could not have carried out the paddy field cultivation. The other asset they have is only a plough for use on agriculture land.

Land use

The household has agriculture land (in use and fallow) both inside and outside the village. Those plots are as follows::

1) A plot of home garden around the house with the area of 240 m2, is planted with 6 plum and 10 apricot trees. It is a private plot which the couple bought from a neighbour. (A)

2) Four plots of allotted paddy field, totally 960 m2 (B,C,D,E). The yield in 1997 was 800 kg. The entire product was sold, because the wife was ill throughout 1997.

3) Three plots of slope land of total area 2,240 m2, and all plots are inherited from the parents. The first plot of 800 m2 and the second plot of 240 have been left fallow since 1991, because the soil is very poor. The third plot is 1,200 m2 covered with natural bamboo-stand, which was sold only once in 1997 at the price of 3,000 VND a pole. Totally 100 poles were sold by then. (F,G,H)

4) Two other plots of slope land are in Lùng Sà, about 6 km. from the village. Both of the two slopes were exploited by the couple themselves in 1994 and 1997. The first one is 1,800 m2 and planted with sticky rice. The second one is a plot of 360 m2, and planted with plain rice. The couple said that the soil is still very good and they will further planting rice. (I,J)

Livestock

The household owns two buffaloes and some few poultry.

Economic status

The family still owes the bank the whole sum of 3,000,000 VND, the cost of their building house.

Perception of the future

Since the couple is still in the difficult economic situation, they cannot yet invest in developing the agricultural production, though they have many plans. However, they will try to keep the allotted land and develop it. They are also aware that sooner or later the government will eliminate the shifting cultivation in Lùng Sà. What will happen by then, they do not know. But, they were very pleased at the land allocation.

Household No. 8

This household represents the marginal stratum of the village. It is a nuclear family of a young couple of the Dzao ethnic group. The husband is about 30 years old and the wife seems to be under 20 years old. They have a 4-month-old little baby. In spite of that, the wife must help her husband as the second labour to carry out the agricultural production for their living.

Living conditions

The couple live in a thatch bamboo-hut with mud-floor, and there is no other asset.

Land Use

The couple carries out their agricultural production both within the boundary of the village and in Lùng Sà.

1) A small plot of home garden around the house, consisting of some kinds of vegetable for household consumption (A).

2) Three small allotted plots of the paddy field within the village boundary. Total area of the plots is about 1,000 m2. Total yield from all the plots in 1997 was about 600 kg (B,C,D)

3) Three small plots of upland cultivation with total area about 2,000 m2. The first plot was 1,000 m2 with sticky rice planted on one half of the plot and plain rice planted on the other half. The second plot was a cassava plot of 700 m2. The last plot was 300 m2, planting maize.(E,F,G)

These three upland plots in Lùng Sà have been used continuously since 1980 without being fertilised.

Livestock

No livestock is currently kept.

Economic status

The household has food deficiency every year. Shortage of rice occurs approximately 3-4 month per year.

Perception of the future

It is difficult for the couple to think and plan for the future. The husband seems to be depressed because of the difficult economic situation. The wife is very young and physically active, but she cannot be sure of expressing any opinion for the future.

General findings and observations:

Only the marginal households have shortage of rice (as an average during some 3-4 months per year). They compensate the shortage by eating maize and cassava. Some times they also sell animals to be able to buy rice.

The marginal households are generally young couples. Since most of them have small children who need to be taken care of, they have limited labour for field work. In addition, the land for shifting cultivation is not enough for them.

Concerning their plans for the future, the better-off households have many options. For instance, they invest in various alternative crops, animal husbandry and fisheries. The marginal households do not have such opportunities because of their limited resources of both land and labour.

All households interviewed are concerned about the tenure of the land. The parents want their children to have as high education as possible, but they also wish that some of the children would return and take over the land. However, in case none of the children wants to return to the village, the parents expressed their decision to remain in the village in order to maintain the tenure of the land.

The areas of paddy field mentioned in the interviews range from 0.1 - 0.3 ha per household. The areas co-incide with the registered (allocated) areas (fig 5.3). Those households having other non-registered paddy fields have not mentioned those fields during the household interviews.

In most of the interviewed households, either the husband or the wife derives from one of the two main clans in the village, one of each ethnic group. It is not quite clear to the research team if those clans are over represented among the interviewed households or if most of households in the village are kinship related.

It was observed that the men and the women in all the interviewed households share most activities (both agricultural works and household chores).

Regarding land allocation, both men and women expressed a positive attitude, but in different ways. All the men interviewed referred to ambitions expressed by the government to develop self-reliance of the local people. In the meantime, the women emphasised that the government had realised that the land would be most efficiently managed by the local people themselves.

6 THE COMMUNE AND THE PLANNING PROCESS

6.1 The Commune organization

Ban Lau Commune is located in the Muong Khuoung District of the Lao Cai Province. The Commune comprises 21 villages with a total population of 4,368 people in 844 households. The average household size is 5.2 persons. The largest ethnical group is the Kinh with 281 household and the H´mong, comprising 222 households. Other ethnical groups are Day 131, Nung 80, Dao 80, Phu La 4, Pha Di 12, H´an 3, Muong 2 and Tay 2 households respectively. (See Annex 1 for further demographic data.) The total land area is 5,430 ha.

The Commune center is in Ban Lau, a small rural town with post office, electricity, telephone, a market and some other facilities. Ban Lau is located along the Lau Cai - Muong Khuong road, some 26 km from Lao Cai town.

There are 23 elected Counselors, representing the population in the Commune, including the ten ethnic groups. The Counselors among themselves elect 7 persons who constitute the People's Committee and who also are the executive staff. They serve in the following capacities: Chairman, vice Chairman, Secretary, Financial/tax, Social activities, (Women's Association, Youth Association, Old People's Association, Farmers Association, Veterans Association and the National Front Association), Security and Frontier issues. The election period is five (5) years.

There are also six employed staff - Cadastral, Forester, Transport and Irrigation, Cultural and Social Affairs, Legal and Immigration and Agroforestry Extension. In addition, there are a number of part time employees such as staff for the ongoing land allocation, public health, fire brigade etc. The People's Committee and the above staff are all salaried by the Commune. The Commune pays 20 % of the salaries, the rest is received from the central government.

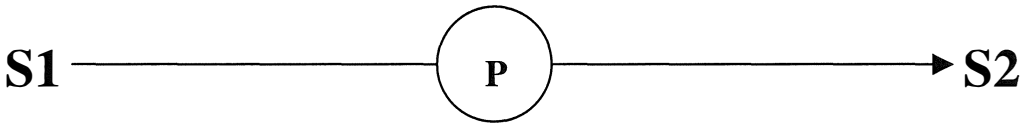
The government organisation extends to the villages. The elected village leader is paid by the government whilst the others - deputy village leader, secretary, leader of Women's Association) etc.) are not. They are, however, compensated by being partly excempt from the compulsory contribution to village work. (Out of some 25 man-days in Lang Ha, the WA leader had her duty reduced to 15 as compensation for the WA chairpersonship.

The Commune is responsible for the collection of taxes. One person from the Ministry of Finance, Department of Taxes, is based in the Commune. The Commune does also have one person assigned for taxation purposes. The taxes are based upon road use, the market and agricultural land and produce. Taxes collected are handed over to the District. The Commune makes an annual budget for various projects and activities, which are approved or not approved at District and other higher levels. The District can make their own decisions regarding proposals from the Commune, which are below 10 million VND. Otherwise, the District has to refer to the Province. The Commune does not collect any taxes of its own or have any "free" money of its own. All tax resources at the disposal of the Commune are derived from the budget, approved by higher levels.

Most of the Commune activities, such as the construction of a school, is carried out by village contribution, both in cash, kind and labor. This is *per se* a form of taxation. The Ban Lau Commune has ample physical facilities such as offices and a hall for public meetings. It has no vehicles except a motorcycle for the Commune Chairman.

6.2 The planning process

Planning in a simplistic view is a tool to achieve something desirable. It requires inputs, e.g. knowledge about the present situation, objectives, i.e. knowledge about what is expected to be achieved and also a process or strategy to make the desired objectives to be achieved. Basically, we have Situation 1 (S1) and want to proceed towards situation 2 (S2). In order to do so, we have devised a Process (P) which will enable this to happen. Below is indicated in schematic form the planning event.



The S1 would be a proper description of the current status, e.g. with regard to land use. The S2 would then be the desired result, what we want to achieve. It could, for instance, be an expansion from 100 ha to 125 ha. The P would then be strategy and process, describing how the result is to be achieved. It could, for instance, be activities such as land allocation, investments, education, extension, creation of markets and so on. If the objective is to build a bridge it is easy to define S1: No bridge. S2 likewise: A bridge. The Process would then be to obtain a budget, design a bridge, engage a contractor and so on. When the bridge is finished, we have achieved our S2.

The above is a very simple and straight forward case. Many practical situations, such as land use in Ban Lau Commune, are more complex. Do we use correct and current information to describe the S1? What is the strategy - how shall we go about - to achieve the S2 ? (e.g. expansion of paddy area)

6.3 Land allocation

Land Allocation (LA) has been carried out in Lang Ha village. The "Red Book", which is the document the proprietor receives, is presently in the District, signed by the District Chairman and waiting for approval by higher authorities. Since 1997, the Lang Ha villagers are using the land they have been issued through the LA. The research team has inspected the "Red Books" and a summary of the land allocated (see Annex 2).

In the Ban Lau Commune, the work with the land allocation started in 1996. A Council of Land Allocation was established, comprising 10 members with the Cadastral Officer of the Commune as the secretary. According to the prescribed proceedings, there must be three public hearings. The actual work was carried out by a Working Group, comprising specialists from the Province level and the Cadastral

Officer of the Commune. Along with it's standard routines, the Working Group initially visited the village and showed the data and maps they had on land use. In Lang Ha there were maps of paddy fields, which had been part of the Co-operative in the past. Villagers were informed about the land allocation and discussions were held.

During the second visit, the Working Group and the Land Allocation Council visited the village together. For each individual household, land to be included in the land allocation was identified and discussed with the concerned household. On this basis, the "Red Book" was drafted and submitted to "higher authorities", i.e. the District and the Province. The duration of the first village visit was around 20 days and the total time spent on the land allocation for the Lang Ha village amounted to some 2 months of fieldwork. During the fieldwork, only the nearest part of the Lung Sa was visited and not the main area with the fields going from the bottom of the valley to the top of the mountain.

The land actually allocated in Lang Ha village is some of the paddy land, the central part of the slope land (inside village boundaries) and some slope land in Lung Sa (outside village boundaries). Forest land (slope land) is allocated for a period of 50 years whilst paddy land for 20 years.

The criteria for land allocation differs from the ones used during the Decree 10 period. At that time, the number of labor in the family was decisive. Today, the amount of land being allocated is based on the number of household members. Each family member is entitled to 220 m2. Some 5 % of the paddy land is being kept by the Commune as spare land for future use. Meanwhile, it is being leased out to villagers.

Table 6.1: Summary of land allocation in Lang Ha village

Category	Area (ha)	No of "plots"
Paddy, inside village boundaries	5.5	229
Slope land, inside village boundaries	40.2	44
Total allocated area, inside village boundaries	45.5	273
Total allocated area, outside village (Lung Sa)	16.7	14
Grand total	62.0	287

The total area of allocated paddy fields amounts to 5.5 ha inside the village territory, divided into 229 plots (pieces of land) (Table 6.1). These plots are shared by 36 households, giving an average of 6 plots per household and an average land area per plot of 241 m2 (or 0.0241 ha). The average amount of paddy fields allocated to each household is 1,530 m2 which would be corresponding to 7 household members.

Out of the 41 households, there are five that have not received any paddy fields. Two of those are newly established households which eventually will receive paddy fields whilst the situation for the other three is unknown.

Inside the village, there are 44 plots of slope land allocated to 23 households, comprising 40.2 ha for permanent cultivation, i.e. fruit trees and "perennial crops".

Outside the village, 16.7 ha has been allocated to 8 households. These plots are located in Lung Sa and represent only a small part of that area.

As is indicated in table 6.2 and table 5.3, the total land area - paddy, slope land etc - by far exceeds the amount included in the land allocation process at this stage.

Table 6.2: Result of different methods to estimate the area of paddy fields in Lang Ha

Methodology	Estimated area, ha	Comments
Point sampling survey	20	Based upon the point sampling as described in Section 3.2.
Information by Village leader	6.8	Based upon discussions with the village leader and representatives from WA, YA etc. The 6.8 ha comprises 5.3 ha "1 crop land" and 1.5 ha "2 crop land". This distinction is not viewed as relevant by the village leaders as it mainly depends upon the operator whether it would be 1 or 2 crops per annum.
Land Allocation instrument, the Red Books	5.5	This is a summary based upon the official Red Book, signed by the District Chief on 20/9/97 but not yet officially approved

There is thus a substantial difference between the point sampling survey result (considered as the most complete data set by the authors) and the official information as received from the village leader and the land allocation documentation. The differences have historical reasons and can be viewed as part of the process of the land allocation.

In 1962 - 64, the co-operative movement reached the Lang Ha village. During that period, the major part of the paddy fields now included in the land allocation were developed. Over the years, more paddy fields were developed as the population grew It is claimed by the village leader that most of those fields were developed during the period of 1989 - 1997.

During what the villagers call the "Decree 10 period" the fields of the co-operative were eventually distributed among the users who could use them as their own but in reality leased them from the Commune. This lease eventually became a taxation system. When the co-operatives were disbanded, the privately developed fields

remained private and it appears that those fields by and large have been kept outside the land allocation.

During the land allocation, villagers basically claimed paddy fields nearby their houses. There are many reasons why they did not claim all the fields they used: reluctance to reveal to the authorities the property they have; tax evasion and finally, a general concern, based upon previous experiences: what does the land allocation really entails! This was emphasised by villagers: people were not sure about the intentions of the land allocation and thus decided to "play it safe". (The situation is similar in other villages of the Commune with the exception of the villages of Bo Qui and Nam Ninh as they are located in the "lowland" with old established paddy fields, virtually all located in the same area.)

There are other issues involved in the land allocation as well. It appears that there is a competition between the villagers living in the "high" part and those living in the "lower" part of the village concerning water. The "high" part of the village controls the water going down to the lower situated areas, and the amount of water is limited. Possibly, there is a potential conflict of interest involved in this. The research team did not pursue this issue.

