NON TIMBER FOREST PRODUCTS (NTFP) PROJECT

Natural Resource Management

To: The Phnom Penh Post.

Re: The Natural Resources and Livelihood Study

Please find enclosed a copy of our recent report "The Natural Resources and Livelihood Study - Ratanakiri Province, Cambodia", published July 1997.

This paper serves as a feasibility study for the NTFP project, but primarily as an introduction to the people of Ratanakiri and their unique relationship with their environment. Natural resource use and resource conflicts were key themes of the research.

The Khmer report will be completed in a few weeks and copies will be forwarded to you at this time (where applicable).

Further copies are available at the NTFP office in Ratanakiri: 075-974039, or from Jan Gregory, the NTFP administrator in Phnom Penh: c/o JVC office, #35 St. 169, P.O. Box 526, Phnom Penh. Tel: 023-366385 Fax: 023-428298.

If you require any further information about the work of NTFP, do not hesitate to contact us at the above address.

With regards,

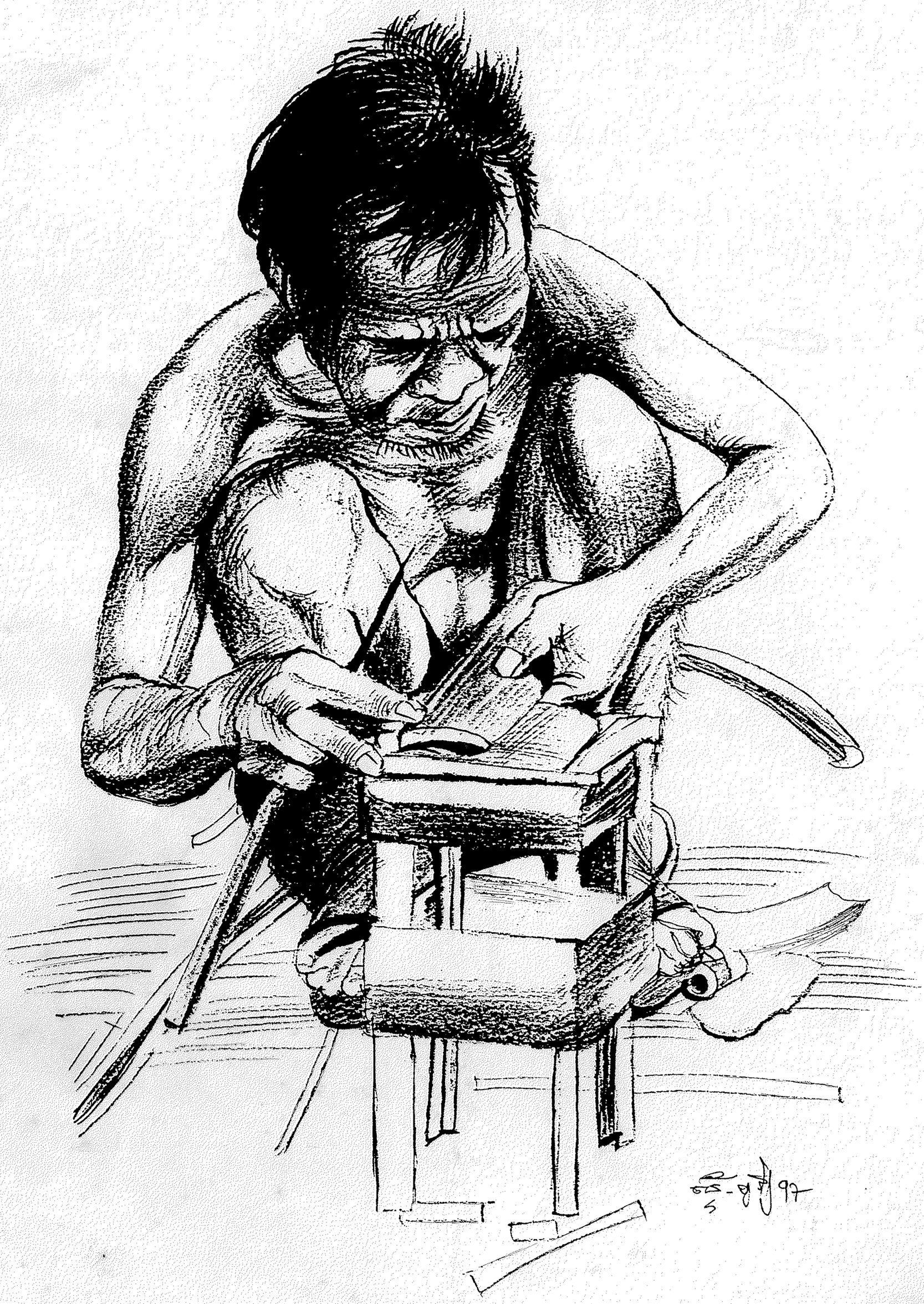
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THE NATURAL RESOURCES AND LIVELIHOOD STUDY

Ratanakiri Province, NE Cambodia



The Non-Timber Forest Products (NTFP) Project
Ratanakiri, Cambodia

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SUMMARY

Although there has been increasing attention called to the deforestation of Cambodia's forests, there has been little discussion of the impact of this trend on the lives of local people.

Ratanakiri Province, like most of North-east Cambodia remains heavily forested and forests play a critical role in meeting the needs of local people. The majority of people in Ratanakiri are Highland people from a number of ethnic groups: Kreung, Tampuen, Kavet, Brao, Jarai, Kachok and Phnong. It is important that the unique relationship between these communities and their natural environment be understood.

Local, national and international investors are increasingly interested in the natural resources of Ratanakiri such as lands, forests, rivers, and gems. People are moving to settle in Ratanakiri from Phnom Penh and other provinces in 'lowland Cambodia'. These outside pressures have a number of impacts on local communities. There is increasing competition for land (and other resources) and evidence suggests that resource conflicts are steadily growing, particularly in the vicinity of the Provincial capital of Ban Lung. Few mechanisms seem to be in place to deal with these disputes.

Discussions concerning deforestation and the importance of forests are usually centred around bio-diversity and watershed issues such as erosion and flooding. Little attention is paid to the collection of non timber forest products by local people. Communities rely on the forests to meet their daily food and housing needs. Common examples include: honey, tubers, forest fruits, fish, rattan, bamboo and medicinal plants.

Research into the relationship between people and their forest environment is crucial for providing information to decision-makers. By the very nature of Ratanakiri, natural resource use will be a key theme of planning activities for development in the Province.

