ANALYSIS OF LAND ALLOCATION AND IMPLICATIONS
ON LAND MANAGEMENT:
A case study of two villages in Sang Thong district,
Vientiane municipality, Lao PDR

By
Iris Evelin Funke
Born in Arnstadt, Germany

A thesis submitted in partial fulfilment of the examination requirements for the
award of academic degree of
Master of Science (Tropical Forestry) - MSc forest. trop.

Faculty of Forest, Geo and Hydro Sciences of
Dresden University of Technology
Tharandt, Germany

Date of submission: 22 February 2001
Scientific supervisor: Prof. Dr. habil. Holm Uibrig, TU Dresden
Co-supervisor: Dr. Jürgen Hess, GTZ
Institute: Institute of International Forestry and Forest Products

Tharandt, February 2001
Acknowledgements

The thesis was prepared at the Institute of International Forestry and Forest Products of the Faculty of Forest, Geo and Hydro Sciences of Dresden University of Technology in the years 1999 and 2000.

My thanks are dedicated to Prof. Dr. Uibrig who was the scientific supervisor of this work. I am grateful for his professional assistance and his patience. My sincerest thanks apply also to Dr. Jürgen Hess who did the co-supervision.

The field work was conducted within the framework of the National University of Laos and the Lao-German Project "PROFEP" of GTZ. I express my deepest gratitude to Dr. Walter Kollert and Mr Soukkongseng Saignaleuth for their invaluable co-operation and support. My thanks are extended to Mr Dietmar Bräutigam, Mr Khamla Phanvilay and Mr Lamphoune Xayvongsa for their professional hints and their engagement in discussions. Special thanks are dedicated to Mr Thavy Phimminith for help and guidance during the stay in the field.

Cordial thanks I send to Jürgen, Susanne and Louisa Hess for giving me true friendship and a feeling of being "at home" during my stay in Laos.

The families in the villages Napo and Khokpheun deserve my special gratefulness for their grand hospitality, aid, openness and understanding. I do very much hope, that all the knowledge they patiently shared with me, will be used to their benefit.

I am also deeply indebted to the German Academic Exchange Service (DAAD) and the Förderungswerk of Carl Duisberg Centren who enabled this work through their financial support. In particular my vote of thanks is directed to Mr Ulrich Lottmann and Mr Andreas Rypcsinski for their advice and support.

Finally all my thanks and acknowledgements are extended to all friends who helped me at various stages of this work ...

Iris Funke
# Table of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>a</td>
</tr>
<tr>
<td>Table of contents</td>
<td>i</td>
</tr>
<tr>
<td>List of abbreviations</td>
<td>iii</td>
</tr>
<tr>
<td>Abstract</td>
<td>iv</td>
</tr>
<tr>
<td>1. Land tenure systems in the context of development</td>
<td>01</td>
</tr>
<tr>
<td>2. Research strategy</td>
<td>03</td>
</tr>
<tr>
<td>2.1. Theoretical setting</td>
<td>03</td>
</tr>
<tr>
<td>2.1.1. Research on land management</td>
<td>03</td>
</tr>
<tr>
<td>2.1.2. Application to villages under study</td>
<td>04</td>
</tr>
<tr>
<td>2.2. Methodology</td>
<td>05</td>
</tr>
<tr>
<td>2.2.1. Identification of the villages to be studied</td>
<td>05</td>
</tr>
<tr>
<td>2.2.2. Data collection</td>
<td>05</td>
</tr>
<tr>
<td>2.2.3. Data processing and analysis of the results</td>
<td>10</td>
</tr>
<tr>
<td>3. Legal regulations on land tenure and land use</td>
<td>12</td>
</tr>
<tr>
<td>3.1. Historical development of land tenure in the today's Lao PDR</td>
<td>12</td>
</tr>
<tr>
<td>3.2. Current legal regulations of land tenure</td>
<td>16</td>
</tr>
<tr>
<td>3.3. Regulations of land allocation</td>
<td>18</td>
</tr>
<tr>
<td>3.4. Legislation on the use of forests</td>
<td>25</td>
</tr>
<tr>
<td>3.5. Village forestry strategy</td>
<td>27</td>
</tr>
<tr>
<td>4. Land allocation – Process, results and discussion</td>
<td>30</td>
</tr>
<tr>
<td>4.1. The process of land allocation</td>
<td>30</td>
</tr>
<tr>
<td>4.1.1. The process of land allocation in Khokpheun</td>
<td>30</td>
</tr>
<tr>
<td>4.1.2. The process of land allocation in Napo</td>
<td>33</td>
</tr>
</tbody>
</table>
4.1.3. Comparative analysis of the process of land allocation in Khokpheun and Napo 35

4.2. Changes in tenure status and size of agricultural landholdings 40

4.3. Implications of land allocation on farm land use of households 45
   4.3.1. Changes in farm land use of households in the sample 45
   4.3.2. Transfer of land area of households to other households prior to land allocation 49
   4.3.3. Transformation of the land use type 52

4.4. Implications of land allocation on forest land 57
   4.4.1. Treatment of forests within the land allocation process 57
   4.4.2. Implications of land allocation on forest use in Napo and Khokpheun 60

5. Conclusions and recommendations 65
   5.1. The process of land allocation 65
   5.2. Land management 68
      5.2.1. Land information management 68
      5.2.2. Land resource management 69

References 72

List of tables 79
List of figures 80
List of illustrations 81
List of appendices 82
Appendices

Declaration 82
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUSO</td>
<td>Canadian University Service in Oversea</td>
</tr>
<tr>
<td>DAFO</td>
<td>District Agriculture and Forest Office</td>
</tr>
<tr>
<td>DDFD</td>
<td>Dong Dok Forestry Department</td>
</tr>
<tr>
<td>FOMACOP</td>
<td>Forest Management and Conservation Programme</td>
</tr>
<tr>
<td>GoL</td>
<td>Government of Laos</td>
</tr>
<tr>
<td>GTZ</td>
<td>Gesellschaft für Technische Zusammenarbeit mbH</td>
</tr>
<tr>
<td>HH</td>
<td>Households</td>
</tr>
<tr>
<td>JVC</td>
<td>Japanese Voluntary Service</td>
</tr>
<tr>
<td>LA</td>
<td>Land Allocation</td>
</tr>
<tr>
<td>LAC</td>
<td>Land Allocation Committee</td>
</tr>
<tr>
<td>LIS</td>
<td>Land Information System</td>
</tr>
<tr>
<td>MAF</td>
<td>Ministry of Agriculture and Forestry</td>
</tr>
<tr>
<td>MRC</td>
<td>Mekong River Commission</td>
</tr>
<tr>
<td>NEM</td>
<td>New Economic Mechanism</td>
</tr>
<tr>
<td>NUOL</td>
<td>National University of Laos</td>
</tr>
<tr>
<td>PAFO</td>
<td>Provincial Agriculture and Forestry Office</td>
</tr>
<tr>
<td>PROFEP</td>
<td>Promotion of Forestry Education Project</td>
</tr>
</tbody>
</table>
Abstract

End of the 1980th, the government of Lao PDR started with far-reaching reforms embracing transformations of the tenure system inclusive land tenure. Private property of land was legitimised. The implementation of the new legal regulations has been striven for by land allocation. Through land allocation land should be fairly distributed as well as intensive and permanent land use at local level should be initiated.

In this context, the research focuses on the complex problem of land management including land information management and resource management. Thereby land allocation is regarded as a tool to influence resource management at local level by the allocation of defined parcels of land to individual users and user groups. Additionally, the process of land allocation is referred to as a component part within the establishment of a land information system.

The field research referred to a case study approach based on various methods. Thereby especially interviewing and participatory observation were employed and combined with a review of legal prescriptions and official documents on land allocation in Laos and the respective villages. Two villages, located in Vientiane municipality, were selected. The survey of land tenure and land use as well as changes thereof concentrated on 64 households.

The findings of the investigation show, that land allocation took place in both of the surveyed villages. But the process of land allocation was only difficult and fragmentary in fathoming out. However the implementation of land allocation followed the legal guidelines and went along the lines of traditional usufruct rights. Land claimed by households and reported to the Land Allocation Committee was registered and temporary land certificates combined with land use agreements were conferred to the households. No official redistribution of land was observed. Besides this, a redistribution of land within the extended family prior to official registration could be ascertained.

Analysis of results on land use of households revealed that changes in land use took place related to the process of implementation of land allocation. In
Khokpheun, favourable localities and access to regional markets facilitate changes towards a more intensive and permanent land use and provide the farmers with good options for income generation in particular on cash crops. In the village Napo, due to hampering skeleton conditions (lack of water for irrigation, difficult access to markets), changes in land use towards intensification were marginally realised.

Forests and the use of forests was not and/or only indirectly affected by the land allocation as implemented in both villages. The demarcation of boundaries of villages and forest land as well as the determination of land use zones created fundamentals for preservation and controlled management of forest land. Forest land within the village boundaries was assigned to the village community. Concepts of Village Forestry were not implemented in the villages. Traditional use of village forest land for personal needs remains permitted.

Recommendations drawn from the results of the study are in favour of the continuation of land allocation and the creation of a Land Information System (LIS). Recommendations for further research focus on management of land information as well as on land resource management.
1. Land tenure systems in the context of development

Land tenure systems are connected to economic, political and social development. Thereby the insecurity in land tenure and lease is one of the most important problems. Implications of defined and accepted land tenure systems may contribute to the increase in production and productivity (sectoral approach) as well as to the improvement of living conditions of the rural population (regional approach) (GTZ, 1998).

In developing countries, land resources are often used as traditional informal common property (cf. WACHTER, 1992). There, the rights in land are claimed by groups which in the case of Laos are usually limited to a village community. Such constellations were often put on an equal status with systems of open access. With reference to resources of open access (without rights of tenure), HARDIN (1968) pointed out, that in such a case each user endeavours to maximise his profit from the resource on a short term. The profit is earned by the individual, whereas damage to the resource arising from overexploitation has to be shared by all users. For this, HARDIN (1968) coined the term "tragedy of the commons". It is applicable to a wide range of human interactions (OSTROM, 1999; p. 3) and can also be formulated as "prisoner's dilemma" (ib.). It seems relevant to rural development in Laos, too: If a user of agricultural land has no security to benefit from own means or long term investments in the form of labour or material input, he will not undertake such efforts. If a rural community concerning their common forest land has no security, which guarantees the benefits of long term investments as well as the benefits of use restrictions towards sustainability for the users or their descendants, the interest in preservation and maintenance of this resource will be low and their long term existence will not be ensured. Therefore, deficits in land tenure security decrease the basis for enhancement of agricultural production and productivity as well as for sustainable use of forests and rehabilitation of degraded forests. The sustainable use of resources, however, is a precondition for their long-term preservation. While this was mainly guaranteed by the low population density in Laos in the past, the traditional use of resources, in particular the types of shifting cultivation, will no longer satisfy the growing demands of an increasing population and will lead towards the destruction of resources.
Rural development in Laos focuses on productive permanent agriculture and deforestation control, while confining various forms of shifting cultivation at the same time. Based on this, individual agriculture and village forestry is under development. Village forestry is to elaborate and to implement planned and sustainable utilisation of forest land at village level.

In 1986 the Government of Laos started economic reforms. The reform of the agrarian sector, especially of the land tenure system, plays an important role in the agrarian country (share of agriculture in GDP 1996: 52%; NATIONAL STATISTICAL CENTRE, 1998). In this context, the allocation and registration mainly of agricultural land and the legal identification of land use types were introduced. Thus, a legal basis for individual and common land use was created in the Lao PDR for the first time.

After having completed some land allocation at village level, process of implementation, results of land allocation as well as the implications for future land tenure and use development have not been analysed yet. Therefore, this study is to examine the legal background of land tenure and allocation as well as the process and immediate results of land allocation. The analysis of land allocation includes the assessment of implications on land holdings and their utilisation. For this purpose, situations before and after land allocation within the territory of two selected villages will be analysed. Conclusions drawn are to serve further adaptation of land allocation to social reality and will especially focus on the Land Information System which is initiated to establish by land allocation. Recommendations will be drawn to continue land allocation and sustainable management of natural resources at village level following participatory approaches.

In this context, the following questions shall be answered:

1. How is land allocation carried out?
2. Which differences between customary and legal tenure of households can be ascertained?
3. Does land allocation influence the land use at village level?
4. Is land allocation a suitable tool to create and manage a land information system?
2. Research strategy

2.1. Theoretical setting

2.1.1. Research on land management

The research focuses on the complex problem of land management combining social, economic and political aspects. Previously conducted research in social science pointed out the problems linked with the use of common pool resources which are characterised by unsecured determination and demarcation of rights in use (HARDIN, 1968). Former conclusions from the "tragedy of the commons" led to two alternatives: uncompromising privatisation or central administration by outsiders (e.g. the state and its authorities) (HARDIN, 1978; SMITH 1981). Contrary to this, new approaches in social science (e.g. OSTROM, 1999) maintain, that on the basis of a suitable legal framework, which defines and protects the usufruct rights of a limited user group, the internal regulation of use and the sustainable management of resources can be realised by the user himself. Thereby, land management comprises three component parts: (1) land information management, (2) resource management and (3) land administration arrangements (cf. DALE; MC LAUGHLIN, 1990, p. 4).

Generally, the design of a land information management system is either dedicated to one principal function or it is multifunctional. At the initial stage a land information system in Laos complies with the requirements of land taxation (fiscal cadastre). DALE and MC LAUGHLIN (1990), summarise the functions of a fiscal cadastre as follows: "(1) Information base for property taxation; (2) support in financial allocation programmes; (3) monitoring and support of land market; (4) aid to land use development control; (5) provision of land information." In future, a land information system in Laos would be oriented on land use development and control. Because information is the basic resource in all (further) decision making (ib., p. 8), parcel based information is required.
The two other components of land management, *land administration arrangement* and *resource management*, are determined directly and indirectly by the administrative bodies, development policy and market place considerations as well as the respective land tenure arrangements (ib., p. 7).

Land allocation is regarded as a process by which formal tenure arrangements are created. With the land allocation, incentives for action of resource users should be strengthened (cf. FEDER and FEENY, 1991, cit. in WACHTER, 1992) and thus sustainable and productive management of natural resources to be encouraged. Within the process of land allocation, land information data should be gathered. Thereby prerequisites for the establishment of a land information management system will be created serving more effective decision making.

### 2.1.2. Application to villages under study

Land allocation in Laos is still in its initial stage. Consequently, the Case Study Approach was identified being appropriate for the intended research. "A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which different sources of evidence are used." (YIN, 1989) According to SCHRAMM, "... the essence of a case study, the central tendency among all types of case studies is, that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result". (SCHRAMM, 1971, cit. in YIN, 1989)

In order to obtain comparable results, the multiple case design was chosen and the minimum of two villages were selected. The results obtained in both villages were compared with the "norm" set by the legal framework.
2.2. Methodology

2.2.1. Identification of the villages to be studied

Representatives of the Dong Dok Forestry Department of the National University of Laos and the GTZ-project "PROFEP" identified the Vientiane municipality as the general study area. Reasons for the choice were the good accessibility of the region as well as the location of the Training and Model Forest in this administrative unit. Contacts had been made to the Ministry of Agriculture and Forestry and its Department of Forestry.

Taking into account the timeframe as well as the means and workforce available for research, the Sang Thong district within the Vientiane municipality was chosen as the focal area and two villages within the district were determined. The identification of the villages Napo and Khokpheun took into consideration the interests of the local partners as well as the previously implemented land allocation in the Sang Thong district. Main criteria for the identification were the location of TMF near Napo and the governmental initiatives for development of agricultural production in Khokpheun. Additionally differences in locality, population and basic infrastructure of both villages were considered as an argument for the selection of Napo and Khokpheun (cf. Appendix 06 and 07, see also illustrations in Appendix 11).

2.2.2. Data collection

The data collection following the empirical social research includes secondary as well as primary data. Secondary data refers to available and accessible printed matter. The collection of secondary data focused on official documents, such as laws and regulations, and the available land allocation documentation. In addition, documents of projects running in the region and/or the subject of land allocation were reviewed.

The primary data collection was carried out using the following methods: individual interviews, observation and group discussions. In order to receive comprehensive
information and to verify the obtained data, governmental officials, village administration and households were included in the assessment. Due to the different groups of respondent and various applied methods, all collected results were comparatively analysed by cross checking.