The conclusion is that within the Lang Ha village there is around 20 ha of paddy fields, out of which some 5.5 ha has been included in the land allocation and the "Red Book". Of some 70 ha of slope land inside the village, some 40 ha has been allocated. In Lung Sa with an estimated area of more than 100 ha used for shifting cultivation by Lang Ha villagers, the land allocated amounts to 17 ha (fig 6.1).

The Commune and the Village refer to the next step of the land allocation, which eventually would include more land. "Step by step" appears to be the approach. From the villagers' point of view, the caution displayed is not surprising.

Certainly, if the land allocation is to promote "fixed cultivation" and investments in land, there is a need to allocate <u>all</u> land; to ensure that all land has a responsible operator who can venture on long-term use of that land.

<u>Land Allocation and household size</u>

Previously, land was allocated to households according to number of labourers available in the family. A labourer was defined as those above 15 with locally varying definitions of the upper age limit. The present ongoing land allocation is based upon number of household members. In Lang Ha village, the correlation between land actually allocated and household size is 0.84.

The land actually being allocated represent some 25 % of all paddy fields in the village. Also, some 1.3 ha of paddy fields have also been allocated in the "extra case" category which is land set aside as a reserve for the future. The allocation is temporary and the intentions are that this land will be used for new families and expanding families whenever required.

6.4 Planning for Lang Ha village and Ban Lau Commune

There are in Ban Lau Commune two major planning undertakings, which affect the Lang Ha village. One is the above-discussed Land Allocation. The other, which is related, is the "Project of Land Use Planning for the Period of 1997 - 2010", dated May 20, 1997. From that document are retrieved the figures presented in Table 6.3 (see also table 5.1) together with the Project Consolidated Data, which are based on the sampling inventory (see table 5.3).

Planning data for Lang Ha Village:

The Commune Planning Data uses 6.2 ha of paddy field in Lang Ha village as point of departure and aims for 7.5 ha whilst the total amount of paddy fields is presently estimated at 20 ha according to Project Consolidated Data. The amount of shifting cultivation inside the village differs considerably as well. The "not yet used - potential agroforestry land is probably the same as the brush, grazing land in the Project Consolidated Data category. In the Commune Planning for Lang Ha, the shifting cultivation area of Lung Sa is not included at all. It is the same at Commune level where the three areas of Lung Sa, Si To and Lung Deng are not included, although they are all intensively used for shifting cultivation.

Table 6.3: Planning and Project Consolidated data for 1997/98 and targets for 2010 for Lang Ha Village

Land		**Project Consolidated Data, ha**	**Commune Planning Data 1997/98, ha**	**Commune targets for 2010, ha**
Agriculture land		(44.0)	(47.9)	(71.3)
	Paddy	20	6.2	7.5
	Shifting cultivation	12	32.9	0
	Homegardens Orchards etc.	12	7.2	47.5
	Annual crops	-	1.6	16.5
Forest land		(64)	(49.3)	(21.1)
	Forest	16	0	21.1
	Brush, grazing	48	0	0
	Not yet used - potential agroforestry land	0	49.3	0
Other land		(4)	(1.7)	(6.9)
Total		112	98.9	98.9
Lung Sa	Shifting Cultivation	115	0	0

The portions of different land categories in Lang Ha, which are actually included in the planning process, are indicated in fig 6.1.

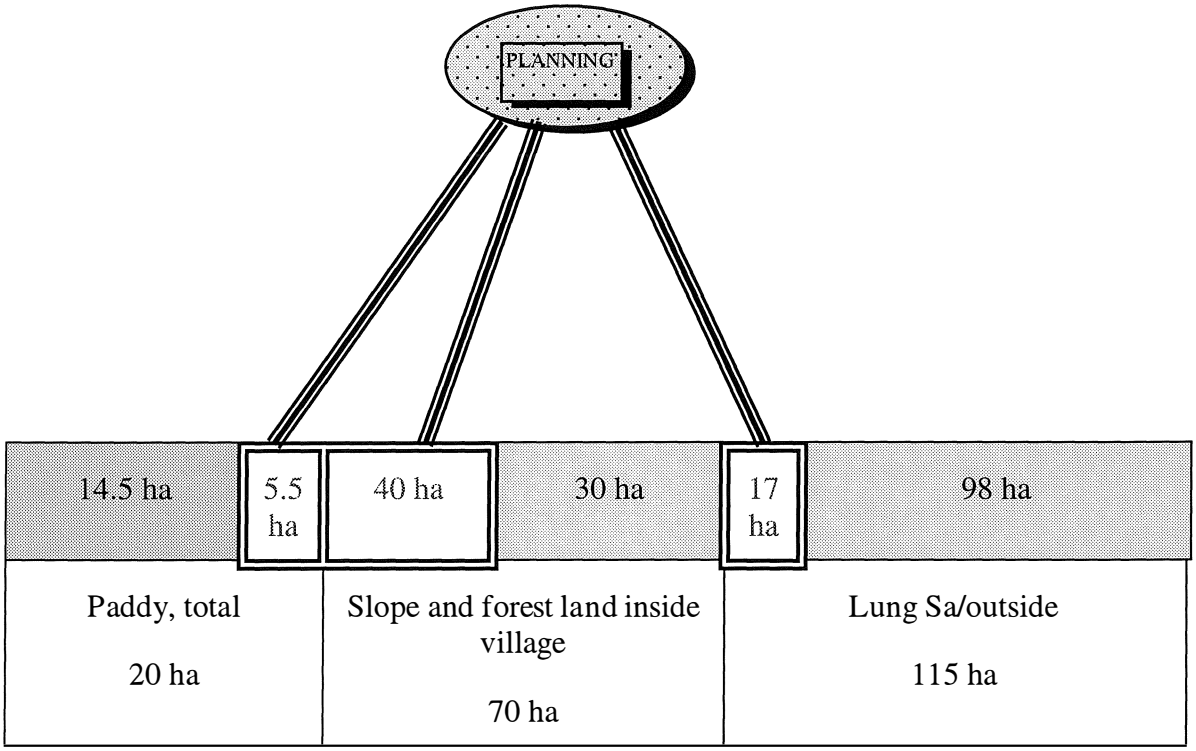


Figure 6.1: Area included in the "Project of Land Use Planning for the period 1997-2010) and the total land area used by Lang Ha village (based on sampling inventory and villagers estimate of shifting cultivation activity in Lung Sa)

In effect, the shaded areas are not included in the planning process. These areas represent a substantial part of the agricultural production of the Ban Lau Commune in general and the Lang Ha village in particular.

Planning data and targets set for year 2010 in Ban Lau Commune

When considering the Ban Lau Commune as a whole, the planning actually disregards the fact that some 50 % of the land area is actually currently used for food production (ref. 10). Instead, most of that land is classified as "not yet used" in accordance with government standards.

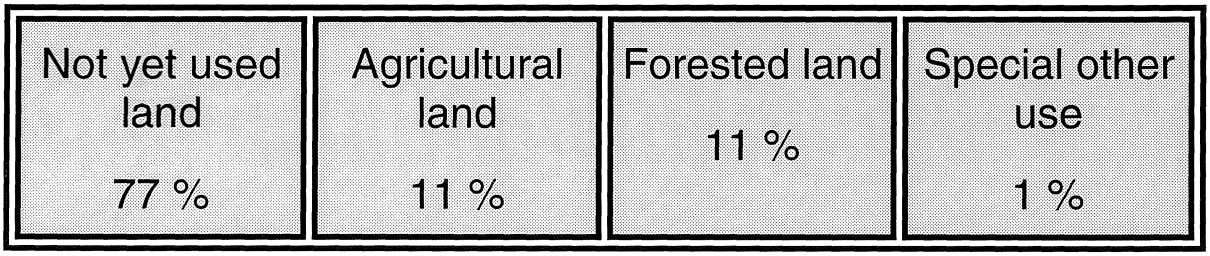


Figure 6.2: Distribution of the Commune area of Ban Lau on land use categories according to official records in the Commune (1997).

In the Table 6.4 below is indicated some data from the Commune Planning and the Project Consolidated Data respectively. The Commune assumes that only some 20 % of the total land area is used for agriculture whilst the Project found that some 66 % of the land area is used for agriculture (sampling estimate). The land presently used for shifting cultivation is the same land, which is in the category "not yet used land" and potential agroforestry land. It could be understood as if the present shifting cultivation land is to be converted into agroforestry land.

Table 6.4: Planning and Project Consolidated data for 1997/98 and targets for 2010 for Ban Lau Commune

Land		**Project Consolidated Data, %**	**Commune Planning Data 1997/98, %**	**Commune targets for 2010, %**
Agriculture land		66	20	20
	Paddy	9	3	3
	Shifting cultivation	57	13	0
	Others	-	4	17
Forest land		32	21	21
	Forest cover	13	21	21
	Degraded forest land	19	-	-
Other land		2	2	1
Not yet used land, potential agroforestry land		0	57	58
Total		100 %	100 %	100 %

The discrepancies observed in input data in the strategic planning process are substantial. Another observation is that the existence and magnitude of the discrepancies is well known amongst the very competent and professional officers who have produced the planning report. At this stage, it is not possible to analyse this phenomena further. A suggested reason is the existence of a specific "planning culture" combined with a normative professional tradition.

7. APPLICATION OF THE AREA PRODUCTION MODEL (APM)

7.1 Scenarios as a tool for analysing land use strategies

A purpose of strategic planning is trying to calculate what is the "best way" (strategy) to go from the current situation to a desired future situation. In other words, what do we need to do now and in the coming years in order to reach the desired goal at the given time ? Is there another optional "way", and what is required in that case ?

One technique that could help to "analyse the future" and compare different options is the simulation of development scenarios. For that purpose a computer model like the Area Production Model, APM (ref. 5, 6, 7, 10, 11) could sometimes be a helpful tool.

When using a model like APM, we must realise that only if we understand and accept the basic conditions of the Model and the input data that we specify by ourselves, we can make good use of it. The most important information is not the output result (by adjusting input data we can produce any sort of output). Instead it is the input data that are the most important, because they will tell what conditions are required to achieve a certain output result. In other words, they indicate possible strategies.

Instead of elaborating further, we illustrate the use of scenarios by the case study in Lang Ha. In the Study four (4) different scenarios were outlined. Because of time shortage Scenario 4 was not run, as it can basically be evaluated based upon the outcome of Scenario 1 and 2:

Scenario 1: The first scenario has the ambition to describe "*a reasonably likely development*" as seen by the research team. It would be pre-sumptuous to call it a prediction, but we use the information we have to try and make our best guess of what might happen. The input data are based on the information collected by the Team in the sampling inventory and discussions with various concerned parties.

Scenario 2: This scenario is named "*official data*" and uses official data from the Master Plan 1997-2010 as input, when possible (as seen in previous sections, the Team concludes that some official data are not correct). The scenario aims at scrutinising the Plan and analysing how sensitive is the strategic planning to incorrect data.

Scenario 3: The third scenario, named *"no shifting cultivation"*, has the purpose of analysing how economically important is the activity in Lung Sa to the villagers and what actions would be required inside the village boundaries if the agriculture activity in Lung Sa had to be phased out.

Scenario 4: The scenario is named *"higher rice yields"* and describes the potential of increasing the average yield in paddy cultivation from a current level of some 3.2 to a future level of 5.6 T/ha and year by use of better agriculture techniques. (5.6 T/ha and year is the yield on the better half of the "skilled farmers" paddy areas of today). Another aspect high lighted in this scenario is the possibility of increasing the forest cover to the level suggested in the Master Plan.

7.2 Input data to APM scenarios for Lang Ha Village

An initial step in APM simulations for scenarios on land use development is the defining of input data. Three main types of input data could be identified:

- The situation at the starting year of the simulation (areas, yields, quantities..)
- Change rates for subsequent time periods of 5 years
- Priority of land transfers

In the case the simulation describes a historical period (for example 1948 – 1998), the status of the starting year (1948) will have to be traced and described. In case the simulation describes a period of future development (such as 1998 – 2048) the starting year data represent the situation of today.

Defining input data involves not only the capture of representative data but also careful interpretation and evaluation of the data. One usually finds that there is no such thing as perfectly correct data – not for the past or current situation and certainly not for assessments of the future development. Sampling errors, varying definitions of different parameters, degree of generalization of data and other conditions are factors that contribute to making various judgements and compromises a prerequisite in a simulation. Therefore, it is important to declare what assumptions and interpretations have been made, so that others can evaluate the results and if they wish apply other input data.

For good understanding of the simulation process, the input data to *"scenario 1"* in this study and the judgements behind those input data are specified in detail hereafter. The conditions and input data to other scenarios are explained in the end.

- *Village area*

According to the sampling inventory the area inside village boundaries is 112 ha. The area in Lung Sa (outside village boundaries but used by 23 households of the village for shifting cultivation) has been estimated at 23 x 5 ha (cultivated) + 35 ha (forest) = 150 ha. The above figures equal a village gross area of 262 ha (see fig 4.3).

- *Simulation period*

The population of Lang Ha did not change significantly between 1945 and 1975 and there are few signs of other economic development during that period. To cover both a historical period (for reference) and future development, the period 1970-2020 has been chosen for the simulation.

- *Priorities for land transfer*

The priorities define what land is primarily converted to agriculture land if conditions change and more agriculture land is needed, and the reverse if the area required for agriculture will decrease.

In the simulation the area of Lang Ha (according to the land use sampling inventory) has been distributed on the APM categories as follows:

APM land use category:	Land use according to the inventory:
Agriculture land, subsistence food	Paddy fields
Agriculture land, market food	Shifting cultivation (maize/rice/cassava)
Agriculture land, cash crops	Orchards / home gardens / perennial trees
Potential forest land / pot. agriculture land (acc. to watershed protection status)	Grazing land and brush land
Unproductive	Other land
Environmental forest, protection areas	The existing forest inside village borders
Farm forest land, natural forest	Existing forest in Lung Sa

- *Population at start and population growth*

At first we assumed that current household size in Lang Ha (5.1 persons/hh) had not changed over the last 28 years (Table 7.1).