The "Natural Resources and Livelihood Study" explored three key themes - what are the natural resources in the province? How do the local people use these resources? and what are the changing pressures on local resources? Study sites were selected in five districts: Ta Veng (2 communes), O Ya Dav (2), Bo Keo (1), O Chum (3) and Veun Sai (4). Villagers were from the Kreung, Tampuen Kavet, Jarai and Brao ethnic groups.

It is evident that there are a vast number of non timber forest products collected by local people in Ratanakiri.

Over 60 forest vegetables and 21 forest fruits were identified. Vegetables (tubers, bamboo shoots) and fruits (wild bananas) are important for food security, particularly if crop yields are low. They are predominantly used

for household consumption and collection levels appear to be sustainable at present.

Malva nuts are an important product for income generation and can be sold to collectors at prices averaging 2,500 Riel (US$1) per kilo. This economic crop occurs once every 5-7 years and prices rise dramatically over the short season as availability is reduced and middleman competition rises. There does not appear to be any management system and destructive collection methods such as cutting down trees are a threat to the sustainability of this valuable economic resource. Organising marketing and community control of collection methods would ensure that optimum price benefits go to the local people.

Forests play an important role in providing materials for water supply, water storage, animal/fish traps, boats, baskets, cooking equipment, clothing, baskets, coffins, mats and fencing. Rattan and bamboo are extremely important forest products, and as many as 21 out of 27 handicrafts were reported to be made of bamboo in one Kavet village in Veun Sai District.

Highland people traditionally rely on animal sacrifices to heal sickness which they view as being caused by spirits. As a result, they have a limited use for medicinal plants. A number of treatments for common problems such as fever and headaches are in use but most of this knowledge has been passed on from Lao and Khmer people. The study team met with several innovative plant healers of Kreung ethnicity, but the Highland people have no system for passing on this knowledge to younger generations.

Although wild animals are hunted for food, fish plays a more important role in the diet of communities who live near major rivers and streams. Small animals such as rodents and squirrels are an important source of protein for people in upland areas. Forest wildlife are increasingly hunted for sale, and middlemen travel between villages collecting animals such as pangolins. Export demand is growing, especially for making traditional medicines in Vietnam and China. Hunting methods such as traps and crossbows have been used for generations, but the war years of the 1980's

meant that guns were freely available, especially to soldiers and local militias. As a result, animals such as elephants, gaurs, sunbears and tigers have been dramatically reduced in number.

Although fish diversity in the Sesan River (a key tributary of the Mekong) is extremely high, unsustainable collection methods are threatening fish stocks. Explosives fishing, poisoning and modern gears like dragnets are predominantly used by outsiders and most local people continue to use traditional techniques such as bamboo traps. Fish are sold in district and provincial markets and a number of valuable species are exported to Thailand via Phnom Penh.

While paddy cultivation has increased (especially since the Pol Pot era) swidden agriculture remains the most important activity of Highlanders for their subsistence needs. Significant fallow periods when the forest can regenerate are essential for maintaining the soil fertility and sustainability of this system. Although rice is the staple crop, a wide variety of crops is the key to food security. Rice seeds are mixed with vegetables such as sesame and legumes and put into small holes in the ground (untilled soil). Many rice species are evident; 17 species were reported in one Kreung village, and as many as 28 in a Kavet village. Annual crops include legumes, herbs/spices, root crops, gourds and non-food crops like tobacco. As with rice, many species are planted, but the number and range varies from village to village. Perennial crops such as bananas are planted both in villages and in agricultural fields.

Where population density remains low and cultivation is according to the traditional system, swidden agriculture can actually enhance the protection of watersheds, forest cover and biological diversity. However, in communities where traditional land and forest management has broken down, the system becomes destructive. Reasons for this include forced resettlement, market pressures, and the loss of traditional lands by encroachment. Recognising boundaries between communal agricultural lands has been practised for generations and is important for regulating the swidden cycle and ensuring sustainability.

In the past, communal tenure of village agricultural lands and common resource access to forest products allowed that there was little competition for resources amongst Highland communities. With the move to a market economy, competing claims have risen from outsiders to the land and forest resources. These challenges are in the form of investment concessions for logging and commercial agriculture. Immigrants and traders from other provinces can easily
apply for titles to plots which encroach on customary lands, although this is sometimes done in collaboration with local people.

Continued access to lands and forests is the single most important issue which Highlanders are facing. This could undermine their livelihood base and the unique environment of Ratanakiri. Highlanders are disadvantaged because their customary tenure is not recognised legally. There is a lack of clarity concerning application procedures for land title and as yet there are no precedents for legally recognising communal village title to lands. Imposing a system of individual land title could undermine traditional social organisation and culture. Further obstacles are low literacy rates and the remote nature of villages. Precedents for land, water and forest tenure which are appropriate to the existing agricultural systems are needed.

It is hoped that the findings of this study will serve as a useful tool for government, communities, NGO's and investors as they make decisions

concerning natural resource use in Ratanakiri. Decision-makers need to understand the local people's reliance on the forest in order to make informed and responsible decisions.

It is evident that problems of unsustainable resource use in Ratanakiri are two-fold:

1. The increasing use of destructive collection practices by local people and migrant poachers. Examples include the use of guns for hunting, dynamite fishing and the cutting of trees to collect the fruits. The breakdown of the traditional swidden system may cause forest lands to revert to grasslands.

2. The activities of external players such as local, national or international investors.

Throughout the study, villagers revealed that they were aware of the problems created by destructive practices and a number of villagers expressed interest in developing village-level regulations for sustainable resource use. Management systems may be built by dialogue, understanding and agreement between local communities, government, investors and development agencies.

Traditional communities in Ratanakiri need to meet these new challenges by being willing to organise and exchange information beyond their village and ethnic boundaries. Access to information about investors and government development plans is crucial for them to participate in a meaningful way in social and economic

development. Conversely, the government and policy-makers need to be kept informed of local people's livelihood needs through ongoing research. Conflict resolution procedures and dialogue will be needed to integrate local people's needs and aspirations with the objectives of the government in order to achieve economic development and a sustainable environment.

ACKNOWLEDGEMENTS

This research study could not have taken place without the support and co-operation of many people in Ratanakiri and Phnom Penh.

A warm thank you to the many Highlander, Khmer and Lao villagers who took part in our PRA research sessions, especially to those who put us up in their houses and community halls. Thank you for your time, your welcome and your enthusiasm.