**Sampling**

Interview and observation are important methods to collect primary data in social science (Dieckmann, 1998). Due to available sources of evidence interviewing of households was identified as a fundamental source of information. Therefore respondent households were selected by sampling.

Due to differences in the structure of the village population, various characteristics were chosen to cover all groups of the village community. Wealth of households, their ethnic affiliation as well as the duration of settlement in the village were regarded as relevant. The principal idea selecting these features was, that affluence and ethnic affiliation of households and the period of settlement are correlated with the subject of the research and especially with size of land holdings, use rights, land use and land distribution among villagers.

As a first step, the households of both villages were grouped according to their wealth. This was done by the heads of the villages and two assistants (members of the village authority). The categories "very poor", "poor", "medium rich" and "rich" household were formed in both villages. The wealth grouping was executed separately for each village, using the standards and values of the respective villagers. The criteria used for the grouping of individual households are identical in both villages and summarised in Table 01.
Table 01: Wealth groups of the households and their indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Wealth group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>very poor</td>
</tr>
<tr>
<td>Rice sufficiency</td>
<td>no</td>
</tr>
<tr>
<td>Land claim</td>
<td>no</td>
</tr>
<tr>
<td>Wetland rice cultivation</td>
<td>no</td>
</tr>
<tr>
<td>Money or bank account</td>
<td>no</td>
</tr>
<tr>
<td>Status of the house</td>
<td>simple/bamboo</td>
</tr>
<tr>
<td>Electricity**</td>
<td>no</td>
</tr>
<tr>
<td>Special tools (e.g. iron buffalo)</td>
<td>no</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999)

*The wealth group "rich" was mentioned by the team but stated as not relevant in the selected villages and therefore not characterised by indicators.

**Only the village of Khokpheun has access to the public electricity supply. Electricity also includes the use of accumulators.

***If this point is "yes", the other points can be optional.

In addition, members of the Lao Loum and Lao Theung ethnic groups live in Napo while only Lao Loum live in Khokpheun. Due to the assumption that households with different ethnic affiliation have different access to resources, this characteristic was also assumed as being relevant for the selection of the respondents.

The duration of settlement was identified on the basis of data concerning the woman of the house. In most cases, the land is owned by the women and inherited by the daughters. After marriage the husband usually lives with the family of his wife. Only some years later, the new family will settle in his wife's village (GASTON, 1995). As no exact figures in relation to the duration of settlement and the origin of the inhabitants of both villages were available, the percentage of households which settled since 01/1990 in the village accounted for 15% of its total population according to the estimate obtained from the two mayors. A deadline not falling within the period of land allocation in both of the villages was chosen. The date 01/1990 was determined based on 2 considerations: (1) new legal regulations (e.g. Property Law) related to the land allocation were enforced in
1990 and (2) a large number of households could not determine the exact date of settlement in the respective village, so that guidance was needed.

Based on the results of the survey, the villages are composed as follows (Table 02):

Table 02: Characteristics of the village population

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Village Napo</th>
<th>Village Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>55</td>
<td>172</td>
</tr>
<tr>
<td>Number of persons</td>
<td>346</td>
<td>806</td>
</tr>
<tr>
<td>Wealth group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor [%]</td>
<td>36.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Poor [%]</td>
<td>12.7</td>
<td>40.7</td>
</tr>
<tr>
<td>Medium rich [%]</td>
<td>50.9</td>
<td>54.7</td>
</tr>
<tr>
<td>Ethnic affiliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lao Loum [%]</td>
<td>78.2</td>
<td>100</td>
</tr>
<tr>
<td>Lao Theung [%]</td>
<td>21.8</td>
<td>0</td>
</tr>
<tr>
<td>Duration of settlement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settled until 12/1989 [%]</td>
<td>Around 85 *</td>
<td>Around 85 *</td>
</tr>
<tr>
<td>Settled since 01/1990 [%]</td>
<td>Around 15 *</td>
<td>Around 15 *</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999, village documentation and * estimation)

As all identified attributes have to be taken into consideration to get a realistic picture of the village population, quota sampling as one type of the non-probabilistic sampling methods was used to select the respondent households (cf. BORTZ, DÖRING, 1995). The aim was to design the quota proportional to the real structure of the village population.
Corresponding to the available information, the households were identified on sketch maps, in which all households of the villages were indicated. The sample taken is as follows (Table 03):

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Village Napo</th>
<th>Village Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total population of the village</td>
<td>Sample</td>
</tr>
<tr>
<td>Number of households</td>
<td>55</td>
<td>24</td>
</tr>
<tr>
<td>Number of persons</td>
<td>346</td>
<td>152</td>
</tr>
<tr>
<td>Wealth group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very poor [%]</td>
<td>36.4</td>
<td>20.8</td>
</tr>
<tr>
<td>Poor [%]</td>
<td>12.7</td>
<td>25</td>
</tr>
<tr>
<td>Medium rich [%]</td>
<td>50.9</td>
<td>54.2</td>
</tr>
<tr>
<td>Ethnic affiliation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lao Loum [%]</td>
<td>78.2</td>
<td>75</td>
</tr>
<tr>
<td>Lao Theung [%]</td>
<td>21.8</td>
<td>25</td>
</tr>
<tr>
<td>Duration of settlement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settled until 12/1989 [%]</td>
<td>Around 85 *</td>
<td>83.3</td>
</tr>
<tr>
<td>Settled since 01/1990 [%]</td>
<td>Around 15 *</td>
<td>16.7</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999, village documentation and *estimation)

**Interviews**

Interviewing, the "Königsweg" (royal road) in social science (KÖNIG, 1972, cit. in DIECKMANN, 1998, p. 371), is the most frequently used tool in empirical social research. Face-to-face interviews were held with each selected household, mainly with the representative of the household. The semi-structured interviews were held during the time most convenient to the respondents mainly in the evening. The duration of an interview was about one hour on the average. Data gained in the
field were recorded as hand-written notes. The interviews were assisted by a native speaker acting as interpreter.

In addition, interviews were held with staff of institutions, governmental officials and village administration involved in the planning and implementation of land allocation in general as well as in the selected villages.

Observation

Observation as a tool in empirical research permits the analysis of the change in variables without manipulation of the researcher within the social context (DIEKMANN, 1998). This method was used to obtain additional information as well as to gain an insight into the village and its activities. The type of observation used can be described as open and participatory (BORTZ, DÖRING, 1995). By living with a local family the researcher came into close contact with the villagers. Observation enabled the collection of data on social interactions (BURGESS, 1995). Learning the local language facilitated access to the local people and raised the readiness of the villagers to integrate an outsider into their activities. The information gained was primarily used to guide the interviews and discussions through adaptation of the applied techniques to the special situation. In addition, observation was a tool to verify data obtained from other sources.

2.2.3. Data processing and analysis of the results

The processing and the analysis of the gathered data took place in 3 stages:

- Data transfer in computerised files and data processing;
- Display of information in graphic and tabular form;
- Analysis of information and comparative analysis of the results.

As most of the data in a single set were too small in number to give genuine results, statistical methods were not adequate for the analysis of the data. The data were treated as sets. Thereby the data obtained on land holdings and land use were separately analysed and presented in the context of land allocation. All results of the examination of the process of land allocation, changes in farm size, ownership status and land use were comparatively examined and compared with
the legal standard, too. On this basis, conclusions were drawn regarding the implementation of the process of land allocation and their implications for land holdings and land use of households. Consequently recommendations for further continuation of land allocation and the establishment and management of a Land Information System in Laos were given.
3. Legal regulations on land tenure and land use

3.1. Historical development of land tenure in the today's Lao PDR

The current utilisation of natural resources at village level is influenced by the traditional practices which have been developed through ethnic peculiarities and spiritual beliefs, the cultural standards, internal rules and intrinsic values of the community as well as by governmental intervention. Because of the low population density, there was little competition for land. Since a limited group of users (the village community) enjoyed the joint usufruct right, it appeared to be a common pool resource (cf. MCKEAN, OSTROM, 1995). Within the framework of such a common pool resource, individual use was recognised by the community.

On the basis of informal, internal agreements and recognition households and/or families claimed and cultivated individual plots of land. Size and location of the claimed land parcels by individuals were principally interrelated with the social status of the family in the village which, inter alia, is linked to the time of settlement. Land not claimed by individuals remained a collective resource. In the case of new settlers the village authority, in agreement with the villagers, retained the option to assign this common unclaimed land to them for individual use.

The forest area acknowledged by the village community as belonging to the village was used by all members of the community in accordance with their individual requirements. The user group assigned defined types of use to each part of the village forests. Certain areas were excluded from use as they are e.g. sacred forests.

In spite of maintaining the traditional land tenure arrangements, during colonial age the establishment of a land register was intended. "The French colonial system and the subsequent kingdom in Laos until 1975 guaranteed private property for individuals and juridical entities for registered land." (KIRK, 1996; page 3). However, the registration of land was predominantly restricted to urban areas.

---

1 The tenure terminology is used according to the explanations and definitions of BRUCE (1998) (cf. Appendix 10). Terms used in the cited laws and regulations were not changed.
Legal regulations on land tenure and land use

(the towns of Vientiane, Louang Prabang and Savannakhet) and, consequently, to a very small proportion of the total land area. Mainly settlement areas and agricultural land belonging to the Laotian upper class and the French colonial power located near the cities had officially been registered.

With the proclamation of the Lao Peoples Democratic Republic in 1975 the legal basis for land tenure under the previous French system was eliminated. All land was defined as state property and many of the former private land holdings were expropriated and put under state administration (GASTON, 1995). In 1975 the process of collectivisation of agricultural land was started which led to the establishment of more than 2,000 agricultural co-operatives. However, due to the collapse of rice production after only a very few years, the collectivisation process was suspended in 1979. In 1984 about 23% of agricultural land in Laos was under collective management. Despite that, the agricultural sector was still dominated by small individual farms. However, the legal status of the land used by individuals and co-operatives remained unclear (KIRK, 1996).

The pre-1975 legal basis was replaced by new laws and regulations, but only little attention was paid to questions of resource tenure and exclusive use of resources. Despite land was defined as state property, the traditional tenure systems continued to be accepted in most of the rural village communities. A formal, legal recognition and definition of these rights of disposal and of use was not drawn up.

Changes in the village's internal system of land use came about in relation to the use of forest land. It was still possible for the village community to extract timber and non-timber forest products from the forest for individual consumption. Commercial exploitation of forest areas was regulated by the State Forestry Department and executed by State Forest Enterprises.

The village authority (amnat ganpokrong baan) consisting of the mayor, his representatives as well as representatives of the social and political organisations, forms the highest local decision-making body (cf. Appendix 08). The mayor, who is elected every 2 years by the villagers of at least 18 years of age, heads the village authority. The village authority is charged with, inter alia, making decisions related to rights and responsibilities for the common use of local resources. The village
Legal regulations on land tenure and land use

authority is advised by the council of elders (naew home). The latter is consulted to settle disputes about the use of resources.

The government of the Lao PDR had introduced the New Economic Mechanism (NEM) in 1986. The aim of this macro-economic re-orientation is the transition from a centrally planned economy to a market oriented economy (Pham, 1994). The changes included the reform of legal skeleton conditions. Particular attention was paid to the regulations governing land. The new regulations are supposed to clearly define and determine tenure status and type of use of natural resources.

In accordance with the Constitution, the latest Property law and Land law the state still remains the owner of all natural resources, including land. This, however, is a qualified ownership (qualifiziertes Obereigentum) which concentrates on tax claims, safeguarding of common interests and regulation of land administration (cf. Kuhnén, 1982). Property rights and rights of use of resources can be allotted to individuals, households, juridical entities, organisations and village communities which include the assignment of land certificates. Customary usufructs are also respected by the new legal regulations.

If land certificates are connected to an agreement on land use, the state retains an influence, in particular on the type of agricultural use. By issuing of land certificates as well as deeds of ownership a land taxation is established. This is to ensure revenues for the state and serves as an instrument for the control and regulation of land use. The title holders have a legally recognised and protected basis for their property of land which allows them, inter alia, to sell the titles or to use the land as collateral security.

Forest land within the village area is intended to be allocated to the village community for common usage. This allocation includes the responsibility of the village community for management of the land. Management has to be performed in conformity with the rules laid down by the officials of DAFO and PAFO and requires their authorisation. A prerequisite for the management of village forest land is the approval of a binding management plan by the village community.
The new laws set forth binding skeleton conditions for land distribution and land use for the very first time. Traditional systems of tenure and use, particularly for agricultural land, are widely recognised and accepted. New prospects for agricultural development are also provided, e.g. through the creation of a legal land tenure and so for investment. With regard to forest resources, a reorientation of forest management and the delegation of responsibility for forest management to the village community are under development.

The most outstanding types of land tenure are listed in Table 04, along historical lines.

Table 04: Historical development of the tenure system of agricultural and forest land

<table>
<thead>
<tr>
<th>Time period</th>
<th>Status of land tenure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural land</td>
<td>Forest land</td>
</tr>
</tbody>
</table>
| Land tenure until 1975 | • Common pool resource with individual rights of use  
• Deed of ownership for registered land |
| Land tenure after the proclamation of the Lao PDR in 1975 | • in general state property  
• collective used land state property  
• individually used land and village land common pool resource with individual rights of use  
• deed of ownership for land registered before 1975  
• legal status as state property  
• forest land of the villages used as common pool resource, use limited by legal regulations |
| Land tenure by land registration and allocation since the beginning of the 1990's | • private deed of ownership  
• traditional rights of use  
• legal status as state property  
• village forest land common property  
• deed of ownership (in several cases, e.g. degraded forest used for tree planting) |

(Source: Review of publications and documents, survey 1999)
3.2. Current legal regulations of land tenure

The legal regulations of land tenure in Lao PDR are set forth in the following basic documents:

- Property Law (1990),
- Constitution of the Lao PDR (1991) and
- Decree on Land (1992) (The Decree on Land will be replaced by a new Land law, which was not available, so far.).

The Property Law, passed in 1990, promulgates that land, water, forests, water and land animals are defined as natural resources "...belonging to the national community, represented by the state" and "...the state may grant the right of control, use, transfer and inheritance to other organisations, economic units and individuals." (Art. 4)

In 1991, the People’s Supreme Assembly adopted the first Constitution of the Lao PDR. According to Chapter II Article 15 the tenure rights concerning land stipulated in the Property Law are confirmed and regulated as follows: “The state protects the right to ownership (rights to governing, rights to using, rights to transferring) and the rights to inherit property of organisations and individuals. As for the land which is under the ownership of the national community, the state ensures the right to using, transferring, and inheriting it in accordance with the law.” In addition to the general right of tenure, the customary rights of land use are embodied in the new Constitution (Chapter I, Art. 8): “All ethnic groups have the right to protect, preserve, and promote the fine customs and cultures of their own tribes and of the nation.”

The Decree on Land, issued in 1992, in general correspondence with the Constitution and the Property Law, states that "the land is the property of the national community, represented by the state of the Lao PDR, which manages the land on a centralised and unanimous level." (Chapter 1, Art. 1). Furthermore, it is stated that "the state organises the distribution of land to the Lao citizens for

---

1 The following brief summaries are based mainly on unofficial translations of the original texts into English, the only available sources in most cases. Occasionally, terms and phrases used in the translations permit various interpretations.
legally supported long term possession and use and considers the approval of lease or concessions for foreign residents and expatriates." (Art. 2) This article also reflects the reservation of state property as follows: "The state may withdraw the right of possession and use of land when the state requires its use for public purposes and if such possession or use of land is not conform with the regulations." In contrast to the policy pursued since 1975, various forms of land tenure are possible as a result of the legal regulations introduced in the 90's.
3.3. Regulations of land allocation

The Decree No.186 on the "Allocation of Land and Forest Land for Tree Plantation and Forest Protection" was enforced in 1994 to implement the stipulations of the Constitution and Land Law. Land allocation is the instrument to facilitate the occupation and development of permanent land use by providing identifiable parcels of agricultural land on which individual farming by households would be undertaken as well as to promote forms of forest resource management at local level. It materialises the rights fixed in the Constitution and the laws of the Lao PDR. The implementation of the Decree No. 186 is regulated by the Instruction No. 0822/AF on "Land-Forest Allocation for Management and Use" as of 1996. The objectives of land allocation are defined by the Instruction as follows:

- "To manage and use natural resources in general and the land, forest and watershed resources in effective and sustainable way as well as to ensure the protection of the environment and the richness in perpetuity;
- To reduce and progress towards total termination of shifting cultivation by developing permanent agricultural and forestry systems and occupations, in view to gradually uplift the livelihood of the pluro-ethnic population, particularly the shifting cultivators families and poor families to satisfactory level;
- To promote higher production of food and foodstuff;
- To promote the investment in commodity production, thus generating additional income for households" (MAF, 1996, page 2).