Table 7.1: Estimated number of people in Lang Ha Village 1970-1998 based upon information of household number and assuming constant household size:

1970 5.1 x 6 hh = 31 persons	1990 5.1 x 29 hh = 148 persons
1975 5.1 x 13 hh = 66	1995 5.1 x 33 hh = 168
1980 5.1 x 15 hh = 77	1997 5.1 x 34 hh = 173
1982 5.1 x 23 hh =117	1998 5.1 x 41 hh = 209
1985 5.1 x 15 hh = 77	

We found that the population growth in 1975 (by immigration of many new households) is difficult to describe in the model. The programmer had not foreseen a population growth of 113% in one year. In the simulation, that increase has had to be distributed over a longer period for purely technical reasons.

It also seems that above suggested increase from 1997 to 1998 is questionable. The fact that 7 new households were established during 1997, in some cases by separation from the parents households within the village, did not increase the population to the same degree but rather influenced the average household size. Possibly, some families had waited for a suitable occasion to form a new household and the economic situation or the land allocation played a role in this case (author's speculations).

Consequently, we cannot perfectly describe the fluctuations in population by the Model (and we do not know the exact number of people in the past, but only the No. of households). Therefore, we make the best possible "fit" so that the population 1970, 1985 and 1998 corresponds with the actual number as far as we can estimate it. However, we keep in mind that the population during 1975-85 and maybe also in 1990 (as an example) was somewhat higher than described by the Model.

- *Average income and economic growth*

The approach to calculate "GDP" on village level is to estimate the production of goods and services by Lang Ha villagers in 1970 and in 1998 respectively and to assess the rate of change between those years by subjective judgements. (GDP is not a quite appropriate expression, the "agriculture income" should be more correct).

In 1970 the official production for the market is judged to have been almost nil. Subsistence production was predominant. Other production (some pigs etc. for the black market) is set at 25 % of the subsistence production. We also assume that farmers produced their needs of subsistence food (set at 360 kg of unhusked rice).

The way the "agriculture income" is calculated in this exercise is shown in Table 7.2.

Table 7.2: Calculation of "agriculture income" per capita in Lang Ha Village

Item	**Calculation**	**Income/person**
Average "agriculture income" per person in 1970:		
Rice	360 kg x 0.7 (a) x 2500 VND/kg	0.63 MVND
Other	0.63 MVND x 0.25	0.16 MVND
TOTAL (1970)		0.79 MVND = 60 USD
Average "agriculture income" per person in 1998:		
Rice	360 kg x 0.7 (a) x 2500 VND/kg	0.63 MVND
Pigs (b)	4 pigs/hh,yr x 0.7 MVND per pig / 5.1 persons	0.55 MVND
Buffaloes	1 buffaloe/hh,yr x 1.0 MVND / 5.1 person	0.20 MVND
Hillrice (c)	(23T–7T (poor hh)) x (3 MVND/T)/209 person	0.23 MVND
Fruit (d)	(0.3 MVND x 12 hh) / 209 persons	0.02 MVND
Electricity	0.36 MVND x 20 hh / 209 persons (e)	0.03 MVND
TOTAL (1998)		1.66 MVND = 128 USD

Remarks:

a) factor for conversion from unhusked to "husked rice
b) each household (5.1 persons) produce 4 pigs and one buffaloe per year
c) 23 households in Lung Sa produce 1 ton each (7 hh have rice deficit)
d) 12 households (by roadside) get 0.3 MVND/year
e) It costs 0.36 MVND/year to buy electricity, some 20 hh have generators

- *Subsistence food – production at start and annual growth*

Separating subsistence and market crops in practice can be complex. Some farmers produce a minor surplus of paddy and some upland rice is used for subsistence, but the predominant part of the upland rice is sold in the market. In Lang Ha, those marginal households who have a shortage of rice for subsistence often tend to sell the more expensive upland rice and buy paddy rice or other food for subsistence.

The current APM version is not well suited to handle two subsistence crops with big difference in yield (such as upland rice and paddy rice). So, we make the convenient assumption in the simulation that paddy rice is for subsistence and upland rice for the market. Using the same principle, all maize and cassava are considered market crops.

When it comes to changes in yield, the village told that some of the skilled farmers had been able to increase their yield from 2.4 T/ha during the cooperative period to 5.6 T/ha by now. We assume that the paddy yield has been doubled since 1970 and that an average household produced 60-70% of a skilled farmer or 1.5 T/ha at that time.

1998 41 households with 20 ha of paddy or 0.5 ha per hh produce as follows:

Table 7.3: Calculated production and yield of paddy rice on different income groups

Marginal farmer:	8 hh x 0.5 ha x 2.0 T/ha	8.0 T
Average farmer:	17 hh x 0.5 ha x 3.2 T/ha	27.2 T
Skilled farmer:	16 hh x 0.5 x 4.4 (50%x5.6 and 50%x3.2)	35.2 T
Total paddy production:		70.4 T
Average paddy yield:	70.4 T / 20 ha	3.5 T/ha

- *Market food crops – production at start and annual growth*

Upland rice (hill rice), maize and cassava are considered market crops. Maize and cassava are often used to feed the pigs, but many pigs are sold, so, indirectly they are market crops anyway.

For upland rice we have no data on yield changes but some experience from a research study of the Project in a shifting cultivation area in Lao PDR. Although, the crop yields (kg/ha a certain year) decreased for upland rice the total production over the whole area used for shifting cultivation (including fallow land) had increased from approximately 100 kg/ha, year (45 years ago) to 250 kg/ha year (by now). The reason was that land was more intensively used with shorter fallow periods. Accordingly, we assume that yields of upland rice in Ban Lau have increased by 50% since 1970.

Based upon information from the village the following yields could be expected:

Upland rice: Cultivated 3 years out of 10 with a total production of 2.5 T/ha, 10 years
Maize: Cultivated 3 years out of 10 with a total production of 3.1 T/ha, 10 years
Cassava: Difficult to calculate, less than maize, maybe 1 T/ha, 10 years

An average for the three shifting cultivation crops grown in rotation with fallow is estimated at 6.5 T/ ha over 10 years or 0.65 T/ha and year.

- *Cash crops – production at start and annual growth*

The best example of cash crops produced in Lang Ha are the apricots (some of which are bought by tradesmen from Hanoi). One of the farmers with an apricot orchard of a less than one hectare produced about 3T per annum. The production is approximated at 4500 kg/ha and year. As it is a new crop there should be a potential to increase yields by using better varieties and techniques but it is difficult to estimate.

- *Area of various land use categories*

The distribution of the area on different APM land use categories by 1970 is based upon the sampling data for 1968. For Lung Sa it is assumed that each of the six households cultivated 5 ha and the remaining area of 120 ha was covered by forest.

7.3 Outcome of the different scenarios

This part and the previous part (7.2 and 7.3) include a lot of figures and interpretation of a detailed plan written in Vietnamese language. For this reason and because of time shortage, there may be misunderstandings and errors from the Researchers side in the current version of the report.

The main purpose of presenting all details is above all to illustrate the process required:

– To go rather deep into the detailed data and conditions
– To regularly "move one step back", study the data and the outcome and consider whether or not it makes sense.

Three scenarios are compared hereafter:

Scenario 1 - " A reasonably likely development" 1970-2020
Scenario 2 - " Official data" 2000-2020
Scenario 3 - " No shifting cultivation", 2000-2020

The researcher does not suggest that any of these scenarios will happen. The purpose is to illustrate the fact that there will be different outcome in the future depending on what we do now.

Population:

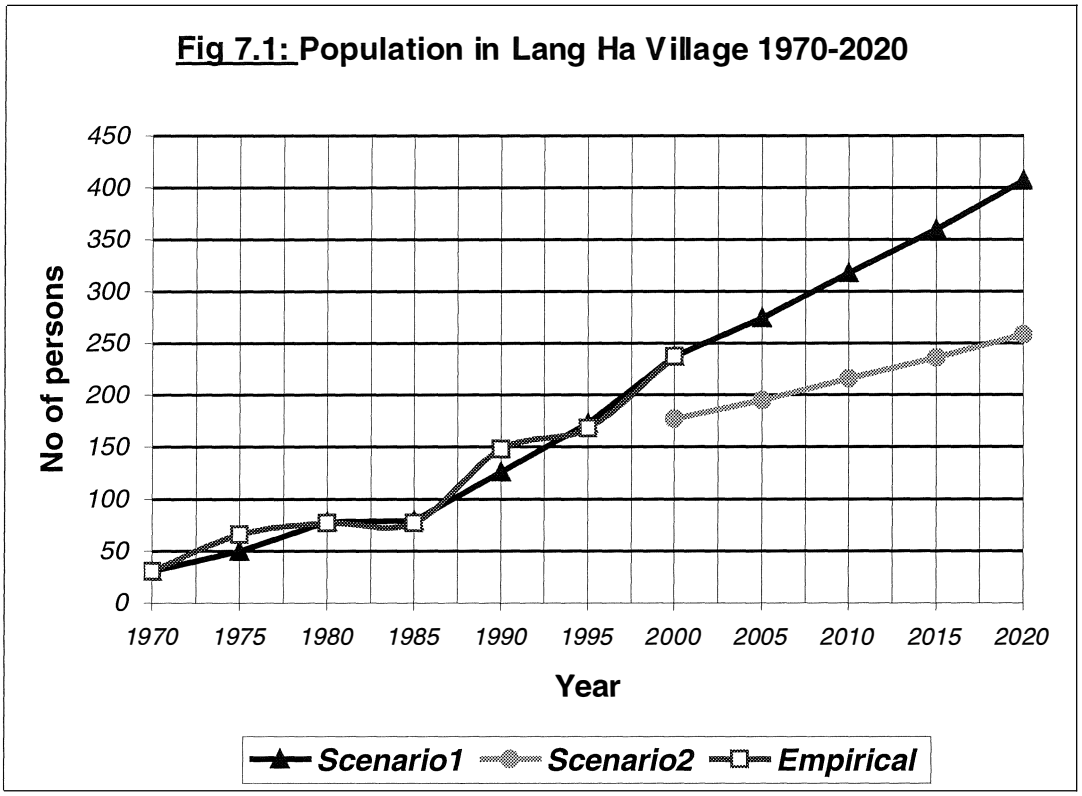
Scenario 1: The village population during the years 1970 – 1998 has increased with a rate of 7.0 % as an average (from 31 to 209 persons). However, because of migration and other reasons it has been very irregular. A family planning program was started in 1995 but will probably only partly influence the increase of population in the near future as there are many young couples in the village.

In the year 2000 the population is estimated at 237 persons. With an increase of 3.0 % during 2001-2010 and 2.5 % after that population will be 318 persons in 2010 and 407 persons in 2020 or almost double from now (fig 7.1).

Scenario 2: The Plan data for 1997 was only 166 and the population in year 2000 estimated at 177. The planned increase is 1.8 % from year 2000. The population would then be 177 (2000), 212 (2010) and 253 in 2020 (21 % more than now).

The reality has run quite far away from the Plan after the first year. It is nothing very strange in that, but we can observe that the actual population in 1998 is more or less the same as the projected figure for year 2010.

Scenario 3: Same population growth as scenario 1



Economic growth:

Scenario 1: The "GDP" in 1998 based upon livestock, rice production and some marketed crops (fruit, maise) and facilities (electricity) is estimated at 131 USD/capita corresponding estimate for 1970 is 60 USD/ capita). To reflect increased growth after the economic reforms in the late 1980s it has been set at 1% increase/year until 1985 and 5% thereafter. An assumption of 5% increase per year for 2000 - 2010 and 3% after that gives 145 USD (year 2000), 236 USD (2010) and 317 USD (2020) (fig 7.2).

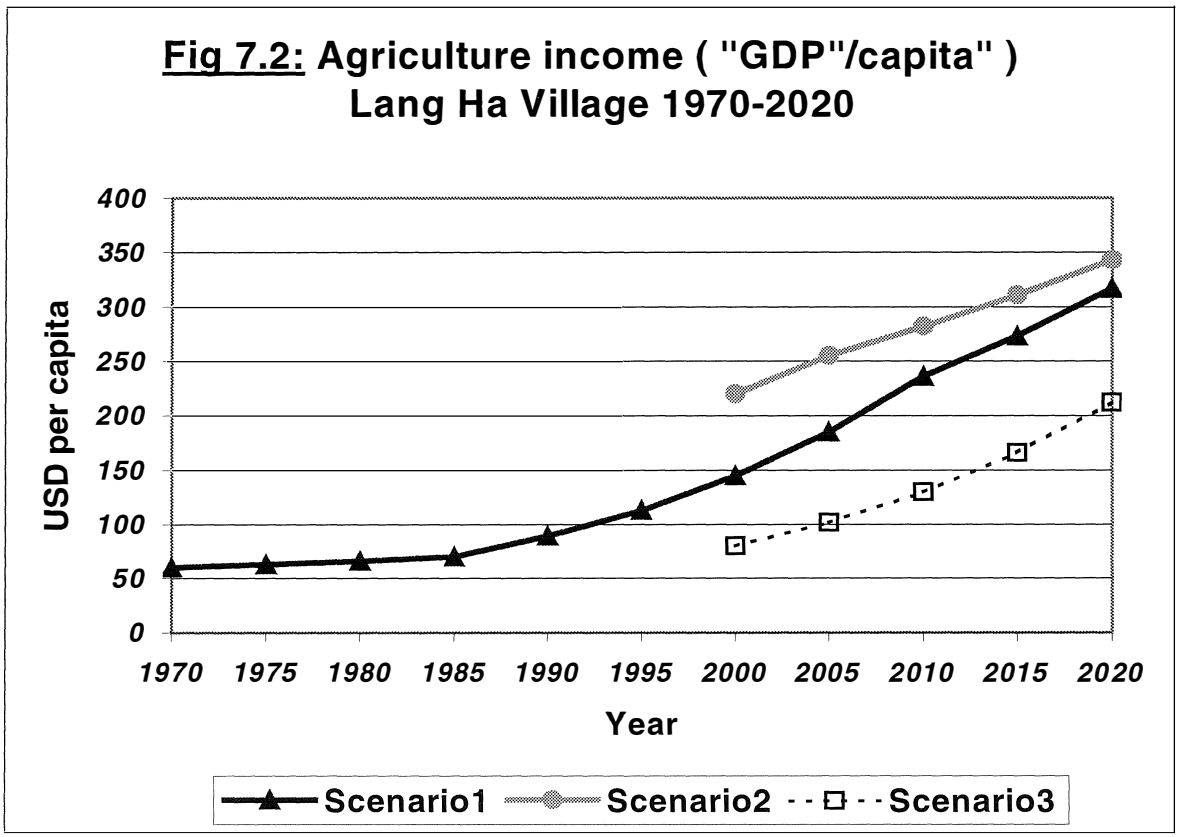
Scenario 2: The "GDP" is estimated at 220 USD per capita (year 2000). A growth of 2.5% until 2010 and 2% after that that gives 282 USD (2010) and 343 USD (2020).