Many thanks go to the numerous village and commune leaders who assisted the study team, in particular Mr. Yuon Savan of Hat Pok commune, Veun Sai who provided hospitality and advice. The interest and assistance of the District Heads of Veun Sai, Ta Veng, O Chum and Bo Keo proved invaluable to the Natural Resources and Livelihood study.

The Ratanakiri Provincial Government kindly gave their permission for the research to take place, issued travel papers and organized the provincial departments and local authorities who collaborated with the study. The support of the provincial Governors must be gratefully acknowledged, in particular the First Governor H.E. Kep Chuktema.

The enthusiasm, energy and hard work of the research teams must particularly be noted, including many village representatives and a number of government staff, in particular Mr. Hor Hong of the Ratanakiri Provincial Environment Department who assisted with the Sesan rapid survey.

The Nature Conservation and Protection Department at the Ministry of Environment and the Wildlife Protection Office of the Forestry Department must be acknowledged for their cooperation in providing staff to participate in the rapid survey phase. The Extension Department of the Ministry of Agriculture kindly gave permission for their officer Ms. Uch Sarom to do the gender component of the survey.

Many thanks also go to the independent consultants who organized a number of the studies. A big thank you to Mr. Heng Kim San who took on the troublesome task of logistics and coordination.

Finally, the continued guidance, patience, and financial support of OXFAM (UK&I) and NOVIB must be acknowledged.

The NTFP Project, July 1997

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CONCLUSIONS

Chapter 1
INTRODUCTION TO STUDY

Oxfam (UK&I) and Novib jointly funded a study on **Non-Timber Forest Products** (NTFP's), natural resources and livelihoods in Cambodia from July 1995 until the end of March 1996. This study was preceded by a comprehensive study of NTFP's in Laos, and some preliminary work in Vietnam. The Province of Ratanakiri was chosen as it is strategically placed in the Northeast, bordering both countries. It is one of the few accessible areas in Cambodia with significant forest cover, and for many years the local people have relied heavily on the forest for their daily needs.

RESEARCH OBJECTIVES

Set within the wider context of deforestation, the main objective of the study was to explore ways of improving the quality of life of local communities, whilst promoting the management of the natural environment in a sustainable way. NTFP's refer specifically to subsistence or market goods or resources which are derived from the forest. Some examples of this include building materials, honey, medicinal plants or wild fruits.

A central theme was to identify how interventions focusing on NTFP's could be an opening for promoting community management of natural resources in Ratanakiri Province. A major objective was to identify (1) sites and communities where local management may be possible or already happening, and (2) the forest based and other natural resources which are of importance to their livelihood. The issues, constraints and opportunities for partnership with these communities in protecting and managing remaining forests, fisheries, water resources, and lands were also explored.

METHODOLOGY

The research study spanned three phases:

- Pre-feasibility, July - November 1995
- Feasibility - "Natural Resources and Livelihood" study, December 1995 - March 1996
- Reflection and project planning, April - July 1996

Pre-feasibility Phase - During this phase a co-ordinator worked together with a Cambodian counterpart to identify key issues and sites of interest for a more detailed study. During this time a number of key events and findings shaped the scope of the feasibility study to follow:

Access to resources became a core issue when, in October 1995, a 1.4 million hectare concession covering most of Ratanakiri's central plateau was granted to an Indonesian company for logging and industrial agriculture. Other smaller concessions were also being granted. Access by indigenous people to land and natural resources was being squeezed by land speculation and acquisition of land by lowland immigrants through land titling procedures inaccessible to the ethnic minorities.

The accessibility of local and regional markets was perceived as being a major factor impacting on livelihood sustainability, wildlife and forest products, in addition to contributing to the breakdown of traditional tribal society. Furthermore, it was found that swidden agriculture was by far the most important livelihood activity in the tribal subsistence economy and a form of forest utilisation (using forest fallows to replenish soil fertility) and therefore it would be logical to include it with non-timber forest products in follow-up studies on forest use and management.

From this broader outlook, the "Natural Resources and Livelihood" feasibility study was conceived to encompass land and water based resources, as well as forest resources utilised by ethnic minorities for their subsistence livelihood. In view of the pace at which concessions were being granted and lowland encroachment on customary land was happening it was decided that external and internal threats to sustainability should be a second component of the study. Thus, the consultancy to make a case study of potential effects of concession proposals on local people's livelihood was developed. It was proposed that study sites for the "Natural Resources and Livelihood" component should include areas within the concession zone as well as areas that would be exempt from these threats. Study sites in the Virachey National Park buffer zone were thus chosen as well as important watershed and conservation sites in the central plateau region.

Natural Resources and Livelihood Feasibility Phase - A number of consultants and government staff co-operated with the feasibility phase of research. The specific studies and researchers were:

(1) Customary and legal aspects of land tenure - Masters research done by Rayleen Russel in co-operation with the study co-ordinator, 10 days, November 1995

(2) Fisheries, NTFPs, and livelihoods of the Sesan River: Ian Baird in co-operation with Ratanakiri Provincial Environment Department, 10 days, December 1995

(3) Fisheries of the Srepok River: Nandeesha (Padek) in co-operation with Provincial Forestry/Fisheries Department, 5 days, December 1995

(4) Natural resources and livelihood in O Chum and Ta Veng Districts - a comparison of upland and lowland communities: Dom Taylor-Hunt (IDRC) and Ken Serey Rotta (Ministry of Environment) 26 December - 5 January 1996

(5) Non-timber forest products and ethnobotany of Veun Sai, O Chum and Bo Keo (Lung Khung Commune) Districts: team of three from Ministry of Environment, Nature Conservation and Protection Department; 5 weeks, January-February 1996

(6) Wildlife and livelihoods of Veun Sai, O Chum and Bo Keo Districts: team of two from Wildlife Protection Office, Central Forestry Department; 5 weeks, January - February 1996

(7) Gender issues in natural resources and livelihood, and Handicrafts, Veun Sai, O Chum and Bo Keo Districts; Uch Sarom (Ministry of Agriculture, Extension Department); 5 weeks, January- February 1996

(8) Upland agriculture of Kreung and Tampuen people of O Chum and Bo Keo Districts; Yech Polo (Ministry of Agriculture, Agronomy Department)

(9) Traditional medicine and medicinal plants of Veun Sai, Kon Mum and Lomphat Districts: Pascale Derleth, 2 weeks, March 1996