Among the objectives of land allocation, the termination of shifting cultivation in particular would have very far-reaching effects. Shifting cultivation forms the basis of livelihood of a large part of the Laotian population. It is a widely practised form of land use, in the mountainous regions of Laos but also in lowlands. Especially in mountainous regions, the development of permanent land use on fields used for shifting cultivation is often impossible.
The general principles of the land allocation procedure as fixed in the Instruction No. 0822/AF may be summarised as follows:

- The land allocation should be linked to land use planning at village level.
- The land and forest land allocation should be focused on land without permanent use. Thereby, special attention should be given to households without land for production as well as for tree planting. To households with acknowledged permanent land use, the land title should be conferred immediately.
- The land and forest land allocation should be conducted with the participation of the local population by using simple methods to ensure the understanding of locals as well as to maximise their acceptance of the whole process.
- In the case that the allocated land is still unused, irrespective of the capacity of the household, the owner should be encouraged to use the respective field. If the non-use of the land persists the owner should be warned. In serious cases this will lead to expropriation by the state. Then, the expropriated area will be subject to further redistribution to households of the village community.

The Instruction distinguishes 5 different types of land which, within the framework of land allocation, are to be treated differently:

1. "Land type bearing permanent production: paddy field, construction land, garden land (with banana, sugar cane, fruit trees and others.) This type of land is not to be allocated. The land management office of the district is to make actual measurement so as to issue land registration and land title for the population to manage and use according to the law.

2. Land type bearing no permanent production: shifting cultivation area, fallow land, deforested land and other. This type of land shall be subjected to allocation by redistribution so as to ensure that each family has land for production in accordance with the labour fund of each family. The advice is given regarding the type of crops suited to the land as well as the way to prepare and conserve the land.
Legal regulations on land tenure and land use

3. With land type left over from the allocation of the agricultural production any families can be allocated to if they are interested in tree planting or allocated to collective divisions for commercial tree planting or it may be allocated to private investors for commercial tree planting. This land type must be used exclusively for tree planting. Tree planting is not permitted on agricultural land.

4. The type of land set aside as reserve land of the village in anticipation of the increase in population of the village and the expansion of production area in the future. It is estimated at 5-10% of total village land area. The consultation with the population must be held so as to achieve effective use without leaving the land stay idle.

5. The forest types are of three categories: water source protecting forest, village forest reserve (sacred forest, cemetery, devine forest) and utility forest. In case where the village has no forest, land should be set aside for tree planting, primarily bamboo, fast growing trees for fuel wood and construction tree species for future use of the village community. In some cases where neighbouring villages have rich forest, an agreement on sharing the use and protection of the forest may be concluded. (MAF, 1996, p. 5f.)

The Instruction clearly distinguishes different land use types in proceeding land allocation. In the case of agricultural land, a differentiation is made between the procedures to be used on permanently used land and land which is not permanently used. Permanently used land is not to be included in the redistribution and allocation. This land should be surveyed, registered and the land certificate is to be issued. Land which is not permanently used can be subject to redistribution. The agricultural land which had been previously available to the family and the labour capacity of the family are to be taken into account in the determination of the size of the land which can be subjected to redistribution. The total size of all agricultural land belonging to one family should not exceed the maximum size of land area of 1 ha per family member as stipulated in the Land Law. The size fixed in the Land Law is a guide number which is to be adapted to the entire area of the village and the special village situation. The non-permanently used land of a household, which, together with the permanently used land does not exceed the legally stipulated size of land, is to be registered within the process of land allocation. If the total of agricultural land of a household is beyond the
permitted land size - according to the number of household members - the non-permanently used land which exceeds this stipulated size may be allocated to other families through redistribution.

In the cited paragraph 3 of the Instruction No. 0822/AF it reads "...Tree planting is not permitted on agricultural land." This could be understood as an initiative to prohibit Agroforestry practices on agricultural land as well as to restrict the elaboration of adapted and sustainable forms of land use. Other available legal regulations do not confirm this statement and/or give any additional explanation.

The allocation of forest land is principally addressing villages. According to the Instruction No. 0822/AF, the allocation of protected forests, buffer zones surrounding protected land areas, afforestation areas as well as other land with a clearly defined use is intended for village communities. However, degraded forests are treated as an exception. These may be allocated to families, households, juridical entities and organisations for the purpose of afforestation. The total size of deforested land or deteriorated forest land allocated to one family may not exceed a maximum area of 2 ha (Draft Law on Land, GOL, 1996) or 3 ha (Forestry Law, GOL, 1996d) per family member.

The different land categories and proposed procedure within the framework of the land allocation scheme are summarised in Table 05:
Table 05: Land types and their treatment within the land allocation process as identified in the Instruction No. 0822/AF

<table>
<thead>
<tr>
<th>Land type</th>
<th>Proposed procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Land type bearing permanent production: permanent used rice fields, construction land, garden land.” (incl. orchards)</td>
<td>Measurement, registration and issue of land title to the using households, not to be allocated</td>
</tr>
<tr>
<td>“Land type bearing no permanent production: shifting cultivation area, fallow land, deforested land and other.”</td>
<td>Subject of allocation to ensure that each household has land for production according to their labour fund</td>
</tr>
<tr>
<td>“Land left over from the allocation of agricultural land.”</td>
<td>Allocation possible to interested households, collectives or investors, exclusively to use for tree planting</td>
</tr>
<tr>
<td>Reserved land of the village for future expansion of production area for increasing population (around 5-10% of the total village area).</td>
<td>“… consultation with the population … to achieve effective use without leaving the land stay idle.”; not explicitly defined as subject of allocation</td>
</tr>
<tr>
<td>Forest land (in three categories: water source protecting forest, village forest reserve, utility forest).</td>
<td>Allocation to the village; in case of no village forest, land should be set aside for tree planting or use of forests of neighbouring villages may be shared (based on agreement)</td>
</tr>
</tbody>
</table>

(Source: MAF, 1996)

The Instruction ensures that the allocation of land may refer to families as well as juridical entities, collectives, divisions and villages. According to the Instruction families of Laotian nationality may claim the allocation of agricultural areas and degraded forest land for agricultural production, forest rehabilitation and re-afforestation. The size of the allocated areas varies according to local availability of land and depending on the labour and capital resources of the families. In the case of the re-allocation of areas, families, who are already living in the relevant village and did not previously have any land available for agricultural use, should be given priority.
The land allocation should be implemented according to the stages as identified in the "Instruction on Land - Forest Allocation for Management and Use" (MAF, 1996). The consecutive stages are listed in Table 06.

Table 06: The stages of the process of land allocation

<table>
<thead>
<tr>
<th>Stages of the implementation</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preparation</td>
<td>Qualified staff ready prepared for the field work</td>
</tr>
<tr>
<td>• Training of staff</td>
<td>• Preparing of plan of operation</td>
</tr>
<tr>
<td>• Preparation of plan of operation</td>
<td>• Field work which is adapted to the local situation</td>
</tr>
<tr>
<td>2. Consultation with the village</td>
<td>Information of village organisations and authority</td>
</tr>
<tr>
<td>• Discussion with village organisations and authority</td>
<td>• Information of village organisations and authority</td>
</tr>
<tr>
<td>3. Actual data collection</td>
<td>fixed village boundaries on agreement with neighbouring villages</td>
</tr>
<tr>
<td>• Village boundary survey</td>
<td>• Fixed village boundaries on agreement with surrounding villages</td>
</tr>
<tr>
<td>• Collection of general information</td>
<td>• General information about households and land use are collected</td>
</tr>
<tr>
<td>• Discussion with the households of the village about agricultural production</td>
<td>• Discussion with the households of the village about agricultural production</td>
</tr>
<tr>
<td>4. Open discussion with the whole village</td>
<td>Informing the households regarding the land allocation and its practical implementation</td>
</tr>
<tr>
<td>• Village meeting for all households held by the LAC, district and village authority</td>
<td>• Village meeting for all households held by the LAC, district and village authority</td>
</tr>
<tr>
<td>5. Actual field measurement</td>
<td>Agricultural land of the households is surveyed and measured and mapped</td>
</tr>
<tr>
<td>• Recording of the areas and their boundaries for each household</td>
<td>• Recording of the areas and their boundaries for each household</td>
</tr>
<tr>
<td>• Drawing up of sketches</td>
<td>• Drawing up of sketches</td>
</tr>
<tr>
<td>6. Conclusion/results</td>
<td>Registration/allocation of the area</td>
</tr>
<tr>
<td>• Summary of data</td>
<td>• Land ownership certificates and agreements on land use are issued</td>
</tr>
<tr>
<td>• Drawing up and issuing of land ownership certificates and agreements on land use</td>
<td>• Drawing up and issuing of land ownership certificates and agreements on land use</td>
</tr>
<tr>
<td>7. Extension</td>
<td>Support for improvement of the farming system</td>
</tr>
<tr>
<td>• Advisory service for the households</td>
<td>• Advisory service for the households</td>
</tr>
<tr>
<td>8. Monitoring and evaluation</td>
<td>Monitoring and evaluation of land allocation as an experience in continuation of this process</td>
</tr>
<tr>
<td>• Monitoring and evaluation of the process as well as of land use</td>
<td>• Monitoring and evaluation of the process as well as of land use</td>
</tr>
</tbody>
</table>

(Source: MAF, 1996)

The Instruction explicitly stipulates the involvement of the local population in the process of land allocation. Land allocation is to be carried out as a participatory process in conjunction with the representatives of each village, including the villagers. The registration of a household's land should be based on the data
available in the village and/or on the basis of information supplied by the households. This requires participation of the village population, which in turn necessitates their being adequately informed in advance.

The fixing and marking of the village boundaries, which should be undertaken in co-operation with the neighbouring villages, is included in the land allocation process.

As the result of the land registration and land allocation, temporary land certificates will be issued. In general, they are valid for 3 years and connected to a specific land use agreement. After three years' use according to the agreement the household may apply for a permanent deed of ownership. In the case of newly allocated land the annual use of at least one part of the land must be proven after issuing of the temporary certificate of land for a period of 3 years.

The draft of the Land Law as well as the Instruction No. 0822 do not finally stipulate whether the obligations to use will be extended and thereby practically causes a limitation of the fallow period for land to be newly allocated in relation to its size. This question was neither addressed in the existing legal framework nor in the ongoing practical implementation in Laos. The period since the beginning of land allocation has been too short and no permanent deeds of ownership have been issued for allocated land, yet.

Referring to the various regulations, an average sized household of 6 persons may hold a certificate of land/deed of ownership for about 6 ha of agricultural land (1ha per member) and about 12 ha (2 ha per member, GOL, 1996) or 18 ha (3 ha per member, GOL, 1996d) of deforested land or deteriorated forest land for tree planting. The differences in the size of deforested or deteriorated forest land are based on discrepancies between relevant documents. Generally, the indicated size is a guide number and is subject to be adapted to the available land within the village territory.
3.4. Legislation on the use of forests

The tenure arrangements for forests and forest land are set forth in the Forestry Law, which was passed in 1996. The relevant paragraphs are summarised as follows: Individuals and juridical entities who have lawful possession of forest and forest land have the right to use and protect their forest resources, to receive benefits, and to assign, transfer, or devise their right of possession to other individuals or juridical entities. The assignment of the right of possession is the assignment of forest and forest land by a competent governmental agency to an individual or juridical entity for long-term possession and use in accordance with specific regulations. In any event, the right of possession will expire when the possessor of forest and forest land forfeits it, illegitimately transfers, or withdraws from such right of possession (GoL, 1996d).

"The tenure rights to forest and forest land are obtained by transfer, allocation and inheritance" (Art. 48). The allocation of forest land is explicitly addressed in Article 13 focussing on degraded forests and re-afforestation areas: "The state grants rights to use degraded forest and barren land to individuals and organisations, for the purpose of planting trees or regenerating forest, depending on their capacity in terms of labour and capital. An individual family will be allocated an area of no more than three hectares for each unit of labour in the family. In case a family or other organisation wants a larger area they have the right to request the lease of additional land from the state, and arrangements made will depend on production capacity." (Art. 13)

On the one hand, the Law provides the framework for performance, and on the other hand it gives space for a relatively wide range of action. In particular the used terms "capacity" as well as "unit of labour" are not clearly defined. This causes difficulties in calculating size of areas for allocation and distribution.

The law also defines and regulates the customary use of forest and forest land as follows: "Customary use of forest and forest land is the use of forest, forest land and forest produce which has been practised for a long period and is recognised by society and/or law. Customary use includes the collection of non-prohibited wood for fences and fuel, the collection of forest produce, hunting and fishing of
non-prohibited species for household consumption and other uses following custom ...." (Art. 30) Same Article stipulates that the customary use should be in accordance with the village regulations on forest and forest land determined by the village authority.

Concerning the communal and individual use of wood it is stipulated: "Tree felling for construction, repair and other household uses is only allowed in the production forest of the village. Only species which are not protected can be used and not more than 5 cubic meters of log (round timber) per family. Tree felling is allowed only in specified areas and in accordance with regulations proclaimed by the village authority." (Art. 28) The term "specified area" isn't defined in the Law. Mention of the fact (1) by whom the area should be defined as well as (2) which criteria should be used for the determination of such an area is missing. In addition, the Law doesn't specify the time frame in which the defined 5 m³ of timber can be extracted by an individual household.

The legal framework conditions provide for the first time legal possibilities for the management of forest land on an individual and communal basis. However, the competence of different user groups is not always clearly determined, a matter which, particularly at village level, may result in competing interests.
3.5. Village forestry strategy

There is a long tradition of the customary use of forest resources in Laos. Extraction of products from forests was previously practised without formal legal regulation. Since the end of the 1980's, the government of the Lao PDR has created a legal foundation which endows the local population with rights of management of these resources and which legally defines and regulates these customary rights.

Based on the respective laws and regulations, the shift toward more people-oriented forest management is emphasised. In this process, the family was recognised as the key economic unit and the development of model farms and model villages aimed at (MAF, 1997).

In accordance with the intended involvement of the local population in the management of forest resources, the development of a suitable strategy has been initiated. This strategy is supposed to serve as an important tool for sustainable forest management. The development of a Village Forestry Strategy is still at pilot project implementation stage. It is intended to conclude from the experiences gained from pilot projects and to develop a feasible concept for a Village Forestry Program. The strategy under development should be flexible, in order to enable adaptation to different locations, forest types and the socio-economic situation of the respective villages.

In the context of "Village forestry", forest land remains the property of the state, but the state allocates land for management to various organised groups and also to individuals (MAF, 1997). The state allows the villages "...to manage the forests on behalf of the state, but with assistance from the government agencies." (FOMACOP, 1996a, p. 4) In this context, the Draft Village Forestry Strategy distinguishes between forest ownership and managership.

The Draft National Village Forestry Strategy defines "Village Forestry" within the Laotian context as: "...the partnership between the state and organised villagers for the management of designated forests in order to sustain the flow of benefits,
Legal regulations on land tenure and land use

which are fairly shared by the villagers and the rest of the national community." (MAF, 1997, p. 9)

The terms are used in the following meaning:

- "partnership" means that each partner has decisions to make and execute,
- "organised villagers": villagers have to organise themselves for the partnership,
- "designated forests": forests allocated to the village with their boundaries delineated, mapped and approved by state authorities,
- "sustain" refers to the general objectives of sustainable forest management,
- “fairly” refers to the distribution of benefits according to the inherent rights, investment and effort made by various parties into forest management and protection (MAF, 1997).