The Master Plan figure in scenario 2 is higher than the calculated figure (scenario 1). The reason is partly a slightly different way of calculating, but also quite different expectations on the income from cash crops.

The Master Plan does not include any shifting cultivation in Lung Sa and suggests that rice production will increase very little compared to now. It does, however, acknowledge extensive production of upland crops (maise, cassava, hill rice) in 1996. To compensate for small production of such crops in the future, the Plan suggests that the production of fruit and marketable food, peanuts etc. will increase strongly (in the Commune as a whole the increase is about 10 times between year 1996 and 2000).

Scenario 3: If the Lung Sa area hypothetically cannot be used from year 2000, all production by Lang Ha villagers from Lung Sa (maise, cassava, upland rice, pigs) will have to be replaced by something else. The production in Lung Sa accounts for about 50-55 USD/capita. It means that GDP will initially drop to a level of about 80 USD/capita. With an economic growth of 5% (which will be probably by very difficult to achieve in that case) it will take 12-13 years to reach the current level of 131 USD.

In practice, Scenario 3 is not realistic, but it is of interest to discuss consequences and possibilities to abandon Lung Sa (and if that is desirable). One should also consider what households will be most affected and who have the options to do other things.

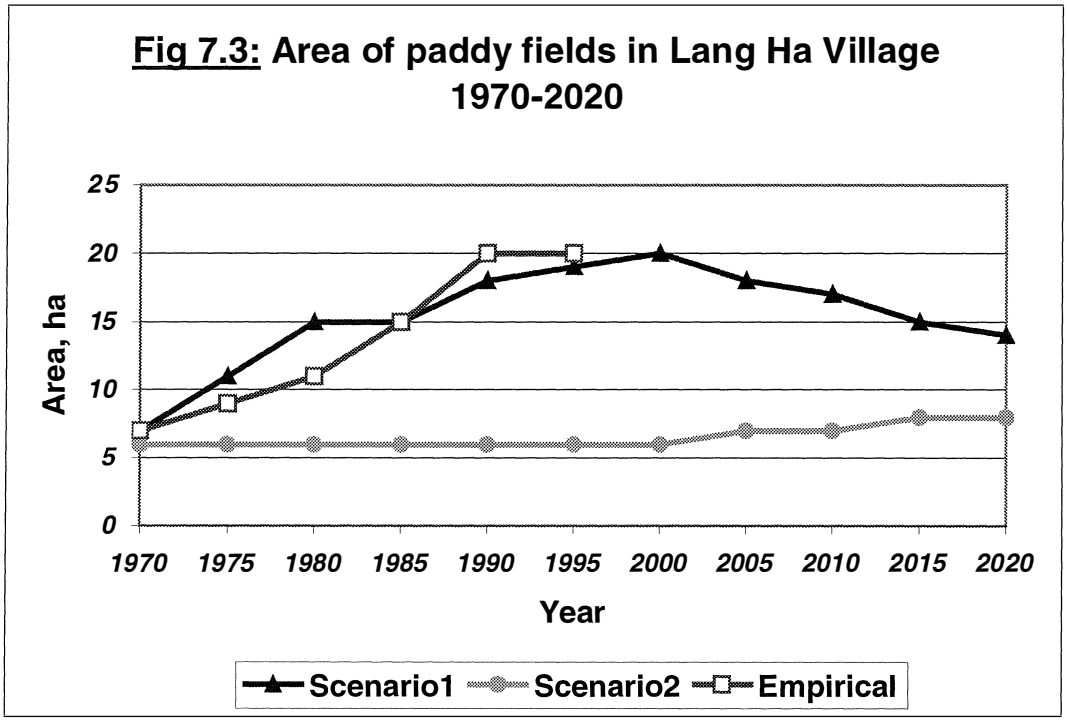


Agriculture production - subsistence:

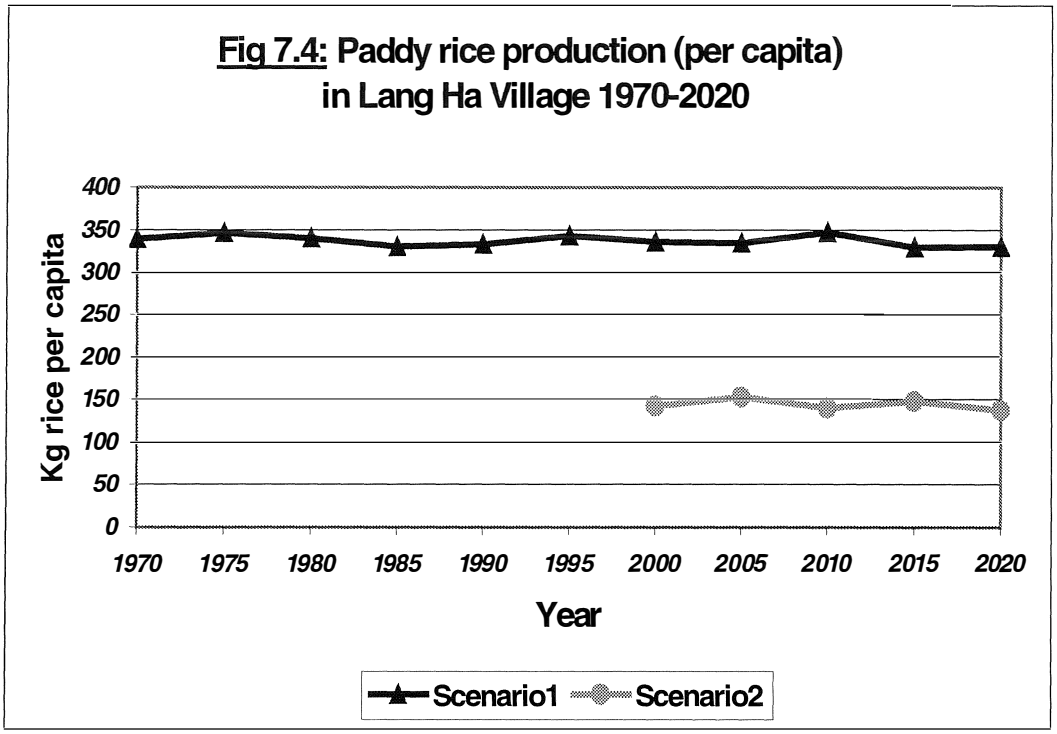
Scenario 1: During 1970-98 the area of paddy fields increased from some 7 ha to 19 or 20 ha (fig 7.3). At the same time the yield has increased from 1.5 T/ ha to 3.6 T/ha. It means that the total rice production increased from 10.5 T to 68.6 T or 6.5 times (fig 7.5). The population also increased at the same rate. The annual rate of change in rice yield was very low (1%) before 1985 and some 5 - 6 % after that year.

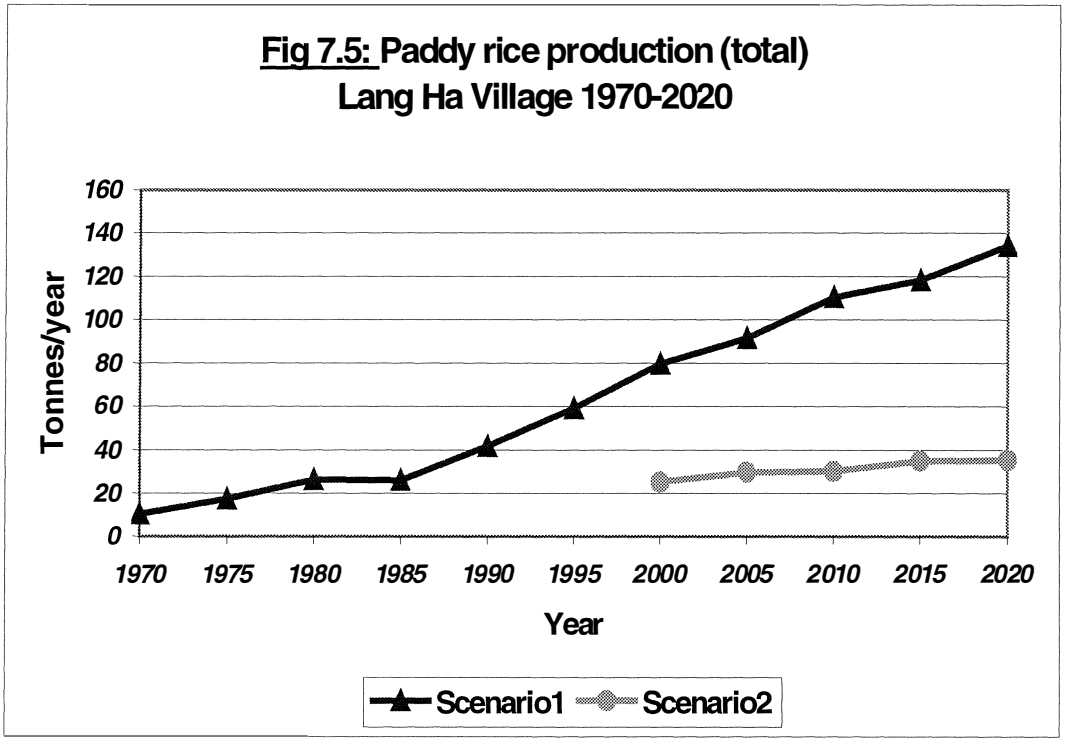
During times of rapid in-migration such as 1975-85 there was not enough paddy for subsistence. It is illustrated in figure 7.3, where the estimated paddy area in that period is less than the required area as expressed by scenario 1. As shown in Section 4.2 the shifting cultivation also increased rapidly during that period.

For the period 2000-2010 the growth of yield is set at 5% and after 2010 at 4%. In that case, the yield will be some 6.5 T/ha in 2010 and 9.5 T/ha in year 2020. When the rice yield increases faster than the population there will be a surplus of paddy rice and some less productive paddy fields are converted for cash crops. As a result the area in year 2020 will be about 14 ha.



Scenario 2: In the Plan there are 6 ha of paddy producing 4.2 T/ha as an average in 1998. A very slight increase of area and yield is foreseen so that 7 ha will produce 4.3 T/ha in 2010 and 8 ha will produce 4.4 T/ha in 2020. As a result the amount of paddy rice produced per capita will remain on a more or less even level of some 140-150 kg during the whole period until 2020 (fig 7.4). Those figures correspond to a level of about 12 kg per capita and month and seem to imply a constant deficit in indigenous paddy rice to cover the subsistence needs of the village.





Comment: According to the Master Plan some 55 kg/capita of dry rice was produced in Ban Lau Commune in 1996, but it avoids mentioning dry rice production in the Plan for 2000 and onwards. However, it estimates that in total 180 kg/capita of "rice and other cereals" should be produced in year 2000. The corresponding figure for 1996 is 270 kg. It looks as if hill rice production to a great extent is disregarded in the Plan. Anyway, information is not sufficient to penetrate all data and ideas in the Plan.

Agriculture production – crops for the market:

Scenario 1: Marketed crops in Lang Ha is today mostly maise and cassava for pig raising and upland rice. The main part of it is currently grown in Lung Sa. So far, the yield has increased with about one percent annually because of more intensified shifting cultivation. The potential to increase yields further is not so great for those crops. However, some areas will also be used for vegetables and other annual crops and an increase in yield of about 2 % per year is foreseen. The current yield of 680 kg/ ha will thus increase to some 863 kg/ha in 2010 and 1052 kg/ha (2020). Land used for market crops increases from 98 ha (1998) to 139 ha (2010) and 153 ha (2020). Both forest (in Lung Sa) and current brush-land will have to be converted for that purpose.

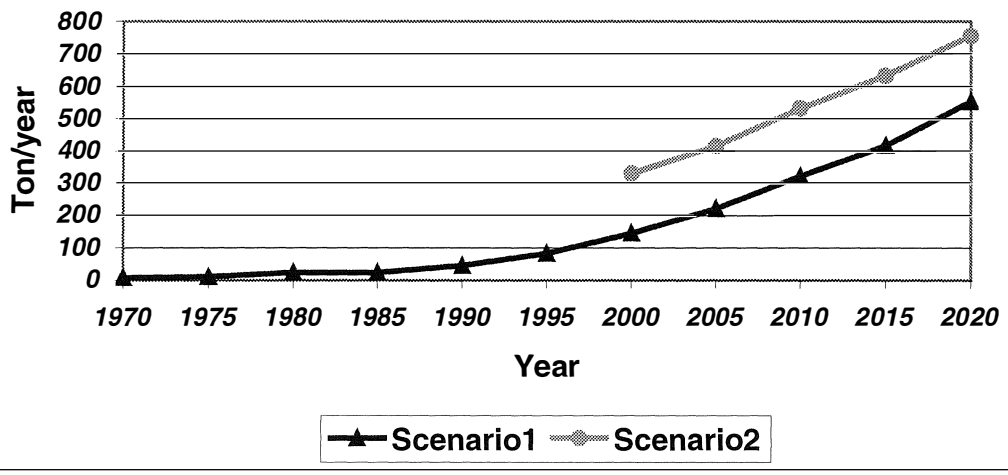
Cash crops (mainly fruit trees) cover some 26 ha in 1998. Only half of that area exists inside Lang Ha village but some other 10-15 ha of the area in Lung Sa might be called cash crops. With an increase in yield of some 3% the production will go up from 4.5 T/ha (1998) to 6.2 T/ ha (2010) and 8.4 T/ha in 2020.

Scenario 2: Concerning market crops the yield does not change during the period 2000-2020 but remains stable on a level of 2200 kg/ha. The area increases from 17 to 27 ha. In total some 37 T will be produced in 2000 or some 211 kg/capita. The figure includes 1 ha of maize and the remaining part "food plants" (vegetables).

For cash crops (esp. fruit trees) the yield is planned to change by 3-4% annually from 10 T/ha in year 2000 to 15 T/ha in 2010 and 20T/ha in 2020. The area is expected to increase slowly from 33 ha in 2000 to 37 ha in 2020.

Comment: The Master Plan expects the production of fruit in year 2000 (total figure for Ban Lau Commune) to be about 10 times higher than the reported figure for 1996 (2116 T compared with 285 T). For vegetables the same change (1016 T compared with 105 T) is presented.