(10) Project Identification and feasibility study at two sites in Kavet communities of Veun Sai District and lowland Kreung communities of Ta Veng: Ian and Monsiri Baird, and Kuncungnit Tubtim; 1-14 March 1996

(11) Impact of proposed oil palm plantation development on livelihoods of ethnic minorities in O Yadao District - a case study on resource conflict of customary versus commercial interests: Sara Colm, 3 weeks, March 1996

(12) An economic analysis of non-timber forest products in Ratanakiri Province, Cambodia Training for Provincial staff and study co-ordinated by Camille Bann (EEPSEA) with support and co-operation from NR and Livelihood study; 2 weeks, February 1996

Please note that Studies 5, 6 and 7 (NTFP, ethnobotany, wildlife and gender) took place as an inter-disciplinary, interdepartmental team of mostly staff from Government partners, in the following communes and Districts;

O Chum District - La Ak Commune
- Poey (Chan) Commune
- O Chum Commune

Voen Sai District - Voen Sai Commune
- Hat Pok Commune
- Phnom Kok Commune
- Kok Lak Commune

Bo Keo District - Lung Khung Commune

During the study period, a national policy seminar was held in Ban Lung from 25 February to 1 March 1996. This was entitled "Seminar on Sustainable Development for Northeast Cambodia". In accordance with the study plan, the Co-ordinator Gordon Paterson, the Project Assistant Heng Kim San and the Gender Consultant Uch Sarom diverted time to develop participatory case studies at selected villages of Kavet, Kreung and Tampuen ethnicity to be presented by community representatives at the Seminar. The case studies and representatives selected by their communities were as follows:

- "History of resettlement of Kavet People of Kong Nok Village, Veun Sai District"; Mr. Chan

- "History of resettlement and competing land use in Yeak Laom Commune"; Yong Seng, Phnom Village, Ban Lung District (Tampuen).

- "Encroachment of soybean concession on customary land of Kreung people, Tong Krabu Village, O Chum District"; Poey Pao and Gaew Thoey. (Kreung)

Most of the research was conducted during the period when people are back in their villages after their annual harvest. The research teams made contact with villagers through a number of District and Provincial officials who assisted with introductions. A number of research techniques known collectively as Rapid or Participatory Rural Appraisal (RRA or PRA) were used, including semi-structured interviews, seasonal calendars and timelines, focus groups, and discussions with key informants. Mapping focused particularly upon community boundaries and natural resources. The information was later cross-checked at village meetings.

From 16 - 21 March an internal consultation was held in Ban Lung to discuss the interim results of the study and strategize on possible follow-up activities for the implementation phase. The advisors who participated were: Ian and Monsiri Baird (Lao Community Fisheries Project/Canada Fund Lao); Tubtim Kuncungit (IDRC Watershed Programme, Lao PDR); Ms. Eang (TERRA, Lao); Charlie Pahlman (CAA Lao); Sara Colm and Ung Sophea (Human Rights Task Force, Cambodia); Woutje van Soujlekorm (Novib); Kham Teuang (Brao ethnic

leader from Ta Veng district); Gaew Thoey (community representative, Tong Krabu Village); Gordon Paterson (study co-ordinator).

Reflection and Project Planning - The research was completed on 31 March and, based on the results, a proposal was submitted and approved by Oxfam UK&I and Novib for ongoing project implementation in Ratanakiri Province. The period April to July was occupied by reflection and planning for the implementation phase and discussions with relevant Provincial and Central Government agencies as well as humanitarian organisations working in Ratanakiri. Small-scale project activities were initiated between July and November 1996 such as a staff internship/orientation and non formal education planning and training.

PURPOSE OF REPORT

It was the intention of this study to provide an accurate and useful resource for policy and decision-makers. Awareness-raising was a key theme for local and national Government, Donors, NGOs, and the general public both in Cambodia and overseas. It is the hope of the study team that the report will assist local communities in Ratanakiri by providing a wider picture of many livelihood issues. Although literacy in the Province is relatively low, it is hoped that those who are able to access the information will be inspired to share their ideas and initiate dialogues with members of their community.

As this study was initiated as a feasibility for the NTFP project, institutional learning was important and the research findings served as the basis for developing future interventions. Case studies were particularly valuable for illustrating many of the problems local people face. Through co-operation with villagers, community leaders, NGO's and government staff throughout the research, good relationships were built and a number of local contacts were made which will provide a solid foundation for the work of the NTFP project in the future.

FORMAT

The context of the study is outlined in Chapter 2 where the geography, people, culture, and livelihoods of Ratanakiri are introduced.

Chapter 3 explores traditional forest use amongst local communities. What is the value of the forest to ethnic minorities? How do they rely on the forest? Which forest products are collected? Is this relationship sustainable? Is forest use changing? Are NTFP's sold? Are collection methods changing?

Fish resources along the Sesan River are the focus of Chapter 4. The cultural aspects of collection and consumption are reviewed, along with changing attitudes and pressures. Which fish are collected? Are current collection levels sustainable? What is the impact of market growth on fish stocks? Do

conflicts arise between artisan and commercial fisherman? How are disputes over fish resources settled?

The nature of swidden agriculture in Ratanakiri is discussed in Chapter 5. What is the relationship between forest resources and cultivation? How does swidden farming differ from lowland paddy cultivation? What are the staple food crops? What is the seasonal agricultural cycle? Does the crop diversity vary between different ethnic groups? How is land prepared? What are the distinct roles of men and women?

Chapter 6 provides a conclusion to Chapters 2-5 and appraises patterns of natural resources in the highlander communities studied. It evaluates the balance between the local people and their natural environment. Is this balance changing? How? Why? Finally, the issue of land is introduced as a key livelihood issue.

The issues of land claims, rights, sales, and tenure are explored through a number of case studies in Chapter 7. How do customary land agreements differ from those employed by lowlanders? How can land title be acquired? Who has land title? Why is land increasingly sold? Why are there increasing land disputes in the Province? What are the consequences of local market growth? The discussion illustrates how the gap is widening between those who have broadbased knowledge, wealth and power, and those who do not.

Chapter 2
TRADITIONAL LIVELIHOODS

A low population density, a predominance of dense forests, fertile soils and swidden cultivation characterise the highland province of Ratanakiri and much of traditional livelihoods and culture stands in contrast to that of "lowland" Cambodia where paddy rice farming on relatively flat land is more typical.