According to the Draft Strategy, the management of the defined forests under village responsibility includes the following activities:

- "practice of customary rights to the use of the forest;
- entry to the forest to do management operations, e.g. forest protection, enrichment planting, timber stand improvement etc. in accordance with an approved forest management plan;
- apprehension of unauthorised entry to the forest by persons to collect forest products;
- management and utilisation of non-timber forest products, and their regulation in accordance with the approved forest management plan;
- management and utilisation of timber products in accordance with the approved forest management plan and under the supervision by DAFO of the actual forest operations, e.g. tree marking, harvesting, scaling, etc.;
- transport of pre-scaled and documented timber for sale;
- distribution of timber sales revenues and payment of royalties." (MAF, 1997, p. 9f.)
Different concepts are currently tested in the following projects and programs in pilot areas and villages. These are as follows:

- **Village forestry development activities as part of GoL's land and forest land allocation program;**
  - until now focused on allocation of land for management by villagers;
  - a management model for systematic implementation of Village Forestry not yet developed;
  - promotion of tree growing by farmers by providing land tax exemptions;

- **Joint forest management program activities of the Lao-SIDA Forestry Program**
  - improvement of the ecological and management knowledge for sustainably managing natural forests;
  - covering a state production forest area;
  - sharing of management responsibilities;

- **Village Forestry in FOMACOP**
  - development and testing of village forestry in Lao PDR;
  - participatory demarcation of village boundaries, forest inventory and forest management planning;

- **Community Forestry Project, DOF/CUSO/JVC**
  - part of the Shifting Cultivation Stabilisation Program of the DoF;

- **Nam Ngum Watershed Management and Conservation Project by GTZ**
  - main objectives are the management of the watersheds of the Nam Ngum in a participatory way and the increase of the income of rural population in the project area;
  - includes participatory approach to planning and executing of sustainable agriculture and forestry (MAF, 1997)

Due to rather limited knowledge and experience in forest management of villagers as well as forestry administration, the management of forests at village level is but initially developed yet. Based on the experiences from various projects, an adapted and flexible Village Forestry strategy could be developed. In this connection, land allocation becomes instrumental.
4. Land allocation - Process, results and discussion

4.1. The process of land allocation

4.1.1. The process of land allocation in Khokpheun

The District Land Allocation Committee (LAC) is the official executive body in the whole district and a component part of the District Agriculture and Forest Office for the period of implementation. Nine professional officers of the LAC were entrusted with the implementation of land allocation in Khokpheun by the district administration.

The activities of implementation in Khokpheun according to the steps formulated in the "Instruction on land - forest land allocation for management and use" (cf. Chapter 3.3.) can be described as follows:

In preparation of the implementation in Khokpheun village the participating official staff from the LAC received training in order to update their knowledge. The training was organised and executed by the Ministry of Agriculture and Forestry. The LAC planned the process of land allocation and formulated an operation plan.

In conversation with the village authorities (amnat ganpokrong baan), consisting of the mayor, his representatives and representatives of the village organisations (Lao Women Union, Council of Elders) the upcoming measures were laid down and announced, the process of implementation explained and the realisation arranged. Subsequently, a village meeting was announced by the mayor of the village, which was to serve as an opportunity for open group discussion between the staff of the LAC, village authorities and the households of the village about the intended land allocation. All the households were invited. However, there are no available data on the rate of attendance.

For the purpose of implementation, some villagers were included as guides and as assistants in the surveying procedure. According to the official report in Khokpheun, a total of 42 people (members of 33 households representing 19.2%
of all households and 9 professionals), subdivided into 5 working groups, were included in the implementation.

As a first step in implementation, the boundaries of Khokpheun village were fixed. Previously, the boundaries were informally acknowledged by the villagers, but occasionally they were a cause of disputes with neighbouring villages. The LAC jointly with the village authorities of Khokpheun and of the neighbouring villages identified the boundary of the village area in the field as well as on map. Uncertainties about the previously informal boundaries were ironed out in common discussions and the demarcation was drawn which was accepted by the parties involved. According to this agreement, the area of the village Khokpheun totals to 1454 ha (LAC, 1997).

Subsequently, different land use zones were determined on the basis of actual land use. The following zones were distinguished: conservation forest, sacred forest, plantation area, agricultural land and land under shifting cultivation. Besides this, the area of settlement, the school and pagoda area and the cemetery were ascertained. The different land use zones were marked on a sketch map, which is available at the Provincial Agriculture and Forestry Office (PAFO). A copy of the map is not on display in the village.

General household data as well as basic data on land and land use were gathered. Only areas which were reported by the households were included in the survey of the LAC. The households reported the size of their fields as well as the type of use of the fields to the mayor. The size of the areas reported by the households referred to an estimate or measurement by the individual household. As these data differ significantly from the results of the survey by the LAC, information submitted by households served mainly to identify and locate the individually claimed land parcels. In addition, some data were taken from the records of the village authority. These data had been collected regularly by the mayor and his representatives.

The land of the households in the village was surveyed by the LAC on the basis of the previously collected data within a period of 6 working days and sketch maps were prepared. The survey included permanently used land (wetland fields,
Land allocation - Process, results and discussion

permanently used upland fields, individual grazing land, orchards and vegetable gardens) as well as non-permanently used fields (upland fields under shifting cultivation incl. fallow as well as reported actually unused areas). Following the available report (LAC, 1997), the total area of 824 ha on 395 parcels of agricultural land was ascertained in Khokpheun. This number includes 177 parcels of rice fields with a size of altogether 425.5 ha, 120 parcels of orchards with a measured total size of 126 ha as well as unused land with an area of 272.5 ha on 98 parcels. In the report of the LAC no distinction was made between permanently and non-permanently used rice fields.

The next step comprised discussions about agricultural production between the members of the LAC and interested households. These conversations were simultaneously used as an opportunity for the delivery of information concerned with the forthcoming formal land allocation.

The data obtained formed the basis of land registration. Parcelwise land registration is an essential component for the establishment of a Land Information System (LIS). Temporary certificates were conferred to households for every determined field by the respective household. In addition, each land certificate is linked to a particular land use agreement which identifies the type of use of the respective land parcel. Both of these documents facilitate the control of land use.

Land under permanent use had exclusively been registered, no allocation by redistribution happened according to the information provided by the LAC and village authority. This circumstance was confirmed by the respondents of the sample (see Chapter 4.2.).

The allocation of non-permanently used land parcels took place subsequent to the procedure of registration of permanently used land.

Immediately after having completed the registration and allocation of land, the Agricultural Unit of the province (PAFO) as well as the district agricultural authorities (DAFO) offered agricultural extension to individual farm households. Extension services have been run regularly since the land registration. They concentrate on the intensification of rice production as well as on the cultivation of
vegetables for local and regional commercialisation. Undoubtedly, this activity refers to the decision made by the provincial authorities to develop Khokpheun village as a model for intensive agriculture.

4.1.2. The process of land allocation in Napo

The District Land Allocation Committee (LAC) was also the executive body in Napo. Due to an official request, the LAC team was supported by 2 lecturers from the Dong Dok Forestry Department (DDFD) of the National University of Laos (NUOL). The number of involved professionals of the LAC as well as data of the period of time required for implementation of land allocation have neither been recorded at district administration nor at the DDFD.

Planning the land allocation process as well as the implementation in 1998 took into consideration that the village boundaries were fixed and marked already in the year 1996. That year the boundaries of the Training and Model Forest of the DDFD of the NUOL had been established. The boundaries of the areas of the neighbouring villages were simultaneously agreed upon. So, the boundary of the Napo village as demarcated served as an official basis for the subsequent allocation of land. According to the agreements, the village covers an area of 2301 ha.

After having identified land use zones by the LAC within the village territory, the land allocation process was conducted in 1998 by two working groups: one for agricultural land and one for forest land. An unreported number of villagers were employed as guides and assistants. After the completion of the land allocation in Napo, the different land use zones were visualised on a map which is on display in the village still (cf. Photo 01). The distinguished land use zones (Photo 01) do not correspond to the land use categories as defined in the legal regulations (cf. Chapter 3). A definition of the categories used in Napo was not available either.
Land allocation - Process, results and discussion

The LAC announced the general strategy of implementation in the village. The detailed working plan was formulated by the LAC together with the mayor, his representatives and the representatives of the village organisations. In addition, one village meeting regarding the land allocation was held. At the meeting it was announced, inter alia, that every household has to limit agricultural land holding to avoid extreme exceeding of the average size and/or the legal guide number (1 ha/person). Households which had a rich supply of land for agricultural production were, in the course of subsequent discussions with the village households, asked to provide land for allocation to landless households.

The LAC carried out the survey of land which was reported by the households, regardless of whether it was permanently used or not. A report on the formal land allocation is missing. So no official secondary data were available for this research. The information on land areas by land use type is solely resulting from the individual interviews with the selected households. As result of the registration of land of households, unclaimed land within the village area was allocated to
landless households as well as to households with insufficient or inappropriate land for production. The distribution of land was conducted on a voluntary basis involving beneficiaries as well as households formerly occupying the land. Finally, land certificates combined with land use agreements were conferred to the households for each registered or allocated parcel of land.

4.1.3. Comparative analysis of the process of land allocation in Khokpheun and Napo

Establishing formal land tenure is a very essential process with regard to land use, land management and land administration. In this context, the process of land allocation was insufficiently documented in both of the villages. Only for the implementation of the land allocation in Khokpheun an official report was available. However, this report could not provide comprehensive information. Even if exploiting all available sources, the process of land allocation in Napo and Khokpheun could only be fragmentarily fathomed out.

In Khokpheun, land allocation took place in 1997 and in Napo during 1998. Only in the case of the village Khokpheun, information on the time frame of the implementation was available. The implementation of land allocation in one village required 2 weeks of work. This information was confirmed by staff members of the LAC and can also be assumed as the timeframe of implementation in Napo.

In general, it can be assessed that land allocation was implemented according to the stages indicated in Instruction No. 0822/AF (cf. Chapter 3.3., Table 06). The reached level of land allocation in Khokpheun is compared with that of Napo in Table 07.
Table 07: Process of land allocation in Napo and Khokpheun by stages

<table>
<thead>
<tr>
<th>Stages of the land allocation process</th>
<th>Results of land allocation in Napo</th>
<th>Results of land allocation in Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Preparation</strong></td>
<td>• Training of staff and preparation of operation plan</td>
<td>• Staff is trained and the detailed operation plan elaborated</td>
</tr>
<tr>
<td></td>
<td>• Staff is trained and the detailed operation plan elaborated</td>
<td>• Staff is trained and the detailed operation plan elaborated</td>
</tr>
<tr>
<td>2. <strong>Consultation with the village</strong></td>
<td>• Discussion with village authority and organisations about land allocation</td>
<td>• Village authorities and organisations are informed</td>
</tr>
<tr>
<td></td>
<td>• Village authorities and organisations are informed</td>
<td>• Village authorities and organisations are informed</td>
</tr>
<tr>
<td>3. <strong>Actual data collection</strong></td>
<td>• Village boundary survey</td>
<td>• Village boundary is fixed and marked</td>
</tr>
<tr>
<td></td>
<td>• General village and household data are available</td>
<td>• General village and household data are available</td>
</tr>
<tr>
<td></td>
<td>• Problems regarding agricultural production are discussed with interested households</td>
<td>• Problems regarding agricultural production are discussed with interested households</td>
</tr>
<tr>
<td></td>
<td>• Discussion with households of the village about agricultural production</td>
<td>• Discussion with households of the village about agricultural production</td>
</tr>
<tr>
<td>4. <strong>Open discussion with the village community</strong></td>
<td>• Village meeting for all households held by the LAC, district and village authority</td>
<td>• Village meeting concerning the land allocation; no minutes of the meeting</td>
</tr>
<tr>
<td></td>
<td>• One village meeting held on March 27 1997; no minutes on the meeting</td>
<td>• One village meeting held on March 27 1997; no minutes on the meeting</td>
</tr>
<tr>
<td>5. <strong>Actual field measurement</strong></td>
<td>• Measurement of the areas and demarcation of parcel boundaries for each household</td>
<td>• Areas reported by the households are surveyed (on voluntary basis for the household)</td>
</tr>
<tr>
<td></td>
<td>• Drawing up of sketches</td>
<td>• Parcel sketches are drawn</td>
</tr>
<tr>
<td></td>
<td>• Areas reported by the households are surveyed (on voluntary basis for the household)</td>
<td>• Parcel sketches are drawn</td>
</tr>
<tr>
<td>6. <strong>Land registration and land allocation</strong></td>
<td>• Summary of data of land use per household</td>
<td>• Land deed as well as land use agreements are prepared</td>
</tr>
<tr>
<td></td>
<td>• Drawing up and issuing of land deed and agreements about land use</td>
<td>• Temporary land deed and land use agreements are issued to the households</td>
</tr>
<tr>
<td></td>
<td>• Land deed as well as land use agreements are prepared</td>
<td>• Temporary land deed and land use agreements are issued to the households</td>
</tr>
<tr>
<td>7. <strong>Extension</strong></td>
<td>• no extension in Napo yet</td>
<td>• agricultural extension started by PAFO and DAFO</td>
</tr>
<tr>
<td>8. <strong>Monitoring and evaluation</strong></td>
<td>• not yet established in Napo</td>
<td>• not yet established in Khokpheun</td>
</tr>
</tbody>
</table>

(Source: MAF, 1996; LAC, 1997; Field survey, 1999)
In both villages, parcel based land information data were gathered. Areas claimed by the households were listed. Parcels of land permanently used of the categories wetland area, permanently used upland fields, garden land, grazing land and settlement area, and the non-permanently used shifting cultivation and fallow area were included (cf. Chapter 3.3., Table 05). The land parcels of all categories were surveyed, sketches were drawn and temporary land certificates were conferred. No redistribution of non-permanently used land or allocation of land not yet used was reported.

According to the intended process (cf. Chapter 3.3.), which aims both at the understanding by the locals and at maximising of their acceptance of the whole process, the LAC offered the possibility of information to the same extent for the households of both villages. Knowledgeable households are assumed as an important precondition for acceptance of the aims of land allocation and active involvement in the process, including the application of the knowledge in the process. If the households use the knowledge within the process of land allocation the following conditions have to be taken into account:

- the knowledge dissemination to channel knowledge to the right person at the right time to achieve an understanding of the intended process of land allocation by the respective household;
- the household's interests in the implementation of land allocation due to the expected benefit for the household.

The information of households regarding their knowledge and application of knowledge within the process of land allocation is summarised in Figure 01.
Despite the offer of staff members of the LAC to deliver information on legal background, objective, procedure and period of time of land registration and allocation, not all of the households in the sample described themselves as sufficiently knowledgeable. Out of a total of 65 interviewed households in both villages, 19 households described themselves as not knowledgeable. These are 9 households in Napo (38% of the sample) and 10 households in Khokpheun (25% of the sample). The remaining households described themselves as sufficiently knowledgeable.

In the sample of both villages, only a few households (17% in Napo and 12.5% in Khokpheun) made use of their knowledge to participate in the process of land allocation. As data on land parcels, their locality and use are not available so far, the intended involvement of villagers by the LAC focuses on technical assistance as guides as well as on surveying. Besides the official participation within the process of land allocation, households intended to safeguard the land holding of the extended family prior to formal land allocation. Such unofficial action was also considered as use of knowledge within the process and included in Figure 01.

Households, which used their knowledge within the process of land allocation, belong to the medium-rich wealth group in the village. Those households are...
relatively powerful within the villages' social structure and the members are relatively well educated (cf. Appendix 02 and 03). Furthermore, households, which are claiming agricultural land with a high potential for use, recognise economic interests in safeguarding the land holding status by the registration of areas in the process of land allocation. Those households also used their knowledge for the individual re-distribution of land parcels prior to formal land registration.

In the case of households that declared to be not involved, it can be concluded only little interest in land allocation. In addition, the lacks of information and understanding as well as limitations in the feasibility of changes in existing household situations diminish the interest of households in the development initiatives provided.
4.2. Changes in tenure status and size of agricultural landholdings

Land allocation is supposed to intervene in land distribution as well as to provide land to landless households for the improvement of economic and social household conditions.

In the case of insufficiently available agricultural land for allotment within the village area, households with comparatively sufficient land or especially with an oversupply of land in relation to the laws are required to release land out of their customary claimed land holdings. In this context, by land allocation a balance should be attained between the objectives of the land allocation and a slightest possible intervention in the social structure and the land tenure system of the village.

Based on the data communicated by households in the sample, change of land tenure status resulting from land allocation is summarised in Table 08.

Table 08: Land tenure status of households in the sample in Napo and Khokpheun before and after the land allocation

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Napo</td>
</tr>
<tr>
<td></td>
<td>before LA</td>
</tr>
<tr>
<td>Sample (Number of households)</td>
<td>24</td>
</tr>
<tr>
<td>Number of landless households</td>
<td>4</td>
</tr>
<tr>
<td>Number of landless households using leased land</td>
<td>-</td>
</tr>
<tr>
<td>Number of households claiming land*</td>
<td>20</td>
</tr>
<tr>
<td>Number of households with temporary certificate</td>
<td>-</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999)

*It indicates land which is not yet registered/allocated.
**Households still claiming unregistered land after land allocation. But the number of households in the sample is unknown.
The most important result is the reduced number of landless households from 10 (25%) to 3 (7.5%) households in Khokpheun. Two of the remaining landless households use leased land. While prior to the land allocation, the number of landless households in Napo was lower than in Khokpheun, an equal number of landless households could be identified in both villages after land allocation. Because of the different size of the sample in the villages, the share of landless households in the sample is higher in Napo (12.5%) than in Khokpheun (7.5%).