Fig 7.6: Production of cash crops in Lang Ha Village 1970-2020



Land use changes:

Scenario 1: The forest covered area in Lung Sa has decreased from 127 ha to 53 ha in 1998. In this scenario all forest in Lung Sa will be converted to agriculture land in year 2009 (the model is rather simplistic). After that the brush and grazing areas will be converted so that 33 ha remains in 2010 and 8 ha in year 2020 (Annex D). The forest areas of today inside the village boundaries will still remain but not increase. What the model expresses is that, with the conditions set up, all available land will be needed for agriculture quite soon.

Scenario 2: The area of potential agriculture land (slope land with brush etc.) will gradually be converted to crop land and reduced from 17 to 0 ha during 2000 to 2020. The existing forest area of 23 ha will remain.

7.4 Comments and conclusions

The APM has been given attention by the Vietnamese government. A matter of concern for them (as well as for this project) is - how could the APM possibly be useful in planning and strategy development in Vietnam ?

In the Researcher's opinion, the APM provides at least two important inputs related to the concept of the Model:

Firstly, any APM scenario comprises all land and all people. Initially, we need to know and understand our data so well that we basically "know" what will happen. Assume that we develop a scenario and find that the result is unrealistic because the APM does not or cannot describe the "correct" (in our opinion) development. At that time we often realise that the planning conditions are incorrect. When trying to describe the development of Lang Ha but excluding the area of Lung Sa we find that any scenario will be wrong. Once Lung Sa has been included, it is also possible to start thinking of desired future land use in that area.

Secondly, the APM considers the actual land use as a base. It is not possible to develop meaningful scenarios without acknowledging that any land used primarily for food production is also considered as agriculture land. Forestry is an alternative land use that is of interest only when the food sufficiency issue has been settled for all people living in the area. As an example, shifting cultivation can be handled when both cultivated land and fallow land is considered to be used for agriculture and the yield per annum for the whole cycle is estimated.

In this chapter, the APM has also been used to scrutinise an official plan. As a tool for evaluating plans and assumptions, putting questions etc. it functions fairly well.

With the above arguments, the Researchers have indirectly suggested, that the APM is not a tool to be run for any geographical area in a mechanical way, but rather for representative pilot areas where the "planner" spends enough time to get to know the situation and to consider strategic options.

There are also a number of Model improvements required to adapt the APM to the local situation. Some of them should preferably be programmed into the computer model. A few examples:

- The possibility of specifying more than one crop of subsistence food, market food etc. It is insufficient to calculate average yield of paddy (magnitude 5 T/ha, year) and upland rice (magnitude 0.2T/ha) as an example.

- The freedom to define forest categories according to local conditions and standards.

The APM could be developed to better reflect some important forms of land use, grazing and shifting cultivation (more complicated) ore such examples, but it is also possible to handle those land use forms in a simplified way, as it is done in this study.

One important part of the evaluation will be the economical considerations and calculations. If the option of producing more cash crops or market crops instead of food for subsistence is to be evaluated, one has to estimate the price of the alternative crops, not only the volume. It might be possible to re-program the APM for that purpose, but it could also be done separately on a paper.

Anyhow, the analysis of the Scenarios and the look into the Master Plan leaves some impressions with the researcher:

Re. the Master Plan:

When looking into the details in a Plan with so much data and information it is quite natural that errors are detected and that some parts can be questioned. The Plan has been developed with a serious intention and the efforts should be respected. The Researchers also admit that they might have misunderstood or misinterpreted some parts. They could not read the exact wording as the Plan was written in a language they do not know well. There might also be assumptions made in Vietnamese planning with which they are not familiar.

However, the Research Team has identified a few matters of general significance.

- The disregarding of shifting cultivation and the agriculture production in Lung Sa and the major part of the paddy fields makes the Plan weak. By excluding the activities in Lung Sa and some 2/3 of the paddy fields more than half of the current economic production is left out.

- As a result the Planners have had to make a possibly over-optimistic predictions about the increase in fruit and vegetable production from the current situation (1996-97) to the year of 2000.

- The potential to increase paddy production (which the villagers expressed would be quite possible) does not seem to be well utilised in the Plan.

- How the cattle should be supplied with food is not quite clarified in the Plan.

8. VISIONS AND INTENTIONS FOR THE FUTURE

The strategies of the Commune are expressed in official plans and documents.

The Villagers also have strategies. Sometimes, when expressed by the leadership one can expect that they will conform with the official strategies but also make use of local knowledge and personal ideas.

How do the visions and intentions of the common farmers look like? In the following some views and ideas expressed by the villagers during interviews and the village dialogue (see also Annex B) are summarised.

The Village Leader, Mr Sing together with 6 village representatives: Presently, only some 25 % of the households use high yielding varieties (rice), commercial/chemical fertilisers, pesticides and good irrigation practices in combination. Only 10 % of the inside forest land/slope land is used for permanent cultivation (fruit trees). If the remaining 75 % of the farmers use the above combination of modern tehniques and some 40 % of the slope land is used for permanent crops, the village would very much prosper and would be self sustained on food. The problems are that we lack knowledge of soils, of suitable species, of modern agricultural techniques. The focus must be on land use for the coming five years. Economic diversification and processing will come later, the priority now is on efficient and modern land use.

Comments from the audience: Land use is not enough, we must have a strategy for village education, the young farmers must learn modern agricultural practices, we only grow older. The Dao should learn from the Kinh - why are they rich? They kow about irrigation, fertilisers, good labor and maintenance and species (suitable)

The present yields of rice could expand from 4.2 ton (1 crop/annum) and 6.7 ton (2 crops/annum) to some 9 - 10 ton per annum with the use of modern techniques and inputs. We have land, - skills and techniques are available, we must learn how to use those.

Some quotes from Mr Tam, the model farmer

"Everything in this house comes from agricultural production!"

"10 years ago, we had visions but could not carry out them. Today, we have visions and can actually carry them out!!"

"The number one issue is food security. On the basis of the land allocation, we would expect to produce raw material which we can process, that is, we must do more than just produce our own food!"

Photo 7: For many farmers in Lang Ha thinking of the future concerns how to develop the farming. There are very few activities outside the agriculture field.

Photo 8: One of few non-agriculture projects in Lang Ha. This man has raised money to build a dam and plans to sell water to farmers at lower elevation during dry season.

9. A STRATEGIC DILEMMA

The subtitle of this working paper "government plans and farmers intentions – a strategic dilemma" does not propose that there is a conflict in interests or ultimate objectives between the Government on one side and the farmers on the other. Instead, it focuses on the paths and the means to achieve those objectives – the strategies and the planning process.

The objective of the Study "to develop methods to improve the process of strategy development (strategic planning) in relation to a sustainable use of forest land" also suggests that there are improvements to be made in this field.

Following the analysis of existing data, plans and planning procedures on commune and village level in the Study area in Lao Cai Province, the Researchers suggest that both Government and the Villagers have objectives that coincide very well. Stable and sustainable land use, secure borders, improved infra structure and social service, economic growth, education and moderate population growth are some obvious examples. (ref. 4, 10, 13). Restoration of denuded hills is to some extent conflicting with the immediate interests and needs of swidden cultivators (as the "denuded hills" represent their agriculture land), but not in the long-term perspective.

However, it is found that the planning process might not always efficiently support the development towards those goals. The Study highlights two possible shortcomings in the current planning procedures:

1) The plans do not properly reflect the situation from where planning has to start (the actual current situation) but tend to describe a desired situation instead.

2) The traditional planning procedure in Vietnam where data needs are specified on high level and sent downwards, and subordinate levels fill up "boxes" in accordance with targets and forward data upwards in the administration does not support transfer of all relevant information. In particular activities that are outside policy and not promoted by the authorities tend to be disregarded.

The observations are somewhat in line with a World Bank report with comments on the "Decree 327 Program", (ref 13, p. 246). In the report concerns are expressed that (a) barren lands might already be utilised for cultivation and that planning might be influenced by the land shortage and (b) that farmers level of participation in resource use planning is too limited).

One outcome is that extensive efforts are made by qualified staff to prepare plans of questionable value. If people know that plans are wrong they will not pay attention. In the worst case, the consequence might be that contradicting or irrelevant strategies are adopted on the local level.

It is, however, observed that a lot of positive development has taken place entirely outside government planning. The message that there is much more paddy land than in the plans, which is established on the farmers own initiative, is certainly one such example.

This situation might suggest that planning and strategies are pointless. That is, however, a premature conclusion. There are many examples that strategies and planning has played an important role to development in Vietnam. Some of them have been more successful than other and some could be considered failures. Some have had negative effects in the short perspective but look different in the long perspective.

In the studied village of Lang Ha, the Government strategy (or policy) of encouraging farmers from Thai Binh Province of the Kinh ethnic group to resettle in the Dzao community during the 1970s, in order to stimulate introduction of new agriculture technology (and to relieve upland pressure in the lowlands), has been appreciated by many original farmers and seemingly fulfilled it's objective (ref. 9). The strategy of starting to reforest slope-land with perennial trees (mainly fruit) has also been widely adopted by many the villagers. Whether it will be economically successful in the end is yet too early to say. The strategy of land allocation is initiated and a first step completed. It is likely to influence future land use significantly in one way or the other. The farmers are apparently interested in and worried about its consequences at the same time.

A government strategy of not trying to influence development at all but leave all decisions to local level is hardly desirable. It is probably not so that the sum of all local strategies is best for the nation or its environment, protects the weak groups and so on.

The issue is not if government planning is needed, but rather how the government level could support development on local level in the best way, how it could avoid procedures being unnecessary and of hindrance to development and still maintain influence on the same development?

Some different approaches that could contribute to developing strategic planning, have been tested in the Study.

1) A simple land use sampling inventory involving villagers as key informants.

2) A communication process, which has been named "village dialogue" and includes contacts with commune, village and sampled households, frequent field visits, discussions of historical trends and a final strategic discussion on village level.

3) Application of a simulation model, the "APM" for analysis of future land use and socio-economic changes (scenarios) under different conditions and strategies.

The approaches should be seen as complementary parts in a process.

The sampling is seen as a relatively fast, inexpensive and low-technological way to obtain objective and up-to-date information on the actual land use. It requires some basic understanding of statistics by the person in charge, but makes use of the local knowledge and involves the local people in the data capture. It has been tested on village and commune level in Vietnam and for a watershed area in Lao PDR with minor variations in the design. It is not only suited for initial assessment of an area to be studied but also for monitoring purposes in relation to planning.

The ”village dialogue” is an important complement to the sampling (or vice versa). One important objective is to gain sufficient understanding of the conditions, restrictions and perspectives required for strategy development on local level. The Researchers regards it primarily as an approach to be used for sampled pilot villages. However, if the concept is applied extensively in operational and implementation oriented forms of planning, the purpose of developing trust between government officers and villagers is also important.

The “APM” is a tool for analysis of strategies. Technically it is not particularly complicated to handle. Basic computer knowledge is enough. Some improvements of the “software” are also recommended. However, the analysis is more advanced and requires a sort of experience, which is not so common in Vietnam for the time being.

The Researchers do not regard it as a tool to be used mechanically to develop scenarios for every village, commune or district, but rather a tool to be used by more centrally located staff analysing strategies for a sample of areas of different type.

The Concept of APM implies that all land is treated according to its actual land use. If input data are incorrect or some important forms of existing land use are disregarded, the scenarios developed with APM are without meaning.

The user/planner should be on a planning level where he is entitled to consider whether plans are correct or not, if information is relevant and why plans do not match the reality. Once the planner realises why APM “does not work” he will also know how to improve the planning. Maybe this requirement of planners, who might be quite rare today, could provide some hints to how planning could be improved and organised?

Photo 9: The "village dialogue" the villagers met with the research team to comment on their own history, the current situation and discuss visions and strategies for future development.

Photo 10: Land use in Lang Ha. The last part of the "dialogue" took place outdoors.

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Annex A

Work program for the research session

People's Options on Forest Land Use
1998-03-12 (updated 1998-03-27)

Plan for research work in Ban Lau Commune, Lao Cai Province and in Hanoi during March- April 1998:

The research work will be carried out during March 13 – 27 by the joint Swedish-Vietnamese team from SLU and FIPI together with the concerned staff and villagers of Ban Lau Commune and Lang Ha Village. For convenience and efficiency some of the activities will be done in smaller working groups while other works will be done jointly by the whole research team.

Date	Group 1 (Mrs Kajsa/Mrs Binh)	Group 2 (Mr Bo/Mr Chung)	Group 3 (Mr Mats/Mr Hung)
12 / 3	Arrival in Laoi Cai by train, practical matters		
13 / 3	Work with Ban Lau Commune – commune based data and plans		
14 / 3	Work with Lang Ha Village – introduction of work		
15 / 3	Introduction of household interviews (hh) and demonstration/test of method Household interview 1		
16 / 3	Household interview 2	Interview village repr.	Village/land use survey
17 / 3	Household interview 3	Re-visit Commune	Village/land use survey
18 / 3	Visit to shifting cultivation area (Lung Sa)		
19 / 3	Household interview 4		
20 / 3	Household interview 5	Interview village repr	Village/land use survey, data calculations
21 / 3	Work in Lao Cai : Data compilation and other works		
22 / 3	Work in Lao Cai : Report writing		
23 / 3	Household interview 6	Complementary household sampling (Household interviews No 7 and No 8	
24 / 3	Household interviews – follow-up work	Data analysis / village based scenarios	
25 / 3	Village dialogue in Lang Ha		
26 / 3	Work in Lao Cai – Data compilation and other work		
27 / 3	Presentation of findings to Province authorities, (return to Hanoi by night train)		

The follow-up work at FIPI in Hanoi:

The follow-up of the work in Ban Lau covers data processing, APM simulations, report writing and preparations of the final seminar at FIPI.