In addition to the provincial town and commercial centre of Ban Lung, Ratanakiri is comprised of eight districts; O Chum and Bo Keo in the centre, Andong Meas to the East, Ta Veng and Veun Sai to the North, and Kon Mum, Lumphat and O Ya Dav to the South.

The province is divided by two of the most important tributaries of the Mekong; the Sesan and the Srepok rivers. The Sesan, a large lowland river originates in Vietnam and flows westward across Northern Ratanakiri before converging with the Sekong river shortly before it runs into the Mekong. The Srepok river flows from Vietnam across Southern Ratanakiri before converging with the Sesan. The flow of these three rivers represents between 10-20% of the Mekong's total volume and they are therefore very significant in terms of the lower Mekong river basin as a whole.

Until recent years, the province has had a relatively autonomous existence in relation to lowland Cambodia and elsewhere in South East Asia. Yet as the region's timber resources are rapidly depleted, Ratanakiri's vast natural resource base is beginning to attract further attention, both within Cambodia and internationally.

In recognition of this increasing pressure upon Cambodia's natural resources, H.R.H. King Norodom Sihanouk of Cambodia has designated a number of valuable ecological sites as protected areas. One such area is Virachey National Park in northern Ratanakiri, which encompasses a land area from the eastern territory of neighbouring Steung Treng province, up to the Lao PDR and Vietnam borders, and is confined to the east by the Ta Veng - Andong Meas District boundary.

THE PEOPLE OF RATANAKIRI

Ratanakiri is a multi-ethnic province, with the lowland Khmer inhabitants comprising only 15% of the population. Local communities are comprised of various cultural groups including Lao, Chinese, Vietnamese, and the indigenous peoples of the region (Khmer Loeu, or upland Khmer). There are six such tribal groups: the lowland Kachok, Brao and the Kavet; the highland Jarai; and the Kreung and Tampuen who live in both upland and lowland



environments. The languages of the Brao, Kreung and Kavet are similar and have little in common with either Tampuen, Jarai or Kachok.

SWIDDEN LIVELIHOODS

Swidden agriculture (shifting cultivation or slash and burn farming) is the foundation of the indigenous peoples livelihood. The Khmer and Chinese populations predominantly rely upon trading and permanent agriculture, and thus most have settled close to the provincial centre. The Lao are primarily involved in paddy farming and trading in Lomphat District, Veun Sai District and Ban Lung town.

The central feature of swidden agriculture is the 'chamkar'; a field or garden cut from the forest. Chamkars typically surround a village, and plots may be up tc four or five km away. The boundaries of individual gardens are widely recognised between families and by neighbouring villagers. They can frequently be identified by reference to local forests, mountains and streams.

Chamkars are typically used for between one and four years before being abandoned. Old sites can be re-cultivated after a regeneration or fallow period of at least seven to ten years. This interval is determined by the extent of tree regrowth and the absence of weeds. A farmer may have eight or ten different sites in his lifetime, with one plot being between one and four hectares. The life of the chamkar and fallow period depends on the soil type, and the richer red soils of O Chum and Bo Keo may be cultivated for a longer period (typically four years) than the poorer quality white soils of Ta Veng and Veun Sai districts (typically two years). It is of note that some farmers in a number of villages in close proximity to the commercial centre have recently modified their traditional agricultural practices, and produce crops for the market such as fruit harvested from trees located in old chamkar sites.

Very few crops are grown inside the village as it is difficult to protect them from the pigs, chickens and cattle which are usually allowed to roam free. Village houses frequently encircle a long house or community hall, yet in the rainy season most villagers move to live in 'chamkar houses' as this is the busiest work period of the year. Many villages are almost deserted at this time.

It is important to note that the chamkar cannot provide for all the needs of swidden households, and forest resources such as fruits, wildlife, fish, traditional medicines and construction materials are indispensable to those practising swidden cultivation. In this way forests have provided for generations of people in Ratanakiri, particularly in times of food scarcity; they have been likened to the 'supermarkets of the village'. The significance of such non timber forest products for livelihood security and local economies cannot be overstated and this rich diversity of resources will only continue if forests are wisely managed. Although opportunities for timber extraction are

growing, many local communities who depend on NTFP's for their livelihoods do not share this short term view of a forest's value.

BELIEFS, CUSTOMS AND FAMILY TRADITIONS

Although swidden communities in Ratanakiri do share many traditions and customs, variations do exist between ethnic groups and different villages within the same group. The case study below illustrates an example of local beliefs and practices:

The Kavet of Lalay Village, Veun Sai district

Animist traditions influence virtually all important family and village activities. Every stage of field preparation, planting and harvesting is accompanied by specific ceremonies which are designed to please or appease spirits which may otherwise damage crops, or cause illness or bad luck. The making and drinking of rice wine is very important in terms of animist ceremonies For the Kavet, there are at least nine clearly defined ceremonies conducted over one full crop cycle. These require a considerable amount of time, energy and resources such as rice for making wine or domestic animals for sacrificing.

Such traditions are not simply religious activities, but have an important social function as they bring different family and community members together. The most respected elder tells stories about Kavet ancestors and village traditions to younger members of the community. The names of long lists of ancestors are taught to the youth who are urged to respect Kavet traditions and not to marry outside the group. Such gatherings are therefore extremely important for reinforcing traditional ideas and customs. Although illness is one of the main reasons why ceremonies are conducted at the family level, they may be held to try to solve almost any problem which is seen to be spirit induced. It is common for villagers to appeal to the spirits prior to a number of daily activities such as bathing and fishing. There are a number of different spirits which must be appeased in various ways. Kavet spirits and the offerings required include;

- Alak Dak, a water spirit (1 chicken sacrificed & 1 jar of wine drunk)
- Alak Bri, a forest spirit (as above)
- Alak Long, a tree, land and water spirit (tree cut down)
- Alak Ka Lo Phao, an ancestor spirit found in house/dreams
  (before sacrificed 1 buffalo, now 1 large pig and two jars of wine drunk)
- Alak Pra Jrang, a grass & weed spirit (chicken sacrificed & 1 jar of wine)
- Alak Mreul, a swidden field spirit
- Alak Na, a lowland paddy rice spirit

- Alak So Mou, a water and walking path spirit
  (goat, pig or chicken sacrificed & 1 jar of wine drunk)

During ancestor spirit ceremonies which are very significant in terms of protecting crops, spirits are offered pigs, chickens, rice and whisky. Taboo items such as the 'mai hia' bamboo species, 'vai savang' rattan, monkeys or gibbons, the 'pa kang' fish and the 'kapome' lizard are also offered. These items must not be eaten, used or brought into the village. All items except for the wine are ceremoniously buried in the ground.