After land allocation, the existence of traditionally claimed land, which is held by a large number of households and in some cases comprises an appreciable size, could be confirmed during the interviews and discussions conducted in the villages. The respective households evaded further information related on areas. All further analysis on land holding and land use are based on data provided by the households. Due to the correspondence of data on land holdings before and after land allocation of households, has to be concluded that still claimed and unreported land parcels were also not reported by the households as land holding prior to land allocation and/or the interviewed households do not hold claimed land after land allocation. Households still claiming usufructs did not request for registration of these areas. Three major reasons were mentioned for not to report these land parcels initially, namely:

- the fear to loose land exceeding the maximum size stipulated in the laws,
- the tax which would have to be paid on all registered/allocated land,
- the informally claimed areas should have been reserved for future use or for children.

The comparison of data on size of landholdings of households before and after land allocation reveals changes in farm size. The changes in the size of land holdings per household member are presented in Figure 02.
In Napo, the average of 1.09 ha per person declined slightly to about 0.9 ha per capita. This impact on agricultural landholding per household member in Napo is related to two households with an area between 3 and 4 ha per person before land allocation. After land allocation, the size of registered land of those households amounts to less than 3 ha per person. The land of both of these households (cf. Appendix 04, household 3 and 5) was either sold or given to relatives prior to registration. The households did so, accepting the regulations of the land allocation.

In Khokpheun, a more distinct change of the average size took place. Before land allocation started, the land area claimed per person amounted to 1.21 ha on average in Khokpheun, whereas after land registration the average size decreased to 0.93 ha per person. In Khokpheun, the increase in households with a land holding up to 1 ha/household member reflects the land assignment to formerly landless households. Only one household (cf. Appendix 05, household 32) reported a great decline in area per household member due to sale of land prior to land allocation. The size of the landholding of this household decreased from 4.5 ha to 2.5 ha agricultural land/household member.
However, the majority of the households in Napo as well as in Khokpheu stated before as well as after the land allocation an area smaller than 1 ha/person.

The size of the landholdings of households is connected to the fertility of soils. Therefore, the principal types of land use (wetland and upland fields) with respect to area size are discussed separately. Due to the differences in the size of households, the areas per person are presented. (Figure 03 and 04)

![Figure 03: The size of wetland areas (ha) per person in the sample in Napo and Khokpheun (Source: Field survey, 1999)](image)

The comparison of data visualised in Figure 03 proves that there are differences between the size and distribution of wetlands. In Napo, the maximum size of wetlands per household member accounts to 0.5 ha, whereas in Khokpheu some households hold wetland areas with a maximum size of nearly 2 ha/household member. The differences between both villages mainly refer to the availability of wetland areas in each of the villages. Whereas wetland fields are a scarce resource in Napo, they are "sufficiently" available in Khokpheu. The majority of the surveyed households claiming wetland areas in both villages own wetland areas with a maximum total size of 0.5 ha/person. Due to the strategy of households to safeguard the landholding at least of the extended family, the share of households holding wetland areas of as much as 0.5 ha/person has increased in both villages.

Besides wetland areas, the households hold upland fields in both villages. The distribution of size of those areas per person is presented in the following figure.

43
In Napo, only 4 households stated to claim no upland areas before land allocation. After land allocation still three of them notified identical condition. Nearly one half of the households in the sample own upland fields sized between > 0.5 and 1 ha/person. Analogous to the increase of households with an area of up to 1 ha/person, the area of a household equipped above average declined.

In Khokpheun, the majority of households hold upland areas at a maximum size of 0.5 ha per person after land allocation. The number of households without upland fields decreased in Khokpheun, but is still relatively high.

As a whole, Figure 03 and 04 represent the different availability of wetland and upland fields in Napo and Khokpheun. Correspondingly, changes in the size of landholdings by land allocation are focussed on wetlands in Khokpheun and on upland fields in Napo. Changes mainly refer to decrease in number of households without wetland and/or upland fields through redistribution/allocation of land as well as the increase of households with a low and/or an average size of land per person. Thereby the possibility for landless households to receive land was mainly given. Resulting from the strategy of households to safeguard the landholding of the extended family, a redistribution of land parcels in favour of individual households was given.
4.3. Implications of land allocation on farm land use of households

4.3.1. Changes in farm land use of households in the sample

The results in Table 09 illustrate the alterations of land use by households. It shows the compiled information about actually used land area and the types of land use prior to land allocation. Strategies of the households and tendencies in reaction on land allocation under the specific local conditions within the villages are revealed. Due to the different number of persons per household, the extent of every land use type is listed in terms of area per household as well as per person. In addition, the total size of farm landholding of households before and after land allocation is summarised. Vegetable gardens of some households in Napo with usually less than 0.07 ha do not be included in this assessment (see also illustrations in Appendix 11).
Table 09: Summarised information of agricultural area and land use in the sample in Napo and Khokpheun before and after land allocation

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Area in Napo</th>
<th>Area in Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households of the sample</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>Irrigated wetland area <em>(na)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigated land [ha]</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No. of HH. with irrigated land</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Irrigated land per household [ha]</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Irrigated land per person [ha]</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wetland rainfed area <em>(na)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>17.65</td>
<td>18.65</td>
</tr>
<tr>
<td>No. of HH. with wetland fields</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>∅ area per household [ha]</td>
<td>1.26</td>
<td>1.17</td>
</tr>
<tr>
<td>∅ area per person [ha]</td>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>Upland <em>(hai)</em> (permanent use)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent use [ha]</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No. of HH. with permanent used hai</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>∅ area per household [hai]</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>∅ area per person [hai]</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Upland <em>(hai)</em> (shifting cultivation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>95.90</td>
<td>81.90</td>
</tr>
<tr>
<td>No. of HH. with upland fields</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>∅ area per household [hai]</td>
<td>5.05</td>
<td>4.1</td>
</tr>
<tr>
<td>∅ area per person [hai]</td>
<td>0.74</td>
<td>0.59</td>
</tr>
<tr>
<td>Useful time [years]</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Fallow period [years]</td>
<td>5.21</td>
<td>4.05</td>
</tr>
<tr>
<td>Grazing land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>No. of HH. with grazing land</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>∅ area per household [ha]</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>∅ area per person [ha]</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Orchard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>4.90</td>
<td>3.90</td>
</tr>
<tr>
<td>No. of HH. with orchards</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>∅ area per household [ha]</td>
<td>0.61</td>
<td>0.56</td>
</tr>
<tr>
<td>∅ area per person [ha]</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Plantations <em>(Tectona grandis)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>No. of HH. with plantations</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Unused land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>18.79</td>
<td>16.25</td>
</tr>
<tr>
<td>No. of HH. with unused land</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>∅ area per household [ha]</td>
<td>2.09</td>
<td>1.80</td>
</tr>
<tr>
<td>∅ area per person [ha]</td>
<td>0.36</td>
<td>0.31</td>
</tr>
<tr>
<td>Σ of the land [ha]</td>
<td>144.24</td>
<td>128.70</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999) (All areas reported by the households are included in the assessment.)

Remark: "⇒" marks selected significant changes

* The land use terminology is used according to the explanations in Appendix 09.
Wetland area

The installation of nearly 10 ha of irrigated wetland area in Khokpheun in the year 1997 is a most essential change in land use. Irrigation enables a second harvest on irrigated land. This is an innovation in Khokpheun, from which one quarter of the interviewed households are benefiting. Such intensification was not apparent in Napo.

The total area of rainfed wetland has slightly increased in both of the villages between 1997 and 1999. Due to an analogous increase in the number of households using rainfed wetland area, the size of rainfed wetland area per household as well as per person decreased. The size of rainfed wetland area per person in Khokpheun remains nearly the threefold as compared to Napo.

Upland fields

The total area of upland fields per household - including permanently used area and shifting cultivation area - is almost similar in Napo and Khokpheun. While in Napo nearly all upland area before and after land allocation is used under shifting cultivation, the share of permanently used upland area in Khokpheun was around 56% of the total upland area before land allocation and had increased up to actually nearly 76%. The number of households using permanent upland areas substantially increased up to nearly the double in Khokpheun. This increase in permanently used area corresponds to a decrease of land area under shifting cultivation in the same period of time.

Despite similarities in shifting cultivation area per person, including the time for agricultural production, the calculated fallow period decreased in Napo to as many as 4 years, while in Khokpheun it increased up to more than 6 years.

Grazing land

Resulting from land allocation, grazing land is reported on by around 25% of the households in Napo and 15% of the households in Khokpheun. The total size of grazing land didn't change in Napo, while it nearly doubled in Khokpheun. Fallow land as well as rainfed fields are additionally used as pasture in the dry season.
The change into intensive, permanent use of wetland and upland areas in Khokpheun reduced the amount of fallow and temporary unused land for pasture and implied the need for new land for this purpose.

*Orchard*

In the case of orchards, differences between both villages exist. While in Khokpheun about one half of all surveyed households cultivate orchards, only around one third of the households in Napo reported on about groves of fruit-bearing garden. In Khokpheun, the area of orchards per head counts nearly the double than in Napo. Additionally, the total orchard area has increased in Khokpheun, while it has decreased in Napo.

*Tree plantation*

Due to the low number of households in both villages which ascertained a tree plantation, plantations remain a rare type of land use. While prior to land allocation no household did plant forest trees, 1 household in Napo and 2 households in Khokpheun mentioned this land use category which is used for growing of Tectona grandis after land allocation.

*Unused land*

In Napo, 37% of the households confirmed the possession of unused land, whereas actually unused land was mentioned only by 10% of the households in Khokpheun. The decline of the total unused land area was in Khokpheun larger than in Napo.

*Total size of farm land*

In Napo, the total size of agricultural area per household has decreased by nearly 10% to an average size of about 5.4 ha per household. In Khokpheun, the average of all household refers to about 4.2 ha both in 1997 and 1999.
4.3.2. Transfer of land area of households to other households prior to land allocation

Land management esp. resource management varies. As the interviewed households do not represent a homogenous group but are in exchange with other households of the village, the changes (Table 09) are caused by two aspects:

- the transfer of area (of different land use type) to other households not included in the sample, and
- "real" transformations of land use type on the same area (see Chapter 4.3.3.).

The transfer of area to other households can be realised by sale, purchase, bequeath, inheritance, donation to relatives or other persons as well as by allotment.

The apprehensions to loose formerly claimed land through redistribution was mentioned by the selected households as the most important reason for the transfer of land. Such redistribution of land would be regulated by the Instruction No. 0822/AF (cf. Chapter 3). However, redistribution of land was not realised during the process of formal land allocation. Additional pressure arose due to information about the Land Law ahead of the land allocation process. According to this Law, every member of a household may claim a maximum size of arable land of 1 ha. People often referred to the feared loss of area by redistribution of land among family members and relatives. The donation of land is the bequest at lifetime and frequently done to avoid and diminish governmental influences.

The decline and increase in farm land occupied by the households in the sample is presented according to the land use categories in Table 10.
Table 10: Transfer of area occupied by households in the sample by land use categories

<table>
<thead>
<tr>
<th>Land use type</th>
<th>Change in area in Napo</th>
<th>Change in area in Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increase [ha]</td>
<td>Decline [ha]</td>
</tr>
<tr>
<td>Irrigated wetland area (<em>na</em>)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wetland rainfed area (<em>na</em>)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Permanently used upland area (<em>hai</em>)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Upland area used under shifting cultivation (<em>hai</em>)</td>
<td>4 ➔ 18</td>
<td></td>
</tr>
<tr>
<td>Grazing land</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Orchards</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plantations</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unused land</td>
<td>0</td>
<td>2.54</td>
</tr>
<tr>
<td>No. of households</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Σ of the changes</td>
<td>5</td>
<td>20.54</td>
</tr>
<tr>
<td>Δ of the changes</td>
<td>➔ -15.54</td>
<td></td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999)

The data indicate that in Napo a decline of total area of the sampled households took place. Not any wetland area but the economically less attractive shifting cultivation areas as well as unused but claimed land were given to other members of the village community or given to descendants.

In Napo, the negative balance of the changes can be explained by the examination of selected individual households. Ten hectares of the category "shifting cultivation" were sold by a single household (cf. Appendix 04, household 3). The latter which included 5 persons (cf. Appendix 02), i.e. a relatively small household (average in Napo: 6.3 persons/household, cf. Chapter 2.2.), claimed 18 ha of upland fields under shifting cultivation before land allocation. These fields were used with a long fallow period of 24 years. Further 4 ha of shifting land were transferred by one household of the medium wealth group. These like the rest of land releases occurred through donation to relatives. At least, the transfer of the
two large parcels of land can be regarded as reaction on the forthcoming land allocation process.

In Khokpheun, the total size of land area used by the households remained relatively stable on average. The detailed examination of the release of land showed that only 3 households were affected. In 2 cases, the areas were given to descendants. One of the households (cf. Appendix 05, household 11) released 2 ha of orchards and 6 ha of wetland fields. Now, the total farm size of this household amounts to 0.8 ha/person (prior to land allocation: 2.4 ha/person), thus below average in the village at 0.93 ha/person (cf. Fig. 02, Chapter 4.2.). The release is attributable to the structure of the household. The parents are between 62 and 69 years of age. And it is only one daughter with her husband and a young child who live in the same household. The land was given to the families of the other children. Consequently, the land allocation caused the anticipation of bequest at lifetime. Another household claimed 18 ha prior to land allocation, of which 11.5 ha were unused. From the unused land 7 ha were released and 3 ha transformed into wetland rainfed fields. After land allocation, the household reported on 2.75 ha/person. The release of land in Khokpheun did not affect the wealth of this household as well as the social setting within the community. The household explained that the release of unused land was related to the forthcoming land allocation. A comparatively large number of households were concerned with an increase in area. However, the size of each additional parcel of land is relatively small (cf. Table 10).

As a whole, the land transfer indicates a tendency of redistribution towards the balanced land distribution which corresponds with the objectives of land allocation. Due to the transfer of less attractive land and economically interesting areas also transformations in land use types occurred in the village.
4.3.3. Transformation of the land use type

Beside transfer of area to other households, transformation of land use type took place in the sample, which was analysed by individual households after the deduction of the area transferred. These changes in land use type referring to the areas of the households in the sample in Napo and Khokpheun prior to and after the land allocation are presented in Table 11.

Table 11: Transformation of land use types of households in the sample

<table>
<thead>
<tr>
<th>Land use type</th>
<th>Change in land use in Napo</th>
<th>Change in land use in Khokpheun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigated wetland area (na)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>17.65</td>
<td>17.65</td>
</tr>
<tr>
<td>Wetland rainfed area (na)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>77.90</td>
<td>77.90</td>
</tr>
<tr>
<td>Upland (hai) (permanent used)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>4.90</td>
<td>3.90</td>
</tr>
<tr>
<td>Grazing land</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total area [ha]</td>
<td>123.7</td>
<td>123.7</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999)

The changes in land use type of areas used by the same household prior to and after land allocation (cf. Table 11) differ from the summarised changes as shown in Table 09. Accordingly, there was virtually no real transformation in land use by households in Napo, with the exception of one land parcel formerly used as orchard that was transformed into a teak plantation. Due to the information provided by the respective household, the transformation process wasn’t a planned activity, but caused by the availability of money and the offer to buy seedlings.

In Khokpheun, a noticeable change in land use by the individual households could be recognised. The initial land use type, the direction of change, the size of the
area transformed as well as the land use type after change are summarised in Table 12.