<table>
<tr><th>Date</th><th>Group 1
(Mrs Kajsa/Mrs Binh)</th><th>Group 2
(Mr Chung)</th><th>Group 3
(Mr Mats/Mr Hung)</th></tr>
<tr><td>28 / 3</td><td colspan="3">Return to Hanoi by train in the morning</td></tr>
<tr><td>29 / 3</td><td colspan="3">SUNDAY FREE
(Bo Ohlsson leaves for Vientiane, MS meet with Mr Chung at Hotel, 10 a.m.)</td></tr>
<tr><td>30 / 3</td><td colspan="3">MORNING FREE FOR OTHER WORKS ,
Afternoon (2 p.m.) at FIPI, joint start-up of the various activities</td></tr>
<tr><td>31 / 3
1 / 4
2 / 4</td><td>Work on compilation of data and report writing</td><td>Work on report (1 day) plus external works</td><td>Work on APM simulations and report</td></tr>
<tr><td>3 / 4
4 / 4
5 / 4
6 / 4</td><td colspan="3">FRIDAY - MONDAY FREE FOR EXTERNAL ACTIVITIES</td></tr>
<tr><td>7 / 4
8 / 4
9 / 4</td><td>Compilation of data and report writing</td><td>Work on report (1 day) plus external works</td><td>Work on APM simulations and report</td></tr>
<tr><td>10 / 4</td><td colspan="3">Final merging and scrutinising of report, return of Bo Ohlsson</td></tr>
<tr><td>11 / 4</td><td colspan="3">Printing of report and seminar preparation</td></tr>
<tr><td>12 / 4</td><td colspan="3">SUNDAY FREE (MS meet with Mr Chung at Hotel, 10 a.m.)</td></tr>
<tr><td>13 / 4</td><td colspan="3">Final seminar at FIPI (a.m.)</td></tr>
<tr><td>14 / 4</td><td colspan="3">Departure of SLU team</td></tr>
</table>

Annex B

Minutes from the Village Dialogue in Lang Ha on March 25, 1998

MINUTES FROM VILLAGE DIALOGUE ON MARCH 25, 1998 IN LANG HA

List of Participants:

From the Commune Office:

Mr Mieng (Cadastral Officer)
Mr Phien (Chairman, also Lang Ha village member)

Local farmers:

Mr Sing, (Village Chief)
Mme Lan
Mme Len, (Head Women's Association)
Mr Hanh
Mr Tin
Mr Thuy
Mr Que
Mr Ta (Elder)
Mr Duong (Elder)
Mr Chung
Mr Lu
Mr On (Elder)
Mr Khanh
Mr Tam (Farmers Assoc)
Mr Duong
Mme Binh
Mme Chinh

SLU-FIPI research team:

Mr Mats
Mr Bo
Mme Kajsa
Mr Chung
Mr Hung
Mme Binh

Program etc:

The meeting started at 9.00 and took place in the house of Mr Sing, the village leader. There were some 22 participants including four women.

Presentation/agenda
1) Village history including demographic development,
2) Land use history (including Lung Sa)
3) Current situation and analyse (with statements abut land use, activities etc)
4) Lunch (sponsored by the researchers and prepared by the village)
5) A final discussion about the future of the village (after lunch)

During the lunch, there were a few more people present - in the afternoon, a few less.

After post lunch discussion, we all went to a hill were we could overlook the village and discussed land use and village issues.

Around 15:30, maybe somewhat later, we said good bye and I think all had a good day. The Commune Chairman told Mr Chung that this was such a good idea that he will arrange "Village Dialogues" in other villages. It was quit a pleasant and

interesting day and we - I think - managed to confirm some of our data. I did also got the impression that this was the first time the villagers had considered their own village in the light of such an overview with consolidated village level data.

Mr Chung, Mr Phien, Mr Sing and Mr Hung are all preparing the lists of number of household members for each household plus a list of land/paddy use per household. This one has been long in getting, probably because they do not really have a consolidated list.

Point 1 – Village history (presented by Kajsa and Mme Binh)

Comments: Education was stressed by the audience. When 10 years old, children can go to school in Ban Lau. However, necessary to get school and road to village on the upper terrace. School should be located in the middle of the upper terrace. Shopping list (other priorities of the villagers): health care, school, road for education - and also economic development.

Point 2 – Land use history and Lung Sa (Mats and Mr Hung)

Question: Any land use proposal for Lung Sa and for the village?

Mr Ta - which soils do we have, what can grow well - we want technical guidance and advice.

Mme Len - Paddy inside enough to supply the whole village. Conditions are that all use fertilisers, pesticides, high yielding varieties and good irrigation practices. Plus fruit trees, perennial trees.

Question: Some hh have not enough money and other resources to buy fertilisers etc. What to do?

Old man - Current living standard is too low to do the above - there is not enough money available with many households. Fertilisers need big funds and also good knowledge on how to apply it.

Question: Where is the knowledge?

Mme Len - The true situation, land is not enough. In village we can share knowledge. Other problems: In each hamlet - you can see other hh, you can learn from them - no problems. But shortage of funds prevents proper use of resources. Even if we learn, we cannot do! About 2010 - some can do/achieve results but many have difficulties.

Point 3 – Current situation - analyse (Bo and Mr Chung):

Comments:

Middle aged farmer/active:

- For the young - grew fruit trees, it is not enough to go for short term crops.
- Young people must be aware of contribution of application of technical etc. and knowledge (for good yields)
- His family wants to stay here, likes Lang Ha and wants to try to contribute to the local community.
- Young people should contribute to improve the infrastructure of the village
- Proposal - the Commune should enable the young to travel to places with good examples to get ideas.

Mr Sing (village chief):

Some important issues

1. Re existing land use - enough land for cultivation. It is important that people understand good land use, have a good spirit.
2. The household is the core of rural development.
3. Do not expect resources from the outside
4. Why are some households rich and some poor?
5. Re crops - focus on perennial crops, fruit trees for sustainable development and also short term to sustain ourselves.
6. Water supply - be careful. Irrigation not very well developed in the village, much more could be done. Presently Long Tung - must be organised and improved.

Mr Lu - six children:

1. Emphasised the need to go for dry land farming and try new crops. People are too focused on rice cultivation, 1 crop, 2 crops etc.
2. Think of soil improvement, soil management which will improve the soils as well as new species.
3. Lung Sa - only for cash, not food security. Lung Sa is the reason why people are not developing inside land properly. Lung Sa prevents innovations and investments inside. Traditional methods in order to get modern things.
4. Family planning imperative - look at me, six kids!
5. More attention should be paid to forestry
6. Upgrade livestock, stall feeding, fodder grasses. 1 ton unhusked rice = 1 million VND. 1 cow more, 2 pigs as well!!
7. Re existing land - we have the knowledge, it is available in the village. Mainly, we require funds now.
8. The Red Book very important as it will give secure access to land, will facilitate and support investments.
9. Why so few economic activities??

Mr Tam, Farmers Association leader:

1. Red Book will enable us to focus on fixed cultivation inside. Maybe also outside, I did not understand.
2. Land is the basis
3. Very important to use new species such as potato, sweet potato etc. Insects an be a problem but there are pesticides.
4. Avoid the rice imperative. It is possible to have three crops, using the paddy fields for something else.
5. Family planning very important
6. Agroforestry extension important and contains a lot of opportunities.

Re Land Allocation:

Mme Lan (adopted Kinh, one of the two "rich" families)

Land allocation good and necessary but implementation not so good. First step only included 20 30 % of the land. Much excluded , not only paddy field but also other fields, slope and. Some people did go away during the land allocation in order to avoid having to point out land. Now this was first step, next step will be better because people were now more confident.

Womens´ situation: now mobilisation for agriculture / Development of economic activities such as handicraft during slack agricultural seasonal/development work. Then husband must also help, must also take household responsibilities.

Annex C

Land allocation in Lang Ha according to the Red Book

How to read the table:

The table has been produced by hand copying and re-writing the information on land allocation in Lang Ha according to the read book. (Writing errors could possibly have occurred in the process of reproducing the data).

Column 1: Ethnic belonging of the household (D = Dzao, K = Kinh)

Column 2: Number given each household in the Red Book.

Column 3-4: Total area and number of plots used by each household respectively

Column 5-6: Total allocated area and number of plots within village boundaries

Column 7-8: Allocated area (upland) and number of plots outside village boundaries

Column 9: Area of registered but not allocated paddy fields (inside)

Column 10: Total area of paddy fields (inside)

Column 11: Area of allocated paddy fields (inside)

Column 12: Number of allocated plots of paddy field

Column 13: Allocated area of upland fields (inside)

Column 14: Number of allocated upland plots (inside)

Land allocation in Lang Ha village, Ban Lau commune, Mounghh Koungh District, Lao Cai Province, Vietnam													
Ethn.	HH No	Grand total		Inside, total		Upland, outside		Paddy rice, inside		Paddy rice, inside		Upland, Inside	
		Area, m2	No of plots	Area, m2	No of plots	Area, m2	No of plots	and "extra"	Total paddy	Area, m2	No of plots	Area, m2	No of plots
D	1	33,130	9	10,730	7	26,410	2	875	2,605	1,730	6	9,000	1
D	2	19,820	11	19,820	11			875	2,695	1,820	9	18,000	2
D	3	28,000	13	28,000	13			1,500	3,550	2,050	9	25,950	4
D	4	18,005	6	18,005	2			-	1,006	1,006	4	17,000	2
K	5	18,900	5	18,900	5			750	1,650	900	2	18,000	3
K	6	61,215	9	61,215	9			1,875	4,090	2,215	7	59,000	2
K	7	26,000	3	26,000	3			825	825			26,000	3
K	8	6,782	2	6,782	2			875	1,657	782	1	6,000	1
D	9	5,600	2	5,600	2			-	-			5,600	2
D	10	10,984	6	10,984	6			-	984	984	4	10,000	2
D	11	12,452	9	12,452	9			3,750	6,202	2,452	8	10,000	1
D	12	705	4	705	4			-	705	705	3		
K	13	360	1	360	1			-	360	360	1		
D	14	2,192	7	2,192	7			625	2,817	2,192	7		
K	15	1,257	4	1,257	4			-	1,257	1,257	4		
D	16	6,073	6	6,073	6			-	1,076	1,076	5	5,000	1
D	17	51,605	10	10,000	1	40,000	1	-	1,605	1,605	8	10,000	1
D	18	20,545	9	20,545	9			2,400	4,345	1,945	8	18,600	1
D	19	1,218	3	1,218	3			1,250	2,468	1,218	3		
D	20	43,787	26	35,787	25	8,000	1	2,500	5,287	2,787	23	33,000	2
D	21	16,164	5	1,164	3	15,000	2	-	1,164	1,164	3		
D	22	890	3	890	3			-	890	890	3		
K	23	15,876	7	15,876	7			2,125	4,001	1,876	5	14,000	2
K	24	26,425	12	26,425	12			1,878	4,603	2,725	9	23,700	3
D	25	2,385	24	2,385	24			875	3,260	2,385	24		
K	26	16,754	16	16,754	16			1,875	3,629	1,754	13	15,000	2
D	27	2,045	7	2,045	7			1,500	3,545	2,045	7		
D	28	2,103	5	2,103	5			-	2,103	2,103	5		
D	29	1,125	5	1,125	5			875	2,000	1,125	5		
D	30	18,070	8	18,070	8			875	2,145	1,270	7	16,800	1

D	31	28,500	7	1,500	4	27,000	3	1,500	3,000	1,500	4		
D	32	3,680	4	3,680	4			-	880	880	3	2,800	1
K	33	31,996	11	2,996	9	29,000	2	2,500	5,496	2,996	9		
D	34	391	2	391	2			-	391	391	2		
D	35	15,522	5	1,522	3	14,000	2	1,000	2,522	1,522	3		
D	36	8,000	1			8,000	1	1,625	1,625				
K	37	27,825	10	27,825	10			1,875	3,600	1,725	7	26,100	3
K	38	8,030	7	8,030	7			2,125	2,875	750	5	7,280	2
K	39	25,894	5	25,894	5			500	1,421	921	3	25,000	2
	Total	620,305	289	455,300	263	167,410	14	39,228	94,334	55,106	229	401,830	44
Av. size/plot,m2		2,146		1,575		11,958				241		9,133	
Av. size/hh, m2		15,905		11,674		4,293		1,032	2,482	1,413		10,303	
Av. no of plots/hh			7		7			0.4			6		1
D= Dao household			"extra" = registered but not allocated paddy land										
K= Kinh household													

Annex D

APM Scenarios for Lang Ha

(Computer printouts)

Data set

Description: Ban Lau- Scenario 1

District	MK - Lang Ha Village	
Country	Vietnam - Lao Cai	
Land area	262	
Years	1970	2020

1 ton agriculture residue to Giga Calories (GCal)	1,2
1 cubic meter solid wood to Giga Calories (GCal)	2,6
1 cubic meter solid wood to 1 forest cubic meter	1,0

Land use transfer priorities

Other land, potential agriculture land	4
Farm forest land, natural forests	1
Other land, potential forest land	2
Industrial forest land, natural forests	6
Nat. environmental forest, in-accessible	5
Nat. environmental forest, protection areas	3
Nat. environmental forest, rerserves and NP	7

Growth factors, start value and period growth in %.