In Lalay village, four or five men (shaman) can perform these animist ceremonies. They pass on their knowledge to younger members of the community (often close relatives) who are expected to conduct the rituals after they die. No formal studying is involved, only observation.

Chapter 3
FOREST PRODUCTS

This Chapter explores the importance of NTFP's to local people's livelihoods. The analysis focuses on the following categories; food, traditional medicine, construction and handicrafts, and wildlife. These sections are considered in terms of (1) use and values of products, (2) collection and production methods, (3) types of product, (4) seasonality and sources, and (5) availability and sustainability of harvesting. The gender division of labour is also documented for each category. Equally important is to establish the impact of NTFP use on the natural environment; is such collection sustainable? is the forest degraded as a result? These questions must also be considered in the context of increasing market demand in the region. How can communities adapt their activities to these new circumstances in a positive and sustainable way?

This chapter is compiled from information gathered from six parts of the Natural Resources and Livelihood Study:

- Non-Timber Forest Products survey by the Ministry of Environment;
- Survey on Medicinal Plants by a team led by Pascale Derleth, IUCN;
- Wildlife survey by the Wildlife Protection Office, Forestry Department;
- Gender survey by a team led by Uch Sarom;
- Fisheries/NTFP survey & Kavet/Kreung Case study, led by Ian Baird;
- Initial General Feasibility Survey in collaboration with IDRC.

A. FOOD PRODUCTS

USE AND VALUE OF FOREST VEGETABLES

Forest vegetables, leaves and tubers are very important in the diet of local communities, especially those in upland areas. Vegetables and leaves provide important sources of proteins and minerals in a diet that contains little meat. Fish and vegetables provide the main protein and mineral sources in the diets of indigenous people. Tubers, especially yams and *kduoch* (a viney tuber) give villagers an additional source of carbohydrates and are therefore important for food security. Wild tubers were collected particularly during the war years when cultivation was difficult and people were displaced (especially 1970-79) and more recently, in years with rice shortages.

Forest vegetables are usually collected by women and children, often on the way to or from the chamkar or the watering hole. They are collected and transported in *Kaphas*, the local bamboo and rattan back baskets. Forest vegetables are predominantly used for domestic consumption although

certain types are sold by a limited number of villages. Those which are sold include; bamboo shoots, mushrooms, yams and barringtonia leaves. Bamboo shoots are typically sold in bunches of three for between 100-500 riel/kg, whilst other vegetables are sold for 100-200 riel/bundle or package. However, the price does vary with demand and with proximity to the market.

TYPES OF FOREST VEGETABLES

A wide variety of forest vegetables are collected, indeed over 60 forest vegetables were identified during the NTFP study. There is considerable variation between villages and villagers in the number and types of vegetables collected.

	Khmer name:	**English name /description:**
1-	Tompeang	bamboo shoots
2-	Kduoch	viney forest tuber
3-	Pset	mushrooms (13 types)
4-	sleuk kadiev	green leafy vegetable
5-	sleuk smayt	
6-	promouy domray	elephant trunk leaves
7-	damlong	yams (5 types)
8-	sleuk kondol	type of leaf
9-	sleuk reang	barringtonia leaf
10-	trav andoerk	taro
11-	Angkep	

However, the findings of the study indicate that most villagers collect (at least) 7-13 different types of vegetables of which 11 are widely collected:

SEASONALITY AND SOURCES OF FOREST VEGETABLES

Vegetables are mainly collected in the dry season between January and June, although some species can be collected all year round and others have very specific seasons. The main sources are around the village itself, near streams, village or spirit forests, and hill spirit forests. There are generally more varieties in evergreen forests compared to diptherocarp forests.

A number of examples illustrate these variations; bamboo shoots are harvested during and just after the rainy season and can mainly be found near streams and sometimes around villages. The viney tuber, *kduoch*, can be found all year round near the village. Yams are collected from around the village but mainly in the months of March and April. *Kadiev* and barringtonia leaves are picked in February and March and can be found near streams. Mushrooms are found near streams or in spirit forests but different species are harvested at different times. *Pset reusay* (bamboo mushrooms) can be

harvested at any time, whilst *pset day* (earth mushrooms) are collected in December or June, *pset rongie* (cold mushrooms) in the coldest months of December and January, and *pset pchor* (latex mushrooms) in August and September.

AVAILABILITY OF FOREST VEGETABLES

According to the NTFP study the availability of forest vegetables has not declined in recent years and they are readily available. No concerns for sustainability were raised as long as the forests remain primarily intact.

USES AND VALUE OF FOREST FRUIT TREES

Forest fruits play an important role in dietary requirements during the dry season between January and June as most fruits ripen in the months of March, April and May. With the exception of malva nuts, all forest fruits are used only for family consumption. Malva nuts are somewhat unique and will be considered in a separate case study below. Lung Khung Commune, Bo Keo District was the only study site where forest fruits are sold and even there the market demand and prices were low, at 100-200 riel/package. Forest fruits are usually collected by women and children in the same fashion as forest vegetables.

TYPES OF FOREST FRUITS

Most villagers collect between 4-11 types of forest fruits. A total of 21 different fruits were identified in the course of the study, of which 8 types were collected in nearly all villages, these being:

	Khmer name:	**English name Or description:**
1-	svay	Mango (2 types)
2-	sau mao	Wild rambutan
3-	plai phnhiev	
4-	plai komping reach	
5-	plai somrong	Malva nuts
6-	mak prang	Plum
7-	pring	Eugenia
8-	plai poun	Small mango like fruit

It is also significant that 30 forest fruit trees were identified during later research in just two villages; Lalay in Veun Sai, and Choui in Ta Veng. Many more species were found in evergreen forests compared to dipterocarp forests.

SEASONALITY AND SOURCES OF FOREST FRUITS

Like forest vegetables, forest fruits are often collected in the dry season between January and June. The harvesting months seem to vary from commune to commune, although most fruits ripen in April, May and June. They are collected from various locations near villages, around streams or in spirit forests or on spirit hills. Forest fruit trees are found in all the above habitats but collection patterns vary between communes suggesting either local variation in ecology or preferred collection sites.