Table 12: Transformations of land use type conducted by households in the sample in Khokpheun from 1997 to 1999

<table>
<thead>
<tr>
<th>Land use type</th>
<th>Wetland (irrigated)</th>
<th>Wetland (rainfed)</th>
<th>Upland (permanent)</th>
<th>Upland (shifting)</th>
<th>Grazing land</th>
<th>Orchards</th>
<th>Unused land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area in 1997 [ha]</td>
<td>0</td>
<td>58.7</td>
<td>27.52</td>
<td>23.32</td>
<td>6.78</td>
<td>17.66</td>
<td>13.66</td>
</tr>
<tr>
<td>Wetland (irrigated)</td>
<td>-</td>
<td>-9.64</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wetland (rainfed)</td>
<td>+9.64</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>Upland (permanent)</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-6</td>
<td>0</td>
<td>0</td>
<td>-1.76</td>
</tr>
<tr>
<td>Upland (shifting)</td>
<td>0</td>
<td>0</td>
<td>+6</td>
<td>-</td>
<td>+4</td>
<td>+2</td>
<td>+2</td>
</tr>
<tr>
<td>Grazing land</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-4</td>
<td>-</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>Orchards</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-2</td>
<td>0</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Unused land</td>
<td>0</td>
<td>+3</td>
<td>+1.76</td>
<td>-2</td>
<td>+1</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Area in 1999 [ha]</td>
<td>9.64</td>
<td>52.06</td>
<td>35.28</td>
<td>9.32</td>
<td>11.78</td>
<td>19.66</td>
<td>9.90</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999)

The total size of irrigated wetland areas as well as of permanently used uplands, orchards and pasture had been extended. The size of the wetland rainfed, shifting cultivation and unused land had been decreased.

In Khokpheun, wetland rainfed fields were exclusively transformed into irrigated wetlands. Due to the construction of the irrigation canal by external initiation and financing as a pilot project, this important land use transformation into irrigated wetland can not be regarded as result of the land allocation.

Another important change was the significant decrease of upland shifting areas. These were either transferred to permanent management, mainly permanent upland area, but also grazing land and orchards. Two hectares of shifting area were taken out of use by maintaining the possibility of further cultivation. The formerly unused land was, if possible, transformed into productive land use types. Thereby preference was given to permanent land use types like wetland rainfed,
permanent upland and grazing land. The transformation of areas under shifting cultivation into permanent land use types (permanent upland and orchards) was explained by the farmers in relation to the change in market situation. On upland fields, rice is cultivated in crop rotation with vegetables. The cultivation and sale of vegetables results in higher farm income as compared to solely growing of rice and was therefore indicated as lucrative by the farmers. A critical aspect is the determination of the crop rotation by the demand of the markets. Sustainability of production is mainly not taken into account.

The area used as grazing land increased. Through the transformation of wetland rainfed fields into irrigated wetlands as well as shifting cultivation areas into permanent upland fields and orchards, possibilities for grazing animals during the dry season as well as on fallow land become restricted. Moreover, grazing land requires low input of labour that then can be assigned to permanent agriculture.

To sum up, the changes in land use type in both villages differ in kind and intensity. Generally, only a limited range of effects on farm land use occurred as a result of land allocation. Preference was given to the transfer of area compared to the transformation of land use.

All captured data on changes in land use type in the sample are summarised in Figures 05 and 06. The transformations in land use type are presented with regard to the initial/current land use type.
Land allocation - Process, results and discussion

Napo

Figure 05: Summarised changes in agriculturally used land and land use type of households in the sample in Napo (Source: Field survey, 1999)

Khokpheun

Figure 06: Summarised changes in agriculturally used land and land use type of households in the sample in Khokpheun (Source: Field survey, 1999)
Slight changes occurred in Napo. Those alterations were mainly restricted to transfer of area from one household to another.

Severe changes in area and land use were recognised in Khokpheun. Thereby, to the same extent, land was transferred to other households and transformed into other land use types.

In most cases, areas were transferred to members of the extended family. So, the safeguarding of the "tenure" status of the extended family could be safeguarded. Considering all transformations in land use type, preference was given to land use types with a high potential for production. Additionally, in the case that increase in production was not possible and sufficient land for production was available, the areas were taken out of production (unused land).
4.4. Implications of land allocation on forest land

4.4.1. Treatment of forests within the land allocation process

The territories of the surveyed villages were not unambiguously designated by customary usufruct rights and informal agreements with neighbouring villages prior to land allocation. Within the process of land allocation, the boundaries of the villages were fixed, agreed and legitimised. Detailed information about forest areas, which were used by the village community prior to land allocation, and the size of forests allocated to the village within the process of land allocation were not available. No official document, which indicates the legal tenure status as well as rights of use of common forest land, was conferred to the village. In addition, as the legal framework is mainly concerned with the allocation of agricultural land, the implementation of forest land allocation appears to be slightly more complex. The legalisation of forest land allocation through the assignment of deeds of ownership is not clearly outlined in the respective laws and regulations. The forest areas, which were allocated to the village communities, were used by them prior to the land allocation and were informally acknowledged by the villagers as commonage.

The changes in tenure of agricultural land indirectly affect the existence and preservation of forests. Through the allocation of agricultural land parcels not solely an extensification of farming by clearing of forest land is restricted. But prerequisites for the consolidation and preservation of forest areas were established.

Members of the village authorities confirmed, that households of both villages expressed the interest to claim individual forest land. The allocation of forest land to individual households was not realised within the framework of land allocation process. Members of the village authorities argued that this was due to the insufficient availability of areas for allocation. Both of the newly settled teak-plantations in the sample (one in each of the villages) were established on fields categorised as "land left over from the allocation of agricultural land".
Specific features of the allocation of forest land in Khokpheun

According to information provided by members of the village authority, around 40-50 ha of forest land were allocated to the village, 70% of which were designated as area for use. The remaining 30% were classified as protection forest. This information differ totally from the facts provided by the LAC. Due to the available report of the LAC, the village territory of Khokpheun contains 120 ha Conservation forest (Nature Conservation area), 1.6 ha sacred forest and 0.6 ha cemetery forest (LAC, 1997). Within the village territory, the LAC did not identify production forests. This general differentiation of zones in the report corresponds to the available village map, which was prepared by the LAC as a result of land allocation. On the map, too, no production forest is identified. However, the size of protection forest is identified as a size of about 300-400 ha in the map legend. This again does not correspond to the size of the area designated on the map. According to a field examination, the map itself is partly incomplete and not corresponding to field conditions.

Information regarding village forest land was not confirmed by the households in Khokpheun. The households stated differing knowledge about village forest land.

Specific features of the allocation of forest land in Napo

In Napo a special working group, consisted of members of the LAC and villagers, was formed to conduct surveying of forests within the village territory, as well as their allocation. Further records of the procedure were not available. The size of the forest area was not documented in official reports.

A village map was drawn up and published as a board in the village. This map indicates the different land use zones (cf. Photo 01, Chapter 4.1.2.). Following forest types were determined on the village territory: production forest, mixed forest, bamboo forest, high-grade forest, cemetery forest as well as conservation and protection forest.

In Napo, agricultural and forest land were differently treated within the process of land allocation. A special working group was formed to implement forest land allo-
cation in Napo. Nevertheless, the agriculturally used land was the main area of intervention. Even in Napo, direct and indirect consequences on common forest land result from land allocation: For the first time, forests within the village territory are defined and their boundaries legitimised after land allocation. The boundaries of forest areas and officially determined rights in use as well as limitations in use are known by the members of the village community. After land allocation, the responsibility and competence for use and management of forests is formally assigned to the community. Due to the determination of forests and the allocation of forest land to the village community, the possibility to control the compliance with the officially determined rights of use and if necessary to sanction offence against, inter alia, illegal use of resources or unauthorised transformations in use. Thus, important preconditions for controlled forest management at local level were established.

To sum up, differences between both villages exist mainly regarding the knowledge of villagers of the forests on village territory. In Khokpheun, the statements of households regarding size, defined use and locality of forest areas varied. However, those data were never identical with the information provided by the LAC. In Napo, the information of households related to forests on village territory largely coincided with the official information, which, as a result of the land allocation, was published in the village.

In both villages, differences in the quality of data were ascertained. In Napo, boundaries of forest land and different forest zones were determined. On this basis data acquisition could be continued and preconditions created for their use for a prospective Land Information System. In Khokpheun the documentation of size and location of forest land was performed inconsistently and incompletely. This was an impediment for data assignment and their further use.
4.4.2. Implications of land allocation on forest use in Napo and Khokpheun

In each village, the mayor nominates a villager as "village forester". This person has to attend a four-day course organised by the DAFO, which is concerned with the protection of forests and hunting as well. The "village forester" in his capacity as an honorary officer may be contacted by the villagers regarding matters of forests and forest use. However, he is not authorised to take decisions. Main duties comprise the control of use and if necessary the report of violations of uses regulations to the DAFO. In his field, he mainly acts as mediator between the DAFO and the village authority as well as between households and village authority.

Extraction of Non-wood forest products (NWFP)

The extraction of NWFP's includes the collection of bamboo and rattan shoots, mushrooms, herbs as well as the extraction of bamboo for construction purposes and for the manufacture of household appliances. Extractions of these products for own consumption is unrestricted in allocated common productive forests. In the case of commercial use, a prior permission by the Province authority is required.

Bamboo shoots and mushrooms are collected during the rainy season by all households in Napo and by around 90% of the households in Khokpheun. The frequency of collection varies not only between individual households, but also with availability of food. In Khokpheun, an individual household usually collects mushrooms and bamboo shoots once a week. Compared with this, the frequency strongly varies in Napo. Some households extract these products daily. On average, mushrooms and shoots are collected once or twice a week by the interviewed households. Then, between 0.2 and 0.4 kg of bamboo shoots per household member were extracted per collection. Due to the different availability of mushrooms, the collected amount could not be estimated by households. In general, like mentioned by the interviewed households, the wide range of used products as well as the amount of extracted NWFP's was not affected over the last years.
Wood extraction

The extraction of wood-products includes firewood and timber. Firewood is required by all households for the preparation of food. According to the information of the interviewed households, only dead branches or wood from dead trees from own agricultural parcels as well as from common forest land are collected for this purpose. The households estimated a demand for firewood of around 0.02 stacked cubic metres per person and day. This results in a calculated demand of 7.3 stacked cubic metre firewood per person and year. The relatively high values refer to estimations of irregular heaps; stacked timber is not referred to here. Moreover, households use predominantly branches with diameters less than 10 cm. Firewood is solely collected for own consumption, not for sale. The extracted amount of firewood, like indicated by the interviewed households, has not been affected by changes over the last years.

The rules and regulations concerning the individual use of timber differ between the surveyed villages. In both villages, the amount of timber, which can be used individually by a single household, is determined by the village authority. The respective household has to submit an application. An important prerequisite for the permission is, that the household has no timber at its disposal on own land or that the timber is exclusively used for house construction or reconstruction but not for sale.

In Khokpheun, every household without timber on own land, has a legitimate claim to at maximum 7-8 m³ timber from the common forest land, which is determined by the village community as productive forest. For this timber, a fee, which in advance was fixed by the village authority, has to be paid. The money remains on an account of the village. In Napo, the timber has to be given to the households free of charge. Due to high expenses to be paid for sawing of the wood, only a limited number of households can harvest sufficient timber for construction purposes. In both villages, the individual extraction of timber is restricted to some tree species. The use of high-grade tree species, which were determined by the Ministry of Agriculture and Forestry, is not authorised (e.g. Dalbergia sp., Pterocarpus macrocarpus). Internal use of timber by the village for public construction purposes was
similarly regulated prior to land allocation. Households without timber on claimed fields had the possibility to use timber from forests of the village. As the areas were not officially allocated to the village in the past, no legal claim to the use existed. By interviews it was also confirmed that in both villages the availability of utilisable tree species at required dimensions had strongly decreased. Many of the valuable tree species remain on difficult accessible places (far from the village, no road, hilly sites), which form an impediment to their exploitation.

Though, according to information provided by the village authority, that every household is legally entitled to the use of timber from common land, unauthorised extraction of timber occurs. Illegal logging should be reported to the district officials and afterwards punished.

So far, both villages were not granted the right to participate in management and commercial use of village forests, especially in logging and timber sale. The studied village communities remain excluded from management of forests and commercialisation of timber after land allocation. As currently the know-how as well as the material basis for independent steering of sustainable forest management are missing in the selected villages, these restrictive measures have to be understood as a measure to protect the forests from uncontrolled exploitation. However, these restrictions hamper the interest of the indigenous population in forests, and so, also the interest of villagers to support efforts towards sustainable management of common forests.

A village forestry project was not introduced in the selected villages. Through the assignment of rights and responsibilities for forest areas within the village boundaries, important prerequisites for the further implementation of Village Forestry were established as a result of land allocation.
Hunting

By tradition, game is an important source of protein for the interviewed households. Hunting is practised, both, in forests and on agricultural land. More than 90% of the interviewed households in Napo reported that until 1998 at least one member of the household was a frequent hunter. In Khokpheun only members of around 50% of the selected households were involved in hunting. In 1998, based on a governmental initiative, hunting weapons were confiscated. Now, in both villages, hunting is mainly practised with traditional weapons like traps, snares, catapult, crossbow or bow and arrow. Due to the location of Khokpheun on the banks of the Mekong river, fishing plays an important role, too.

As mentioned by the households, especially in Napo, importance of hunting has not fundamentally changed over the past few years. Despite the confiscation of hunting weapons, the amount of captured game remained unaffected. The higher amount of captured small game (e.g. bamboo rats, birds) is caused by the general decline of big game caused by overexploitation of game prior to the confiscation of weapons.
Summed up, the previous use of forest products (wood- and non-wood-products) by villagers is still practised after the land allocation. While the extraction of timber remains limited under state regulation, the use of other forest products from village forests is controlled by internal rules of the village. Excluding the extraction of timber, the former customary use of forest products was confirmed and brought on a legal basis. So, the previous practice of forest use, which only marginally differed between both villages, continues to exist. In general, no changes in the use of wood- and non-wood-products were caused by the land allocation. A change in the regimentation of use was not reported by interviewees.
Conclusions and recommendations

5. Conclusions and recommendations

5.1. The process of land allocation

The implementation of land allocation in both of the villages under study adhered to the legal framework and was orientated by steps formulated in the "Instruction on Land - Forest Allocation for Management and Use". The Process was conducted by the District Land Allocation Committee (LAC).

The examination of land allocation process showed that there are knowledge and knowledge application gaps in households of both villages. From this, conclusions can be drawn regarding the conveyance of information on land allocation on the part of LAC and the village authorities as well as the interest taken in land allocation and the understanding of land allocation on the part of the villagers. This allows to infer that the necessity exists to improve the flow of information between LAC and village, thus strengthening the interest of the villagers in land allocation. It requires personnel strengthening (e.g. additional training of staff of the LAC) and organisational changes. So especially the intensive preparation in the village was identified as important requirement. The shift from customary rights in land use towards a legally secured tenure status represents an essential change of the interrelationship between local rural population and the state/government. Such a far-reaching change requires a long period of time to create understanding of the process and the respective consequences.

The process of implementation was differently organised in the villages under study. In Napo, 2 working groups were formed whereas 5 groups were working in Khokpheun. In Napo, one team was responsible for agricultural land and one for forest land. The allocation of forest land was supported by foresters of the NUOL. A clear distinction between agricultural and forest land was undertaken. The differentiation between agricultural and forest land seems to be useful as it was confirmed by the results of the interviews in Napo. Here, the information of households regarding forest land of the village largely coincided with the official information. Most households were aware of village forest land, its locality and
Conclusions and recommendations

legal use. Despite the formation of 5 working groups in Khokpheun, no differentiation between agricultural and forest land was documented. Due to the surface of the village Khokpheun and the lower importance of forests for livelihood, the total area of the village was divided among the teams. Special attention was paid to agricultural land parcels. This was apparent in the knowledge of households about village forests. In Khokpheun, the statements of households regarding size, defined use and locality of forest areas varied. However, those data were never identical with the information provided by the LAC.

As a result of the land allocation, village boundary was demarcated in both villages. The demarcated village area was assigned to the responsibility of the village. All individual land parcels reported by households in both villages were surveyed and sketches were drawn. Those individual land parcels were registered and temporary land certificates were conferred. So, no changes of the pattern of land holdings and consequently social structure were linked to land allocation.

Due to the implementation of land allocation within a short period of time, not all expected results were attained. An unknown number and size of land parcels claimed but not reported by households and unregistered were notified in both villages after land allocation. This requires, both, continuation of land allocation in the field and adaptation of the implementation strategy to local conditions. The results of the study also show that participation of villagers in the registration and allocation process can be improved through intensive preparation in the village. This includes transparency in work, clear structuring of the implementation process as well as conscientious documentation of the implementation.