Total population	31	9,90	9,50	0,10	9,90	6,50	6,50	3,00	3,00	2,50	2,50
Rural population	31	9,90	9,50	0,10	9,90	6,50	6,50	3,00	3,00	2,50	2,50
Gross Domestic Product	60	1,00	1,00	1,00	5,00	5,00	5,00	5,00	5,00	3,00	3,00
Production subsistence food	1 500	1,00	1,00	1,00	6,00	6,00	5,00	5,00	5,00	4,00	4,00
Production marketed food	500	1,00	1,00	1,00	1,00	1,00	1,00	2,00	2,00	2,00	2,00
Production cash crop	4 000	0,00	0,00	0,00	1,00	1,00	1,00	3,00	3,00	3,00	3,00
Rur. biomass energy demand	3	0,00	0,00	0,00	0,00	0,00	0,00	1,00	1,00	1,00	1,00
Urb. biomass energy demand	2	0,00	0,00	0,00	0,00	0,00	0,00	-2,00	-2,00	-2,00	-2,00

Agriculture data

Agriculture land	Area (hectares)	Volume wood per hectare	Autoproduction of wood m^3/ hectare and year	Yield of residues kg per hectare	Amount of residues used as fuelwood (%)
Subsistence food	7	10	0,02	200	100
Marketed food	61	10	0,03	300	100
Cash Crop	2	0	0,1		100

Other land

Potential agricultural		10	0,2
Potential forest	44	10	0,2
Unproductive	5	2	0,1

Forest data

I Unavailable for production	Area (hectares)	MAI m^3	Ann fuel wood removal m^3	Ann. Logging m^3/ hectare	Total volume in m^3 per ha	altogether	Commercial volume in m^3 per ha	altogether
NP and reserves		0	0		4			
Protection	16	0,2	0,2		3			
Inaccessible areas		0	0		2			
Existing plantations	0							
II Available for production								
Industrial		2	0,5	0,5	60	60	20	
Existing plantations								
Farm forest	127	0,2	0,2	0	10	10	2	
Existing plantations								

Population & GDP

Year	Population			Gross Domestic Product	
	Rural	Urban	Total	Total (in millions)	Per capita
1970	31		31	0	60
1971	34		34	0	61
1972	37		37	0	61
1973	41		41	0	62
1974	45		45	0	62
1975	50		50	0	63
1976	54		54	0	64
1977	60		60	0	64
1978	65		65	0	65
1979	71		71	0	66
1980	78		78	0	66
1981	78		78	0	67
1982	78		78	0	68
1983	78		78	0	68
1984	79		79	0	69
1985	79		79	0	70
1986	86		86	0	73
1987	95		95	0	77
1988	104		104	0	81
1989	115		115	0	85
1990	126		126	0	89
1991	134		134	0	93
1992	143		143	0	98
1993	152		152	0	103
1994	162		162	0	108
1995	173		173	0	113
1996	184		184	0	119
1997	196		196	0	125
1998	209		209	0	131
1999	222		222	0	138
2000	237		237	0	145
2001	244		244	0	152
2002	251		251	0	160
2003	259		259	0	168
2004	266		266	0	176
2005	274		274	0	185
2006	283		283	0	194
2007	291		291	0	204
2008	300		300	0	214
2009	309		309	0	225
2010	318		318	0	236
2011	326		326	0	243
2012	334		334	0	250
2013	342		342	0	258
2014	351		351	0	265
2015	360		360	0	273
2016	369		369	0	282
2017	378		378	0	290
2018	387		387	0	299
2019	397		397	0	308
2020	407		407	0	317

Agriculture development

Year	Subsistence food		Marketed Food		Cash Crop		Accumulated
	Area	Production/Ha	Area	Production/Ha	Area	Production/Ha	transfer
1970	7	1 500	61	500	2	4 000	0
1971	8	1 515	61	505	2	4 000	1
1972	8	1 530	61	510	2	4 000	1
1973	9	1 545	61	515	3	4 000	3
1974	10	1 561	61	520	3	4 000	4
1975	11	1 577	61	526	3	4 000	5
1976	12	1 592	61	531	4	4 000	7
1977	13	1 608	61	536	4	4 000	8
1978	14	1 624	61	541	5	4 000	10
1979	15	1 641	61	547	5	4 000	11
1980	16	1 657	61	552	6	4 000	13
1981	16	1 674	61	558	6	4 000	13
1982	16	1 690	61	563	6	4 000	13
1983	16	1 707	61	569	6	4 000	13
1984	15	1 724	61	575	6	4 000	12
1985	15	1 741	61	580	6	4 000	12
1986	16	1 846	63	586	7	4 040	16
1987	16	1 957	66	592	8	4 080	20
1988	17	2 074	69	598	9	4 121	25
1989	18	2 199	71	604	10	4 162	29
1990	18	2 330	74	610	11	4 204	33
1991	18	2 470	77	616	13	4 246	38
1992	18	2 619	80	622	14	4 289	42
1993	19	2 776	83	629	16	4 331	48
1994	19	2 942	87	635	17	4 375	53
1995	19	3 119	90	641	19	4 418	58
1996	19	3 275	93	654	21	4 463	63
1997	19	3 438	95	667	23	4 507	67
1998	20	3 610	98	680	26	4 552	74
1999	20	3 791	101	694	29	4 598	80
2000	20	3 980	104	708	32	4 644	86
2001	20	4 179	107	722	33	4 783	90
2002	19	4 388	110	737	35	4 927	94
2003	19	4 608	113	751	37	5 074	99
2004	19	4 838	117	766	39	5 227	105
2005	18	5 080	120	782	41	5 384	109
2006	18	5 334	124	797	43	5 545	115
2007	18	5 601	127	813	45	5 711	120
2008	17	5 881	131	829	47	5 883	125
2009	17	6 175	135	846	49	6 059	131
2010	17	6 484	139	863	52	6 241	138
2011	16	6 743	140	880	53	6 428	139
2012	16	7 013	142	898	54	6 621	142
2013	16	7 293	143	916	56	6 820	145
2014	16	7 585	144	934	57	7 024	147
2015	15	7 888	146	953	58	7 235	149
2016	15	8 204	147	972	60	7 452	152
2017	15	8 532	149	991	61	7 676	155
2018	15	8 873	150	1 011	63	7 906	158
2019	15	9 228	152	1 031	65	8 143	162
2020	14	9 597	153	1 052	66	8 387	163

Land use transfers

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Year	Accumulated transfer	Remaining area after land transfer, classes as listed above. 1	2	3	4	5	6	7
1970	0	127	44	16	0	0	0	0
1971	1	126	44	16	0	0	0	0
1972	1	126	44	16	0	0	0	0
1973	3	124	44	16	0	0	0	0
1974	4	123	44	16	0	0	0	0
1975	5	122	44	16	0	0	0	0
1976	7	120	44	16	0	0	0	0
1977	8	119	44	16	0	0	0	0
1978	10	117	44	16	0	0	0	0
1979	11	116	44	16	0	0	0	0
1980	13	114	44	16	0	0	0	0
1981	13	114	44	16	0	0	0	0
1982	13	114	44	16	0	0	0	0
1983	13	114	44	16	0	0	0	0
1984	12	115	44	16	0	0	0	0
1985	12	115	44	16	0	0	0	0
1986	16	111	44	16	0	0	0	0
1987	20	107	44	16	0	0	0	0
1988	25	102	44	16	0	0	0	0
1989	29	98	44	16	0	0	0	0
1990	33	94	44	16	0	0	0	0
1991	38	89	44	16	0	0	0	0
1992	42	85	44	16	0	0	0	0
1993	48	79	44	16	0	0	0	0
1994	53	74	44	16	0	0	0	0
1995	58	69	44	16	0	0	0	0
1996	63	64	44	16	0	0	0	0
1997	67	60	44	16	0	0	0	0
1998	74	53	44	16	0	0	0	0
1999	80	47	44	16	0	0	0	0
2000	86	41	44	16	0	0	0	0
2001	90	37	44	16	0	0	0	0
2002	94	33	44	16	0	0	0	0
2003	99	28	44	16	0	0	0	0
2004	105	22	44	16	0	0	0	0
2005	109	18	44	16	0	0	0	0
2006	115	12	44	16	0	0	0	0
2007	120	7	44	16	0	0	0	0
2008	125	2	44	16	0	0	0	0
2009	131	0	40	16	0	0	0	0
2010	138	0	33	16	0	0	0	0
2011	139	0	32	16	0	0	0	0
2012	142	0	29	16	0	0	0	0
2013	145	0	26	16	0	0	0	0
2014	147	0	24	16	0	0	0	0
2015	149	0	22	16	0	0	0	0

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Year	Accumulated transfer	Remaining area after land transfer, classes as listed above. 1	2	3	4	5	6	7
2016	152	0	19	16	0	0	0	0
2017	155	0	16	16	0	0	0	0
2018	158	0	13	16	0	0	0	0
2019	162	0	9	16	0	0	0	0
2020	163	0	8	16	0	0	0	0

Land use transfers

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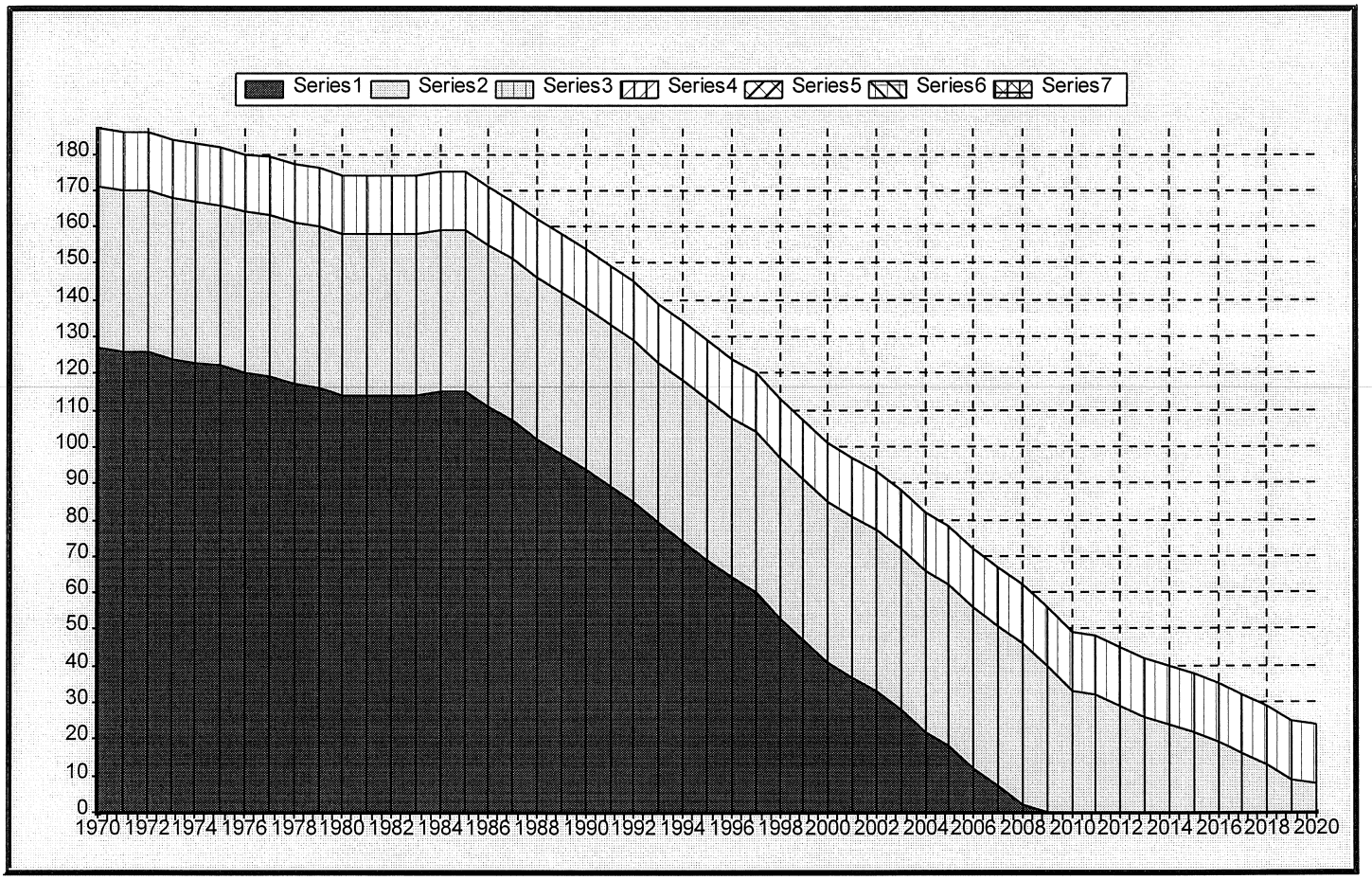

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Data set

Description: Ban Lau- Scenario 2

District	MK - Lang Ha Village	
Country	Vietnam - Lao Cai	
Land area	99	
Years	2000	2020

1 ton agriculture residue to Giga Calories (GCal)	1,2
1 cubic meter solid wood to Giga Calories (GCal)	2,6
1 cubic meter solid wood to 1 forest cubic meter	1,0

Land use transfer priorities

Other land, potential agriculture land	1
Farm forest land, natural forests	2
Other land, potential forest land	3
Industrial forest land, natural forests	4
Nat. environmental forest, in-accessible	5
Nat. environmental forest, protection areas	6
Nat. environmental forest, rerserves and NP	7

Growth factors, start value and period growth in %.

Total population	177	2,00	2,00	1,80	1,80
Rural population	177	2,00	2,00	1,80	1,80
Gross Domestic Product	220	2,50	2,50	2,00	2,00
Production subsistence food	4 200	0,30	0,30	0,20	0,20
Production marketed food	2 200	0,00	0,00	0,00	0,00
Production cash crop	10 000	4,00	4,00	3,00	3,00
Rur. biomass energy demand	3	1,00	1,00	1,00	1,00
Urb. biomass energy demand	2	-2,00	-2,00	-2,00	-2,00

Agriculture data

Agriculture land	Area (hectares)	Volume wood per hectare	Autoproduction of wood m^3/ hectare and year	Yield of residues kg per hectare	Amount of residues used as fuelwood (%)
Subsistence food	6	10	0,02	200	100
Marketed food	17	10	0,03	300	100
Cash Crop	33	0	0,1		100
Other land					
Potential agricultural	17	10	0,2		
Potential forest		10	0,2		
Unproductive	3	2	0,1		

Forest data

I Unavailable for production	Area (hectares)	MAI m^3	Ann fuel wood removal m^3	Ann. Logging m^3/ hectare	Total volume in m^3 per ha	Total volume in m^3 altogether	Commercial volume in m^3 per ha	Commercial volume in m^3 altogether
NP and reserves								
Protection								
Inaccessible areas								
Existing plantations	0							
II Available for production								
Industrial								
Existing plantations								
Farm forest	23	0,2	0,2	0	10	10	2	
Existing plantations								

Population & GDP

Year	Population			Gross Domestic Product	
	Rural	Urban	Total	Total (in millions)	Per capita
2000	177		177	0	220
2001	181		181	0	225
2002	184		184	0	231
2003	188		188	0	237
2004	192		192	0	243
2005	195		195	0	249
2006	199		199	0	255
2007	203		203	0	262
2008	207		207	0	268
2009	212		212	0	275
2010	216		216	0	282
2011	220		220	0	287
2012	224		224	0	293
2013	228		228	0	299
2014	232		232	0	305
2015	236		236	0	311
2016	240		240	0	317
2017	244		244	0	323
2018	249		249	0	330
2019	253		253	0	337
2020	258		258	0	343