AVAILABILITY OF FOREST FRUITS

Forest fruits seem to be abundant and availability does not appear to be a problem whilst demand is for family consumption only. A slight decrease in availability was reported in Lung Khung commune, Bo Keo, where fruits are sold but as yet, cutting the trees is not a big problem as with malva nuts:

Malva nuts

Malva nuts are eaten with sugar as a desert, and are used for household consumption. They are sold to traders from the district centres and Ban Lung, and from there they are sold on to Phnom Penh and Vietnam. The sale of Malva nuts is a very significant income generating activity for local communities and they are the highest earning NTFP for a number of villages. Malva nuts are sold for anything between 500-7000 riel/kg depending on the quality, time of season and proximity to the various markets. For example prices in O Chum commune, O Chum, the closest commune to Ban Lung range from 5000-7000 riel/kg, whilst prices in Ta Veng district which is the furthest from traders are only 800-1500 riel/kg. The average price at the height of the season is between 1500-2500 riel/kg.

Malva nut trees are usually found in village forests, hill forests and beside streams, often within the customary village boundaries. They are only found in medium and high altitude forests. Malva nuts are harvested in April and May before the rains when they spoil and cannot be sold.

The harvest is cyclical with a small crop produced in the first two years (approximately 2-3 kg of fruit from each tree) a medium amount in year three, another small harvest in the fourth, fifth and sixth years and a bumper harvest every seven years. This crop is extremely important for income generation when 1 tree may yield up to 100 kg of nuts in a bumper year. In this way a family can earn up to (or over) US$ 100 in one season, although the average family collection in Kanchhoeun village, Poey commune, O Chum was between 5-15 kg. The income from malva nut sales is frequently used for

buying household items such as cooking pots, clothing, MSG, mats and other items such as medicine, livestock and tobacco. It was even reported that one family earned enough from one season to buy a motor bike.

Traditionally, malva nuts are collected after they have fallen to the ground or the fruit is picked by climbing the tree. Malva nuts are collected by families and this approach to harvesting has been sustainable for a long time. As the demand and price for malva nuts has rapidly increased over the last 5-10 years, more and more villagers are harvesting by cutting the trees down so that all the fruit can be gathered at one time. This is so that others can not collect them as there are no traditional ownership mechanisms. The men cut the trees and the women collect the fruits.

The sustainability of harvesting practices is an interesting debate as the abundance of malva nut trees, saplings and nuts in bumper years is extremely high in many areas. The traditional harvesting techniques would appear to be sustainable and in some places during the bumper year, no matter how intensely the ground fall harvest is collected it would be impossible to collect them all. In some areas villagers believe that there are so many malva trees that even when nuts are harvested by cutting trees they will never have to worry about them running out. In other areas, pressure on the trees continues to grow.

Individual or communal ownership and management of malva trees should be developed to ensure equitable access, thus thwarting the need to cut trees in the rush to harvest a particular tree. However, without strong community agreement/support this could prove difficult to monitor.

This change in harvesting methods could have more serious impacts on the general sustainability of forest use. This was highlighted in the findings from Choui village, Ta Veng Leu commune, Ta Veng. The local people used to wait for the nuts to drop to the earth before collecting them as they feared the spirits that protected the malva nut trees. However, last year they cut the trees for the first time as their belief in the power of spirits has decreased somewhat. This undermining of traditional beliefs represents a serious problem if the customary practices that are beneficial to forest and natural resource management and protection cannot be maintained in some way. The breakdown of customary forest protection practices can only be seen as detrimental to the future prospects of both forest communities and the forest.

B. TRADITIONAL MEDICINE

The Highlander, Lao and Khmer groups of Ratanakiri utilise a mix of traditional and 'modern' medicines to treat both real and perceived illnesses. Although western drugs have only been introduced recently, they are rapidly becoming more popular. This is particularly true of communities located close to district markets such as Ban Fang in Veun Sai.

A rapid survey of traditional medicine in Ratanakiri was carried out between 4-18 March 1996 in the districts of Veun Sai, Kon Mum and Lumphat. This research was co-ordinated by Pascale Derleth of IUCN Phnom Penh, and the team consisted of; Toch Nimith, Kham Sulott, and Chhea Son. The central objectives of the study were to collect information on local uses of plant resources, collect samples, and characterise the relationship between villagers and their environment in order to determine whether this link has changed in the last 20 years. Discussions during the pre-feasibility study, the Sesan River study, and the Ministry of Environment NTFP survey also supplement this research.

Preliminary investigations were carried out in order to identify healers in Ratanakiri, and further inquiries into their locations identified Veun Sai, Kon Mum and Lumphat as study sites. An informal approach was adopted, and open-ended and semi-structured interviews of at least two hours duration was the key research tool. Wherever possible, the team stayed at the healer's house to continue discussions throughout the day, and accompany him about the village locality taking plant samples. Ka Lahn and O Lalay were the key study sites in Veun Sai, and those in Kon Mum District were Sre Ang Kroung and along the Srepok River. Most of the 75 plant species collected were found in dry dipterocarp forests where the research was primarily conducted, although others were from degraded mixed deciduous and semi-evergreen forests.

TRADITIONAL MEDICINE IN HIGHLAND COMMUNITIES

Highlanders rely predominantly upon animist practices and animal sacrifices for curing illnesses, and symptoms are interpreted in a radically different way than the Khmer, the Lao, the Chinese or the Western way. The offering of a buffalo is believed to be more effective than a chicken or a pig. Although most indigenous villages have traditional healers who can cure light ailments such as headaches, fever, snake bites, and stomach aches; most of this knowledge has been passed on to them by the Khmer and the Lao. The Sesan river study suggested that few healers were familiar with more than a few medicinal plants and that this knowledge appears to be restricted to the healers except for the most common or valuable ones. If villagers have a need for traditional medicine, they typically buy it from the Lao. The few treatments which are prepared and administered by Highlanders are generally not for sale, although

three exceptions were recorded: Chinese Herb root is sold in four communes to traders from Ban Lung for 5000-7000 Riel/kg (Poey and La Ak in O Chum, and Hat Pok and Veun Sai in Veun Sai). Tinospora runpii and tumeric vine were also sold by villagers in La Ak for 500 and 800 Riel/kg respectively.