By now, land allocation deals mainly with agricultural land. Forest land is considered marginally and unclear. Due to the importance of agriculture for the livelihood of the rural households in Laos, a primary orientation of land allocation on agricultural land is assessed as necessary, practicable and widely accepted. Moreover, the allocation of agricultural fields implies positive effects on forests. If agricultural land is fixed, the expansion of agriculture on forest land could be controlled or even avoided. In order to guarantee the long-term preservation of forests at village level, the allocation of forest land to the village community should
be put more attention in future. From exclusion of forests from real allocation process in Khokpheun and the vague results in Napo the conclusion is drawn that village forestry strategy is developed insufficiently yet. Further development of village forestry should be aimed at.
5.2. Land management

5.2.1. Land information management

The establishment of a land information system demands certain technical, organisational and institutional measures. Among others, these refer to standards for data collection and management, standards for personnel arrangements and administrative organisation as well as legal frame conditions and political support.

The results obtained from this study shows that the implementation of land allocation in the villages Khokpheun and Napo provides opportunities for the development of a multipurpose Land Information System (LIS). This would form an important prerequisite for administration and management of land resources in general.

However, along with the land allocation process, data purposefully to be used for the creation and management of an land information system were gathered. Parcel wise data on land holder, size, locality and land use were collected.

So far, the collected data are predominantly used for fiscal purposes (taxation). Possibilities of a broader use of the data were not taken into account. In future, the existing data base could be used by different governmental agencies as basis for e.g. regional development and rural extension programs. As not all possibilities for use of the collected data were exhausted, it is recommended to conduct investigations on the design of an adequate LIS to cover the country specific needs and requirements for land information management in Laos. Further research should also include the analysis of organisational and institutional requirements for the establishment and management of a LIS. Based on this assessment one can ascertain which data are needed for which purpose, who will be responsible for administration of data and how to collect and update them. Land allocation should be integrated in the establishment process of such a database in future.

In both villages, data were collected with simple methods (hand-written notes and sketch maps) within a short period of time. The methods were adapted to the
financial capacity of the implementing institution as well as the ability of the implementing staff. However, due to the varying quality of data, the collected data are relatively difficult to make available for additional use. Because of the hitherto type of assessment and utilisation of land information in Laos, the elaboration of standards for data collection will be required in future.

5.2.2. Land resource management

Agricultural land use

As a result of land allocation, the boundaries of the village territories were determined and legally acknowledged. Zones of different land use based on the actual land use were defined. Agricultural fields were surveyed and temporary land certificates together with land use agreements conferred to the households. So, land use by area and pattern has been identified and fixed by contract.

Legal security on land and land use was created. The examination ascertained that a redistribution of land parcels happened which was initiated by the announcement of land allocation and realised by individual households prior to the formal process. Households with relatively big land holdings gave parcels of land to relatives and friends with no land and/or small land holdings. This can be assessed as an option to initiate sustained agricultural land use of defined land resources.

In addition, the taxation of household farm land can be understood as an incentive towards intensive land use. However, the case studies showed that households can only use incentives for changes if suitable frame conditions for those alterations are available. In Khokpheun such conditions were mainly given through market demand for certain products (e.g. vegetables), access to respective markets and technical possibilities for intensification especially by the new irrigation canal. Here a change towards intensive and permanent land use types took place. In contrast to this, only little changes in agricultural production system took place in Napo. The unchanged agricultural production in Napo can be
Conclusions and recommendations

ascribed to missing or inappropriate frame conditions. Land allocation, exclusively, did not induce changes in land use.

Due to the different impact of land allocation in both villages, data collected within the process of land allocation could also be used to develop an adapted taxation system. Conceivable would be a taxation system considering different possibilities for the increase of productivity. Thereby a lower tax rate should be applied in the case of missing possibilities for intensification. In addition, the diversification of household income from off-farm sources has to be aimed at in regions with unfavourable frame conditions for agricultural intensification. Potentialities may lie especially in the field of soil-independent income (e.g. crafts).

Forestry at village level

Within the process of land allocation, forest land within the village territory was defined and allocated to the village community. Responsibilities for use were conferred upon the villages. The traditional use of forest products for their private consumption is permitted for the village community. This customary use of forests was not restricted or changed by the allocation of area and is now legitimised. However restrictions still exist. In this respect, the village community has not got the capability to realise sustainable forestry on their own.

Substantial differences between both villages regarding the knowledge of allocated forest land by the surveyed households were discernible. It could be ascertained for Napo that all households in the sample were aware of the allocated forest land and its possible and legitimised use. In Khokpheun, the knowledge of households in the sample, of the members of the LAC and of the village authorities regarding allocated forest land and its use varied and were often not appropriate. This refers to flaws in the implementation of allocation and can be interpreted - with reservations - as little interest of villagers in forests. As allocation of agricultural parcels was recognised as the first ranking task, only little attention was paid to forest land allocation. In order to also achieve in Khokpheun that those areas are acknowledged by the village community, misunderstandings should be
tried to overcome. In this context, the allocation of forest land should be explained and possibly supplemented or repeated.

The case studies do not point to a strengthening of the local interest in forest preservation. In addition, qualitative or quantitative changes of forest utilisation and management due to land allocation are not recognisable from the case studies. If this is to be achieved, a higher economic appeal of the forest for the communities by a stronger involvement in its commercial utilisation and management would be required. The economic appeal of the forest most likely would be increased by the allocation of forest areas to individual households. The households in both villages expressed their interest in this regard. So far, a limited number of households established reforestation on unused agricultural land parcels. The basis for enhancing local responsibility and freedom of decision or a conferment of the forest usufructuary right would be the creation of adequate organisational entities and provisions for this utilisation. These developments, which are aimed at in Laos, are still in an initial stage. The development of concepts for forest management at village level (e.g. Village Forestry) belongs to it.

Due to the initial stage of the development of forest management at village level, it would be advisable to conduct the implementation of village forestry in the field in combination with research projects. In this context, the evaluation of Village Forestry as intended and implemented in several projects would be an important field of research. Additionally, investigations on the feasibility of village forestry models in Laos would be relevant for further development of an adequate village forestry strategy.
References


EHRHARDT, Walter. 1997. **Proposals for the people’s forest management and work responsibilities of extension staff in the training and model forest of the VFC.** Project report. GTZ, Vientiane.

EHRHARDT, Walter. (undated). **Survey report on land use and land use tenure of College Intervention Area and agreements with villagers on future land use.** Project report. GTZ, Vientiane.

FAO. 1989. **Forestland to the people: A forest village project in Northeast Thailand.** Bangkok.


FOMACOP. 1996. **Participatory forest management planning.** Discussion paper No. 13. Vientiane, Lao PDR.


FOMACOP. 1997. **Stumpage income distribution in village forestry.** Discussion paper No. 20. Vientiane, Lao PDR.


GASTON, Graham. 1995. Land tenure, use rights and titling of agricultural and forestry lands. NAWACOP/GTZ, Lao PDR.

GOL (Government of Laos). 1989. Decree of the Council of Ministers on the management, the utilisation of forests and forest land, No. 117/PCM. Vientiane, Lao PDR.

GOL. 1989a. Temporary provision on the management and use of agricultural land in Lao PDR, No. 22/CPM. Vientiane, Lao PDR.

GOL. 1990. Property law, No. 00119. Vientiane, Lao PDR.


GOL. 1993. Decree on land tax, No. 50/PM. Vientiane, Lao PDR.

GOL. 1993a. Decree on organisation and administration of villages. No. 102/PM. Vientiane, Lao PDR.


GOL. 1994b. The decision about the permission to use a forest area in the Sang Thong district, Vientiane Municipality, for the establishment of a TMF for VFC.


GOL. 1996a. Instruction on the Continuation on Implementing Land Management and Land-Forest Allocation, No. 03/PM. Vientiane, Lao PDR.
GOL. 1996b. Order on Customary Rights and the Use of Forest Resources, No. 0054/MAF. Vientiane, Lao PDR.


GOL. 1996d. The Forestry Law No. 01-96. Vientiane, Lao PDR.


References


MAF. 1996. *Instruction on land and forest allocation on management and use, No. 0822/AF.* Vientiane, Lao PDR.


NEUMAN. 1994. **Social research methods: qualitative and quantitative approaches.** Allyn and Bacon, Boston.


PHENG, Souvonthong 1995. **Shifting cultivation in Lao PDR, An overview of land use and policy initiatives.** Department of Forestry, Lao PDR.


# List of tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 01</td>
<td>Wealth groups of the households and their indicators</td>
<td>07</td>
</tr>
<tr>
<td>Table 02</td>
<td>Characteristics of the village population</td>
<td>08</td>
</tr>
<tr>
<td>Table 03</td>
<td>Characteristics of the sample in comparison with the total village population</td>
<td>09</td>
</tr>
<tr>
<td>Table 04</td>
<td>Historical development of the tenure system of agricultural and forest land</td>
<td>15</td>
</tr>
<tr>
<td>Table 05</td>
<td>Land types and their treatment within the land allocation</td>
<td>22</td>
</tr>
<tr>
<td>Table 06</td>
<td>The stages of the process of land allocation</td>
<td>23</td>
</tr>
<tr>
<td>Table 07</td>
<td>Process of land allocation in Napo and Khokpheun by stages</td>
<td>36</td>
</tr>
<tr>
<td>Table 08</td>
<td>The land tenure status of households in the sample in Napo and Khokpheun before and after the land allocation</td>
<td>40</td>
</tr>
<tr>
<td>Table 09</td>
<td>Summarised information of agricultural area and land use in the sample in Napo and Khokpheun before and after the land allocation</td>
<td>46</td>
</tr>
<tr>
<td>Table 10</td>
<td>Transfer of area occupied by households in the sample by land use categories</td>
<td>50</td>
</tr>
<tr>
<td>Table 11</td>
<td>Transformation of land use types of households in the sample</td>
<td>52</td>
</tr>
<tr>
<td>Table 12</td>
<td>Transformations of land use type conducted by households in the sample in Khokpheun from 1997 to 1999</td>
<td>53</td>
</tr>
</tbody>
</table>
## List of figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Knowledge and the use of knowledge of households in the sample within the</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>process of land allocation</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Size of agricultural land holding per person in the sample</td>
<td>42</td>
</tr>
<tr>
<td>03</td>
<td>The size of wetland areas (na) per person in the sample in Napo and Khokpheun</td>
<td>43</td>
</tr>
<tr>
<td>04</td>
<td>The size of upland areas (hai) per person in the sample in Napo and Khokpheun</td>
<td>44</td>
</tr>
<tr>
<td>05</td>
<td>Summarised changes in agriculturally used land and land use type of</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>households in the sample in Napo</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Summarised changes in agriculturally used land and land use type of</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>households in the sample in Khokpheun</td>
<td></td>
</tr>
</tbody>
</table>
# List of illustrations

| Photo 01: | Land use map of the village Napo | 34 |
| Photo 02: | Hunter in Napo | 63 |

**Illustrations in appendix 11:**

- Photo 03: Wetland rainfed fields in Napo
- Photo 04: Preparation of upland fields by fire clearance in Napo
- Photo 05: Insight in the village Napo
- Photo 06: Wetland fields used as pasture in the dry season
- Photo 07: Irrigated wetland fields and irrigation canal in Khokpheun
- Photo 08: Vegetable gardens at the banks of the Mekong river near Khokpheun
List of appendices

Appendix 01: Interview protocol
Appendix 02: Socio-economic data of households in the sample in Napo
Appendix 03: Socio-economic data of households in the sample in Khokpheun
Appendix 04: Summarised data on land and land use of households in the sample in Napo
Appendix 05: Summarised data on land and land use of households in the sample in Khokpheun
Appendix 06: Location of the villages
Appendix 07: Special characteristics of the surveyed villages
Appendix 08: Administrative structure of the villages
Appendix 09: Agricultural production in the study area - terms and explanations
Appendix 11: Illustrations
Appendix 01

Interview protocol
Interview protocol (households)

1. General information about the household
   - Number of household members
   - Age of the household members
   - Ethnic affiliation of the household
   - Education and profession of the household members
   - Main occupation of the household (related to household economy)
   - Duration of settlement in the village

2. Land allocation
   - Procedure of land allocation in general and on own land, land registration and land allotment
   - Information of household members about land allocation
   - Participation in procedure of land allocation
   - Effects of land allocation on tenure status of land of the household
   - Changes in the size of land holding of the household related to LA
   - Changes in the area of the household (redistribution of land)
   - Influence of land allocation and distribution on the land holding of the household (e.g. soil fertility, land suitability)
   - Opinions about land allocation and influence of land allocation on the village as well as the household

3. Current land use
   - Number of plots used by the household
   - Size of the plots, crops and yield
   - Tenure status of each piece of land
   - Origin of the land and first year of use

4. Land use before land allocation
   - Number of plots used before land allocation
   - Size of the plots, crops and yield
   - Tenure status of each piece of land
   - Origin of the land and first year of use
5. Animal husbandry
   - Number of animals
   - Size of the individual grazing land
   - Tenure status of individual grazing land
   - Use and existence of common grazing land, regulation for use of common grazing land

6. Forest utilisation
   - Used products
   - Used for which purpose (own consumption, sale or ...)
   - Locality of extraction
   - Owner of the exploitation locality
   - Individual or collective use of the locality
   - Amount of extracted products
   - Changes in the use of forest products
Appendix 02

Socio-economic data of households in the sample in Napo
<table>
<thead>
<tr>
<th>Household No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio economic Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>11</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>ranking group (a)</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ethnic affiliation (b)</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>origin (c)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>persons/age class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6-15 years</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>16-25 years</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>26-35 years</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36-45 years</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>46-60 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 60 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Head of the household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>42</td>
<td>45</td>
<td>70</td>
<td>46</td>
<td>45</td>
<td>48</td>
<td>39</td>
<td>62</td>
<td>42</td>
<td>45</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Wife</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>30</td>
<td>36</td>
<td>50</td>
<td>37</td>
<td>35</td>
<td>47</td>
<td>29</td>
<td>47</td>
<td>37</td>
<td>0</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>primary school</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>secondary school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
<table>
<thead>
<tr>
<th>Household No.</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio economic Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>10</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>9</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>ranking group (a)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ethnic affiliation (b)</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>origin (c)</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>persons/age class</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6-15 years</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>16-25 years</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>26-35 years</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36-45 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>46-60 years</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 60 years</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Head of the household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>51</td>
<td>47</td>
<td>35</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>52</td>
<td>25</td>
<td>39</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>1</td>
<td>1(4)</td>
<td>1</td>
<td>1</td>
<td>1(4)</td>
<td>1</td>
<td>1(4)</td>
<td>1</td>
<td>1(4)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Wife</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>49</td>
<td>46</td>
<td>26</td>
<td>44</td>
<td>70</td>
<td>43</td>
<td>16</td>
<td>45</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Other family members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>primary school</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>secondary school</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vocational school</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>main occupation</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
## Household Economic Data

<table>
<thead>
<tr>
<th>Household No.</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio economic Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ranking group (a)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ethnic affiliation (b)</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>origin (c)</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>persons/age class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-15 years</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25 years</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-35 years</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36-45 years</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46-60 years</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>over 60 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Head of the household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>50</td>
<td>36</td>
<td>23</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wife</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>48</td>
<td>35</td>
<td>22</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other family members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary school</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary school</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>main occupation (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
Appendix 03

Socio-economic data of households in the sample in Khokpheun
<table>
<thead>
<tr>
<th>Household No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>ranking group (a)</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ethnic affiliation (b)</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>origin (c)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>persons/age class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6-15 years</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>16-25 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>26-35 years</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36-45 years</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>46-60 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>over 60 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Head of the household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>40</td>
<td>31</td>
<td>41</td>
<td>40</td>
<td>33</td>
<td>48</td>
<td>39</td>
<td>33</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wife</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>32</td>
<td>30</td>
<td>36</td>
<td>24</td>
<td>21</td>
<td>39</td>
<td>30</td>
<td>31</td>
<td>20</td>
<td>47</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Other family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>primary school</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>secondary school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
<table>
<thead>
<tr>
<th>Household No.</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>ranking group <em>(a)</em></td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ethnic affiliation <em>(b)</em></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>origin <em>(c)</em></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>persons/age class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6-15 years</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>16-25 years</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>26-35 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>36-45 years</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>46-60 years</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>over 60 years</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Head of the household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>69</td>
<td>43</td>
<td>57</td>
<td>38</td>
<td>33</td>
<td>40</td>
<td>33</td>
<td>28</td>
<td>37</td>
<td>55</td>
</tr>
<tr>
<td>educational level <em>(d)</em></td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>main occupation <em>(e)</em></td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4(1)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Wife</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>62</td>
<td>37</td>
<td>47</td>
<td>32</td>
<td>29</td>
<td>42</td>
<td>21</td>
<td>21</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>educational level <em>(d)</em></td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>main occupation <em>(e)</em></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Other family members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>primary school</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1(1)</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>secondary school</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Household No.</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>---------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td><strong>Socio economic Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of persons</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>ranking group (a)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ethnic affiliation (b)</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>origin (c)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>persons/age class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6-15 years</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16-25 years</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>26-35 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>36-45 years</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>46-60 years</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 60 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Head of the household</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>38</td>
<td>45</td>
<td>39</td>
<td>32</td>
<td>32</td>
<td>48</td>
<td>38</td>
<td>46</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4(1)</td>
<td>1</td>
<td>1</td>
<td>4(1)</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Wife</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age [year]</td>
<td>37</td>
<td>38</td>
<td>38</td>
<td>25</td>
<td>29</td>
<td>42</td>
<td>21</td>
<td>36</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>educational level (d)</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Other family members</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>illiterate</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>primary school</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>secondary school</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>main occupation (e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
### Household No.