Agriculture development

Year	Subsistence food		Marketed Food		Cash Crop		Accumulated
	Area	Production/Ha	Area	Production/Ha	Area	Production/Ha	transfer
2000	6	4 200	17	2 200	33	10 000	0
2001	6	4 213	17	2 200	33	10 400	0
2002	6	4 225	18	2 200	33	10 816	1
2003	6	4 238	18	2 200	34	11 249	2
2004	6	4 251	19	2 200	34	11 699	3
2005	7	4 263	19	2 200	34	12 167	4
2006	7	4 276	20	2 200	34	12 653	5
2007	7	4 289	20	2 200	34	13 159	5
2008	7	4 302	21	2 200	34	13 686	6
2009	7	4 315	21	2 200	35	14 233	7
2010	7	4 328	22	2 200	35	14 802	8
2011	7	4 336	22	2 200	35	15 247	8
2012	7	4 345	23	2 200	35	15 704	9
2013	7	4 354	23	2 200	36	16 175	10
2014	8	4 362	24	2 200	36	16 660	12
2015	8	4 371	24	2 200	36	17 160	12
2016	8	4 380	25	2 200	37	17 675	14
2017	8	4 389	25	2 200	37	18 205	14
2018	8	4 397	25	2 200	37	18 751	14
2019	8	4 406	26	2 200	37	19 314	15
2020	8	4 415	27	2 200	38	19 893	17

Land use transfers

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Year	Accumulated transfer	Remaining area after land transfer, classes as listed above. 1	2	3	4	5	6	7
2000	0	17	21	0	0	0	0	0
2001	0	17	21	0	0	0	0	0
2002	1	16	21	0	0	0	0	0
2003	2	15	21	0	0	0	0	0
2004	3	14	21	0	0	0	0	0
2005	4	13	23	0	0	0	0	0
2006	5	12	23	0	0	0	0	0
2007	5	12	23	0	0	0	0	0
2008	6	11	23	0	0	0	0	0
2009	7	10	23	0	0	0	0	0
2010	8	9	23	0	0	0	0	0
2011	8	9	23	0	0	0	0	0
2012	9	8	23	0	0	0	0	0
2013	10	7	23	0	0	0	0	0
2014	12	5	23	0	0	0	0	0
2015	12	5	23	0	0	0	0	0
2016	14	3	23	0	0	0	0	0
2017	14	3	23	0	0	0	0	0
2018	14	3	23	0	0	0	0	0
2019	15	2	23	0	0	0	0	0
2020	17	0	23	0	0	0	0	0

Land use transfers

Series 1 = Other land, potential agriculture land
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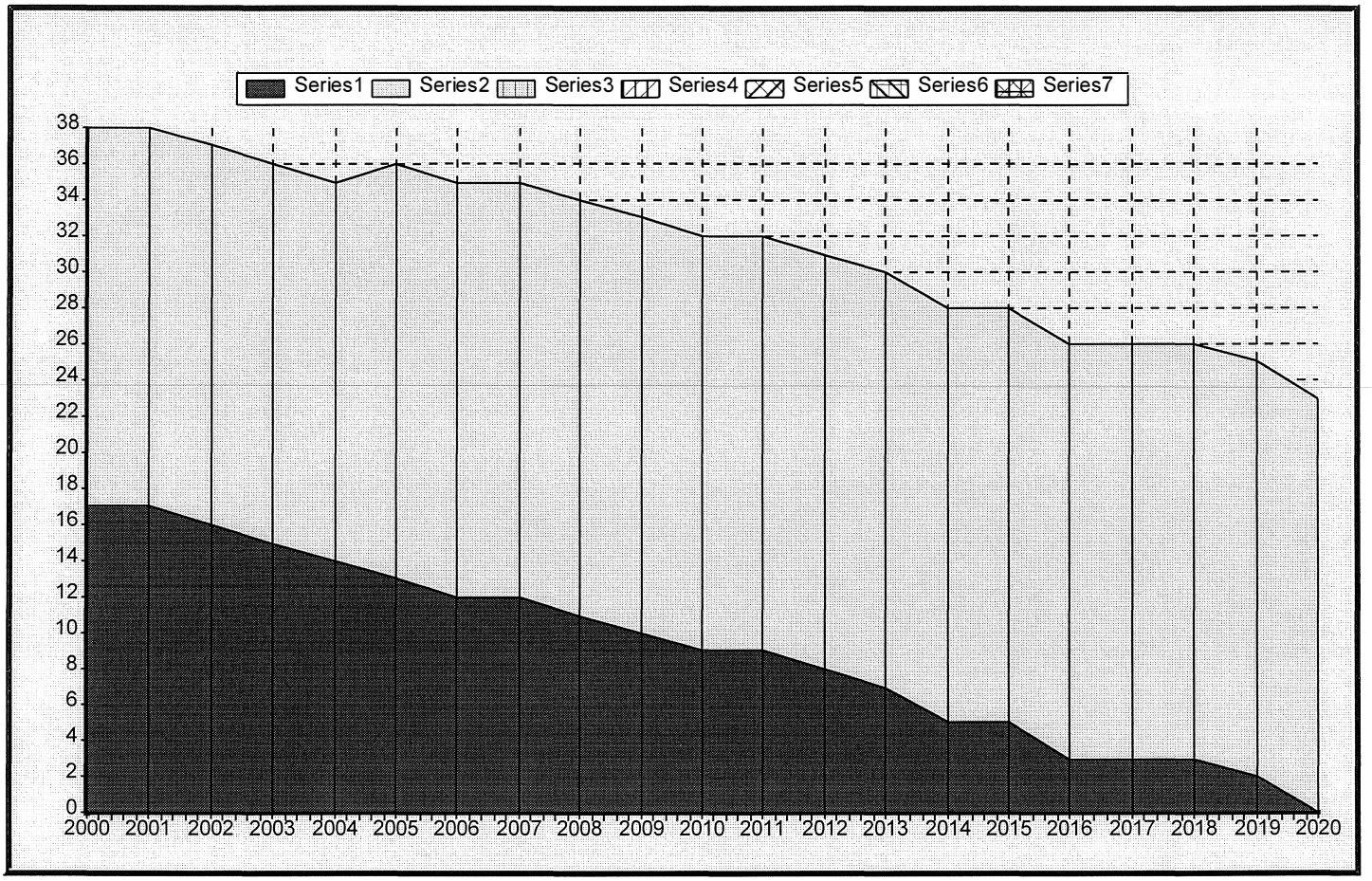

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Serien Arbetsrapporter utges i första hand för institutionens eget behov av viss dokumentation. Rapporterna är indelade i följande grupper: Riksskogstaxeringen, Planering och inventering, Biometri, Fjärranalys, Kompendier och undervisningsmaterial, Examensarbeten samt Internationellt. Författarna svarar själva för rapporternas vetenskapliga innehåll.

Riksskogstaxeringen:

1995 1 Kempe, G. Hjälpmedel för bestämning av slutenhet i plant- och ungskog. ISRN SLU-SRG-AR--1--SE

2 Riksskogstaxeringen och Ståndortskarteringen vid regional miljöövervakning. - metoder för att förbättra upplösningen vid inventering i skogliga avrinningsområden. ISRN SLU-SRG-AR--2--SE.

1997 23 Lundström, A., Nilsson, P. & Ståhl, G. Certifieringens konsekvenser för möjliga uttag av industri- och energived. - En pilotstudie. ISRN SLU-SRG-AR--23--SE.

24 Fridman, J. & Walheim, M. Död ved i Sverige. - Statistik från Riksskogstaxeringen. ISRN SLU-SRG-AR--24--SE.

1998 30 Fridman, J., Kihlblom, D. & Söderberg, U. Förslag till miljöindexsystem för naturtypen skog. ISRN SLU-SRG-AR--30--SE.

34 Löfgren, P. Skogsmark, samt träd- och buskmark inom fjällområdet. En skattning av arealer enligt internationella ägoslagsdefinitioner. ISRN SLU-SRG-AR--34--SE.

37 Odell, G. & Ståhl, G. Vegetationsförändringar i svensk skogsmark mellan 1980- och 90-talet. -En studie grundad på Ståndortskarteringen. ISRN SLU-SRG-AR--37--SE.

38 Lind, T. Quantifying the area of edge zones in Swedish forest to assess the impact of nature conservation on timber yields. ISRN SLU-SRG-AR--38--SE.

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1995 3 Holmgren, P. & Thuresson, T. Skoglig planering på amerikanska västkusten - intryck från en studieresa till Oregon, Washington och British Columbia 1-14 augusti 1995. ISRN SLU-SRG-AR--3--SE.

4 Ståhl, G. The Transect Relascope - An Instrument for the Quantification of Coarse Woody Debris. ISRN SLU-SRG-AR--4--SE.

1996 15 van Kerkvoorde, M. A sequential approach in mathematical programming to include spatial aspects of biodiversity in long range forest management planning. ISRN SLU-SRG-AR--15--SE.

1997 18 Christoffersson, P & Jonsson, P. Avdelningsfri inventering - tillvägagångssätt och tidsåtgång. ISRN SLU-SRG-AR--18--SE.

19 Ståhl, G., Ringvall, A. & Lämås, T. Guided transect sampling - An outline of the principle. ISRN SLU-SRG-AR--19--SE.

25 Lämås, T. & Ståhl, G. Skattning av tillstånd och förändringar genom inventerings simulering - En handledning till programpaketet "NVSIM". ISRN SLU-SRG-AR--25--SE

26 Lämås, T. & Ståhl, G. Om dektektering av förändringar av populationer i begränsade områden. ISRN SLU-SRG-AR--26--SE

Biometri:

1997 22 Ali, Abdul Aziz. Describing Tree Size Diversity. ISRN SLU-SRG-AR--22--SE.

Fjärranalys:

1997 28. Hagner, O. Satellitfjärranalys för skogsföretag. ISRN SLU-SRG-AR--28--SE.

29. Hagner, O. Textur i flygbilder för skattning av beståndsegenskaper. ISRN SLU-SRG-AR--29--SE.

1998 32. Dahlberg, U., Bergstedt, J. & Pettersson, A. Fältinstruktion för och erfarenheter från vegetationsinventering i Abisko, sommaren 1997. ISRN SLU-SRG-AR--32--SE.

43 Wallerman, J. Brattåkerinventeringen. ISRN SLU-SRG-AR--32--SE.

Kompendier och undervisningsmaterial:

1996 14 Holm, S. & Thuresson, T. samt jägm.studenter kurs 92/96. En analys av skogstillståndet samt några alternativa avverkningsberäkningar för en del av Östads säteri. ISRN SLU-SRG-AR--14--SE.

21 Holm, S. & Thuresson, T. samt jägm.studenter kurs 93/97. En analys av skogstillståndet samt några alternativa avverkningsberäkningar för en stor del av Östads säteri. ISRN SLU-SRG-AR--21--SE.

1998 42 Holm, S. & Lämås, T. samt jägm.studenter kurs 93/97. An analysis of the state of the forest and of some management alternatives for the Östad estate. ISRN SLU-SRG-AR--42--SE.

Examensarbeten:

1995 5 Törnquist, K. Ekologisk landskapsplanering i svenskt skogsbruk - hur började det?. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--5--SE.

1996 6 Persson, S. & Segner, U. Aspekter kring datakvaliténs betydelse för den kortsiktiga planeringen. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--6--SE.

7 Henriksson, L. The thinning quotient - a relevant description of a thinning? Gallringskvot - en tillförlitlig beskrivning av en gallring? Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--7--SE.

8 Ranvald, C. Sortimentsinriktad avverkning. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--8--SE.

9 Olofsson, C. Mångbruk i ett landskapsperspektiv - En fallstudie på MoDo Skog AB, Örnsköldsviks förvaltning. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--9--SE.

10 Andersson, H. Taper curve functions and quality estimation for Common Oak (Quercus Robur L.) in Sweden. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--10--SE.

11 Djurberg, H. Den skogliga informationens roll i ett kundanpassat virkesflöde. - En bakgrundsstudie samt simulering av inventeringsmetoders inverkan på noggrannhet i leveransprognoser till sågverk. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--11--SE.

12 Bredberg, J. Skattning av ålder och andra beståndsvariabler - en fallstudie baserad på MoDo:s indelningsrutiner. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--12--SE.

13 Gunnarsson, F. On the potential of Kriging for forest management planning. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--13--SE.

16 Tormalm, K. Implementering av FSC-certifiering av mindre enskilda markägares skogsbruk. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--16--SE.

1997 17 Engberg, M. Naturvärden i skog lämnad vid slutavverkning. - En inventering av upp till 35 år gamla föryngringsytor på Sundsvalls arbetsområde, SCA. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN-SRG-AR--17--SE.

20 Cedervind, J. GPS under krontak i skog. Examensarbete i ämnet skogsuppskattning och skogsindelning. ISRN SLU-SRG-AR--20--SE.

27 Karlsson, A. En studie av tre inventeringsmetoder i slutavverkningsbestånd. Examensarbete. ISRN SLU-SRG-AR--27--SE.

1998 31 Bendz, J. SÖDRAs gröna skogsbruksplaner. En uppföljning relaterad till SÖDRAs miljömål, FSC's kriterier och svensk skogspolitik. Examensarbete. ISRN SLU-SRG-AR--31--SE.

33 Jonsson, Ö. Trädskikt och ståndortsförhållanden i strandskog. - En studie av tre bäckar i Västerbotten. Examensarbete. ISRN SLU-SRG-AR--33--SE.

35 Claesson, S. Thinning response functions for single trees of Common oak (Quercus Robur L.) Examensarbete. ISRN SLU-SRG-AR--35--SE.

36 Lindskog, M. New legal minimum ages for final felling. Consequences and forest owner attitudes in the county of Västerbotten. Examensarbete. ISRN SLU-SRG-AR--36--SE.

1998 40 Persson, M. Skogsmarksindelningen i gröna och blå kartan - en utvärdering med hjälp av riksskogstaxeringens provytor. ISRN SLU-SRG-AR--40--SE.

41 Eriksson, F. Markbaserade sensorer för insamling av skogliga data - en förstudie. ISRN SLU-SRG-AR--41--SE.

Internationellt

1998 39 Sandewall, M ., Ohlsson, B & Sandewall, R.K. People´s options on forest land use. - a research study of land use dynamics and socio-economic conditions in a historical perspective in the Upper Nam Nan Water Catchment Area, Lao PDR. ISRN SLU-SRG-AR--39--SE.

1998 44 Sandewall, M., Ohlsson, B., Sandewall, R.K., Vo Chi Chung, Tran Thi Binh & Pham Quoc Hung. People´s options on forest land use. Government plans and farmers intentions - a strategic dilemma. ISRN SLU-SRG-AR--44--SE.