<table>
<thead>
<tr>
<th></th>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
<th>35</th>
<th>36</th>
<th>37</th>
<th>38</th>
<th>39</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Socio economic Data

<table>
<thead>
<tr>
<th>Persons/age class</th>
<th>0-5 years</th>
<th>6-15 years</th>
<th>16-25 years</th>
<th>26-35 years</th>
<th>36-45 years</th>
<th>46-60 years</th>
<th>over 60 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Head of the household

<table>
<thead>
<tr>
<th>Age [year]</th>
<th>29</th>
<th>46</th>
<th>37</th>
<th>25</th>
<th>32</th>
<th>52</th>
<th>28</th>
<th>41</th>
<th>37</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational level (d)</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Main occupation (e)</td>
<td>1(3)</td>
<td>1(4)</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

### Wife

<table>
<thead>
<tr>
<th>Age [year]</th>
<th>19</th>
<th>39</th>
<th>26</th>
<th>19</th>
<th>30</th>
<th>43</th>
<th>23</th>
<th>36</th>
<th>21</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational level (d)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Main occupation (e)</td>
<td>5</td>
<td>5</td>
<td>6(5)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

### Other family members

<table>
<thead>
<tr>
<th>Number</th>
<th>2</th>
<th>2</th>
<th>2</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>1</th>
<th>5</th>
<th>2</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Primary school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Secondary school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vocational school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
Appendix 04

Summarised data on land and land use of households in the sample in Napo
<table>
<thead>
<tr>
<th>Household No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0.750</td>
<td>0.500</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2.300</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>3.200</td>
<td>8</td>
<td>18</td>
<td>3</td>
<td>4.500</td>
<td>3</td>
<td>3</td>
<td>4.750</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>1.5 (1.7)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1 (0.5)</td>
<td>1</td>
<td>1</td>
<td>1 (0.75)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>6</td>
<td>24</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>2</td>
<td>6</td>
<td>24</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1.500</td>
<td>1</td>
<td>1.500</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0.010</td>
<td>0</td>
<td>0</td>
<td>0.0625</td>
<td>0.0625</td>
<td>0.064</td>
<td>0.010</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.500</td>
<td>0</td>
<td>0.100</td>
<td>0</td>
<td>0.500</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0.750</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
</tr>
<tr>
<td>After land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0.750</td>
<td>0.500</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2.300</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>3.200</td>
<td>6</td>
<td>8</td>
<td>3</td>
<td>2.500</td>
<td>3</td>
<td>3</td>
<td>4.750</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>1.5 (1.7)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1 (0.5)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>4</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>2</td>
<td>4</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1.500</td>
<td>1</td>
<td>1.500</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0.010</td>
<td>0</td>
<td>0</td>
<td>0.0625</td>
<td>0.0625</td>
<td>0.064</td>
<td>0.010</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.500</td>
<td>0</td>
<td>0.100</td>
<td>0</td>
<td>0.500</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0.750</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>1.500</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>0</td>
<td>1,2,6</td>
<td>3,7</td>
<td>0</td>
<td>7,5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5,6</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>21</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>1.3</td>
<td>1.23</td>
<td>1</td>
<td>1.3</td>
<td>2.3</td>
<td>2.3</td>
<td>1.23</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>% per different origin</td>
<td>53;47</td>
<td>6;19;75</td>
<td>100</td>
<td>55;45</td>
<td>64;36</td>
<td>20;20;60</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
## Land use pattern

<table>
<thead>
<tr>
<th>Household No.</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0.500</td>
<td>0.500</td>
<td>0.600</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>4</td>
<td>4</td>
<td>1.400</td>
<td>5.400</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>5.250</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>2</td>
<td>2</td>
<td>0.700</td>
<td>2.700</td>
<td>1</td>
<td>1</td>
<td>*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0.004</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0.500</td>
<td>0</td>
<td>0.300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>1.500</td>
<td>4.500</td>
<td>4.540</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>After land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0.500</td>
<td>0.500</td>
<td>0.600</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>4</td>
<td>4</td>
<td>1.400</td>
<td>5.400</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>5.250</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>2</td>
<td>2</td>
<td>0.700</td>
<td>2.700</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5.250</td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5.250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0.004</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0.500</td>
<td>0</td>
<td>0.300</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>1.500</td>
<td>4.500</td>
<td>4.540</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Reason for change</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Land title</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(g)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Origin of the land</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(h)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% per different origin</td>
<td>100</td>
<td>56.44</td>
<td>100</td>
<td>22.78</td>
<td>100</td>
<td>67.33</td>
<td>25.75</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
<table>
<thead>
<tr>
<th>Household No.</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>6.900</td>
<td>5.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>2</td>
<td>2(1.5)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>useful time [year]</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>6.900</td>
<td>5.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>2</td>
<td>2(1.5)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>useful time [year]</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>% per different origin</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
Appendix 05

Summarised data on land and land use of households in the sample in Khokpheun
<table>
<thead>
<tr>
<th>Household No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land use pattern</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Before land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0.800</td>
<td>1</td>
<td>2.500</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>3</td>
<td>2.500</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>1</td>
<td>1 (1.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>2</td>
<td>0.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0.320</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>After land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0.800</td>
<td>1</td>
<td>1.5 (1.5)</td>
<td>1</td>
<td>1 (4)</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>1.500</td>
<td>2.500</td>
<td>1</td>
<td>2.800</td>
<td>1</td>
<td>0</td>
<td>0.960</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>2</td>
<td>0.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0.320</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>1,6</td>
<td>6,2</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1,6,11</td>
<td>12</td>
<td>0</td>
<td>6,2</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>3</td>
<td>1,3</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>% per different origin</td>
<td>100</td>
<td>33,67</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
<table>
<thead>
<tr>
<th>Household No.</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>0.640</td>
<td>0.480</td>
<td>1</td>
<td>0</td>
<td>5.500</td>
<td>2.500</td>
<td>1.980</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>3.520</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>1</td>
<td>1</td>
<td>0.480</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td>2</td>
<td>8</td>
<td>12</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>4</td>
<td>0</td>
<td>0.800</td>
<td>0.640</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0.640</td>
<td>1.360</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.360</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0.640</td>
<td>0.480</td>
<td>1</td>
<td>0.160</td>
<td>5.500</td>
<td>2 (0.5)</td>
<td>1.5 (0.48)</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>3.520</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td>1</td>
<td></td>
<td></td>
<td>0.480</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0.960</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>2</td>
<td>0</td>
<td>0.800</td>
<td>0.640</td>
<td>0</td>
<td>1</td>
<td>0.800</td>
<td>0.640</td>
<td>1.360</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.360</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>5</td>
<td>8</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>% per different origin</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>13.87</td>
<td>62.38</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
<table>
<thead>
<tr>
<th>Household No.</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land use pattern</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Before land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1.500</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0.160</td>
<td>0.500</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2.500</td>
<td>0</td>
<td>1.320</td>
<td>0</td>
<td>0</td>
<td>0.800</td>
<td>7.200</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.200</td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>2.500</td>
<td>0.480</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.320</td>
<td>0</td>
<td>0</td>
<td>0.160</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.800</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>After land allocation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>2.5 (2.5)</td>
<td>2</td>
<td>1</td>
<td>1.500</td>
<td>0.480</td>
<td>2</td>
<td>0.320</td>
<td>0</td>
<td>0.160</td>
<td>2</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>3</td>
<td>0</td>
<td>0.800</td>
<td>0.500</td>
<td>1.500</td>
<td>0.480</td>
<td>1.320</td>
<td>0</td>
<td>1.680</td>
<td>0.800</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.500</td>
<td>0.8 (0.88)</td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>2.500</td>
<td>0.480</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0.320</td>
<td>0</td>
<td>0</td>
<td>0.240</td>
<td>0.160</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>6.11</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>3.9</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>1.2</td>
<td>1</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2.1</td>
</tr>
<tr>
<td>% per different origin</td>
<td>62;38</td>
<td>100</td>
<td>100</td>
<td>50;50</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>22;78</td>
</tr>
<tr>
<td>Household No.</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>--------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Land use pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>2</td>
<td>4</td>
<td>1.500</td>
<td>0</td>
<td>0.500</td>
<td>4.500</td>
<td>0</td>
<td>0</td>
<td>5.500</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1.500</td>
<td>2.500</td>
<td>0</td>
<td>1</td>
<td>2.500</td>
<td>0</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0.480</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
<td>0.320</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>11.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>After land allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>na (rainfed/irrigated) [ha]</td>
<td>1 (1)</td>
<td>7</td>
<td>1.500</td>
<td>0.320</td>
<td>0.500</td>
<td>4.500</td>
<td>1</td>
<td>0</td>
<td>5.500</td>
<td>0</td>
</tr>
<tr>
<td>hai (perm./rotation) [ha]</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1.180</td>
<td>1.500</td>
<td>2.500</td>
<td>0.500</td>
<td>1</td>
<td>2.500</td>
<td>0</td>
</tr>
<tr>
<td>used per year [ha]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useful time [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fallow period [year]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grazing land [ha]</td>
<td>0</td>
<td>0.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>vegetable garden [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>orchard [ha]</td>
<td>0.480</td>
<td>0</td>
<td>1.500</td>
<td>0.400</td>
<td>0.320</td>
<td>0.640</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>plantations [ha]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>unused [ha]</td>
<td>0</td>
<td>1.500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reason for change (f)</td>
<td>12</td>
<td>2,4,7</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Land title (g)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Origin of the land (h)</td>
<td>1</td>
<td>3</td>
<td>1.2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>% per different origin</td>
<td>100</td>
<td>100</td>
<td>50;50</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Remark: see legend at the end of Appendix 05
### Legend Appendices 2 - 5

(a): Ranking group:  
1: very poor  
2: poor  
3: medium  
4: rich  
(see Chapter 2)

(b): Ethnic affiliation:  
A: Lao Loum  
B: Lao Theung

(c): Origin: (basis is origin of the wife because the land in most of the families is given to the daughter and the woman is traditionally the owner of the land)  
1: born in the village or settled before 01/1990  
2: settled after 01/1990

(d): Educational level:  
1: illiterate  
2: 2 years adult program  
3: till 4 years school  
4: 5 and more years  
5: vocational school  
(excluding children less than 6 years)

(e): Main occupation:  
1: farmer  
2: farmer with small business  
3: government official  
4: employee  
5: housewife  
6: business, trader  
7: retired, handicapped

(f): Reason for change  
0: no change  
1: personal reasons, e.g.: financial constraints  
2: tax burden  
3: selling and buying  
4: leasing and renting  
5: donation  
6: land allocation gave an impetus  
7: change in use implemented by land allocation  
8: area retained by land allocation  
9: move of a household after land allocation  
10: loss of area by the fixing of the boundaries of the training and model forest  
11: change in market situation  
12: change in use and transformation of the area

(g): land title  
1: none  
2: temporary  
3: permanent

(h): Origin of the land  
1: donation / inheritance  
2: purchase  
3: free land  
4: lease
Appendix 06

Location of the villages
Map of the study area (based on MS Encarta Weltatlas, 1999; modified)

The geographical co-ordinates are 18° 14' 05" latitude N and 102° 11' 45" longitude E for Napo and 18° 06' 10" latitude N and 102° 15' 40" longitude E for Khokpheun.
Appendix 07

Special characteristics of the surveyed villages
## Characteristics of the villages of Khokpheun and Napo

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Napo</td>
</tr>
<tr>
<td>Population</td>
<td></td>
</tr>
<tr>
<td>Inhabitants [n]</td>
<td>346</td>
</tr>
<tr>
<td>Households [n]</td>
<td>55</td>
</tr>
<tr>
<td>Persons per household [n]</td>
<td></td>
</tr>
<tr>
<td>Min. .. average .. max.</td>
<td>1 .. 6.3 .. 12</td>
</tr>
<tr>
<td>Ethnic groups</td>
<td>Lao Loum and Lao Theung</td>
</tr>
<tr>
<td>Access</td>
<td></td>
</tr>
<tr>
<td>Distance to Vientiane [km]</td>
<td>~ 80</td>
</tr>
<tr>
<td>Distance to main road [km]</td>
<td>10</td>
</tr>
<tr>
<td>Public transport</td>
<td>No</td>
</tr>
<tr>
<td>Access to markets</td>
<td>Difficult; around 10 km to the next local market</td>
</tr>
<tr>
<td>Basic infrastructure</td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>No electricity supply</td>
</tr>
<tr>
<td>Water</td>
<td>Not sufficient water</td>
</tr>
<tr>
<td></td>
<td>available for household and agricultural production</td>
</tr>
<tr>
<td>Social services</td>
<td></td>
</tr>
<tr>
<td>Medical centre</td>
<td>Nurse</td>
</tr>
<tr>
<td>School</td>
<td>Primary school</td>
</tr>
<tr>
<td>Village</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Founded in 1965</td>
</tr>
</tbody>
</table>

(Source: Field survey, 1999 and village documentation)
Appendix 08

Administrative structure of the villages
Administrative structure of the villages

Village leader (mayor)

1. Deputy responsible for economic affairs
   - Village forester
   - Representative of the Land Tax Office
   - Representative for the village security
   - Representative of the "Youth Organisation"
   - Representative of the "Lao Women Union"
   - Representative for educational affairs
   - Representative for cultural affairs

2. Deputy responsible for socio-economic affairs
   - forms the village authority (amnat ganpokrong baan)

   - Head of village sub-unit
   - Household

"Council of Elders" acts as advisor

(Source: Field survey, 1999)
Appendix 09

Agricultural production in the study area - terms and explanations
Appendix 09

Wetland rice can be cultivated as a monoculture over a long period of time without reduction in yield per unit of area. The yield of rice from wetland fields is higher than from uplands. Wetland cultivation is practised by 2 approaches: irrigated and rainfed lowland production. Controlled irrigation of wetland fields offer the possibility to harvest twice a year. This allows a more intensive use of the fields. Due to the lower labour requirements and the quality of the product, the cultivation of wetland rice is preferred in the study area.

Rice under permanent upland cultivation grows in rotation with other crops. Due to high labour requirements and low harvests, shifting cultivation of rice is a form of "transitional" use in the study area. Depending on the suitability of the area and the availability of funds and labour, the area will be transformed into other land use types.

Small fields which are exclusively used for the cultivation of vegetables. Those fields are mainly seasonally established next to the residential building as well as in Khokpheun on the banks of Mekong River.

Land which is exclusively used for grazing animals. (Fallow lands as well as wetland and upland rice fields are additionally used as pasture in the dry sea-son.)

Used for the cultivation of fruits, e.g. mangoes, bananas, citrus fruits.
Appendix 10

Tenure terminology

(BRUCE, 1998)
Appendix 11

Illustrations

(all photographs taken by the author)
Photo 03: Wetland rainfed fields in Napo

Photo 04: Preparation of upland fields by fire clearance in Napo
Photo 05: Insight in the village Napo

Photo 06: Wetland fields used as pasture in the dry season
Photo 07: Irrigated wetland fields and irrigation canal in Khokpheun

Photo 08: Vegetable gardens at the banks of the Mekong river near Khokpheun
Declaration

I, Iris Evelin Funke, hereby declare that this thesis titled: "Analysis of land allocation and implications on land management: A case study of two villages in Sang Thong district, Vientiane municipality, Lao PDR", submitted to the Institute of International Forestry and Forest Products at the Dresden University of Technology, is the result of my own efforts except for the references cited, and has not been submitted in any other Institution.

Tharandt, February 22, 2001