TRADITIONAL MEDICINE IN KHMER AND LAO COMMUNITIES

In contrast to highlander groups, the Khmer and Lao have well established traditions of plant and animal medicines. This reliance on locally available treatments is greatest in more remote villages. The traditional healers (Kru or teacher) are very busy with diagnosis, plant collection, and trading. In contrast to most Highlander healers who rarely treat patients outside of their extended family, one Lao healer reported that he treats an average of 6 people per day; this translates to 180 patients per month, and 2160 on an annual basis. Another stated he meets with 3 patients every day; which is 90 per month and 1080 per year. A Khmer healer treats 10 per month and sells 300 packets of plants to the market, which is approximately 3600 treatments per year.

There are a number of approaches to distribution; (1) collect and administer to the patient on demand, (2) collect one or two times per month to sell to Ban Lung market or for patients, (3) collect daily for Ban Lung market or for door to door sales and (4) encourage patients or relatives to collect the necessary ingredients. Although most Lao healers do not charge for treatment (many patients bring offerings such as tobacco or small candles), the income generation aspect of traditional medicine must also not be overlooked. One Lao healer interviewed during the study charges 500-2000 riel per patient and he treats 2160 people every year. In this context he can make over $400 each year. At present there are no intermediaries in this medicine trade so the income goes directly to the healers themselves. It is unknown if this will be the case in the future as (1) the number of merchants are increasing, (2) they currently travel further afield to acquire goods, and (3) villages are becoming increasingly integrated with the market.

Most Lao villages have one or more practitioners and there are a number of Chinese men in Veun Sai with considerable knowledge of traditional medicine. All the healers interviewed stayed in Ratanakiri during the Khmer Rouge regime when they were assigned to treat other villagers. They did not have to work the paddies as their families did. It is often thought that 'western' medicines were completely unavailable during this time but in fact a number of drugs were regularly administered in Ratanakiri at this time, such as malaria prophylactics in Bo Keo and Lumphat. All the healers interviewed knew how to cure common complaints such as fever, diahorrea, headaches, stomach aches, children's diseases and birthing and post natal problems. They also have the ability to mend broken limbs. They diagnose by personal experience and interviewing patients, usually without touching them. They treat the symptoms by trying as many drugs as necessary until the patient

recovers. The Kru view disease as being caused particularly by spirits, but also by dust, dry weather, bad food (not enough or spoiled), pollution, prostitutes or the forest. The kru asserted that they could chase away these bad spirits and they use a combination of incantation, prayer and ritual ceremonies depending on the ailment.

The research suggested that 600-800 plants are used in traditional medicine in Ratanakiri although many Lao healers would argue that all plants have medicinal value if you know how to use them. They are primarily used to treat a number of common ailments, and the study identified plants with qualities for post-birth diseases (12), diarrhea (7), fever (6), skin complaints (4), colds (4) and malaria (3). A particular strength of many remedies is their vitamin content as vitamin deficiency is widespread and the cause of many complaints.

SOURCES AND SEASONALITY OF TRADITIONAL MEDICINE

56% of reported medicines in this sample were derived from trees, 30% from shrubs, 10% from herbs and 4% from vines. Of the treatments described, 31 were bark-based, 29 root-based, 11 leaf-based, 3 herb-based, 6 from heartwood, 5 from all parts of the plant, 5 from the flower, 4 from the stem, and 3 from the fruit. The plants are harvested from many forest environments, both primary and degraded. In addition, paddy fields, riversides and chamkars have an abundance of medicinal plants. Many also occur as weeds around villages. Collection times vary; two of the healers collect on a special day at a certain time. The others collect at any time. Most plants are available throughout the year and healers collect without interruption except in the busy farming times. Dry season is especially good for collecting roots. The healers interviewed stated that they pray to the spirits before collecting and they collect in a way that does not harm the plant. Some plants are used fresh and others such as wood, roots and animal products are stored for a number of months or years.

AVAILABILITY OF TRADITIONAL MEDICINE

There appears to be little pressure on plant populations due to collection as the supply is far greater than the number of collectors and the regrowth rate is often quick. Deforestation represents the main threat to the supply of medicinal materials. Traditional healers in Lumphat stated that there were plenty of trees in 1973 and that many have disappeared due to expanding paddy and swidden agriculture. Although the species composition of forests is similar, the trees are now more scattered. It therefore takes more time to collect as healers must travel longer distances to find certain species. A further threat to the survival of local medicine is the lack of young successors willing to learn about traditional practices. This valuable knowledge must be recorded before it is lost.

C. HANDICRAFTS AND CONSTRUCTION

The basis of indigenous livelihoods are subsistence and self-sufficiency. Fundamental to this is the capacity to produce handicrafts and to construct shelters and stores from local materials. The primary source of raw materials in Ratanakiri is the forest, and almost everything necessary for daily life can be made from plants and trees. The vast majority of products can be made from just a few species, the main ones being rattan and bamboo.

Rattan

Rattan is collected from the forest by families for their own use, it is a multi-use forest product which is primarily used for construction and making kaphas (back baskets). Rattan is used for making rope for both handicraft products (eg the straps for kaphas) and making ties for house building as nails are not used.

At least 8 types of rattan are available in Ratanakiri and these vary in diameter, length and habitat/source. Rattan can be harvested all year round and is typically located near to streams and on hills. Villagers typically have to travel between 5-10 km from their village to collect rattan, depending on the species and the location of the village. In Kancheung village, Poey commune, each family will collect about three hundred stems a year, a stem being anything from 5-15 m in length.

Rattan is readily available in all the communes studied and this can be attributed to the fact that village demand is low and there is little market demand. Issues of sustainability will only become apparent for many species if the market demand increases substantially. However, a number of types grow very slowley and could easily be over exploited if commercially harvested. At present, it would appear that no harvest management system exists other than that villagers only collect from accessible forests. Considering the abundance of rattan and it's multiple uses, it may well provide a good opportunity for developing a sustainable forest product micro-enterprise based on community management and marketing. The profit margins may not be as high as from malva nuts but it is another forest product that already has established markets in Phnom Penh and Vietnam.

Bamboo

Like rattan, bamboo is a muti-use forest product that is essential to the livelihoods of the people of Ratanakiri. The main uses of bamboo are in house and fence construction and for making kaphas, other baskets and fishing traps. This is similar to the uses of rattan but the two products are used for different parts of the construction process. Bamboo is often the principle material for house construction and is also used for roofing, flooring and walls. Bamboo fencing is used in villages to protect vegetable and fruit tree plots from livestock. This is also the case around sacred banana groves. Furthermore, it is used for making livestock pens and entrances to chamkar sites/ houses.

Bamboo is usually for family use only; there is insufficient demand for it to be sold widely. This is not the case in villages around the provincial centre of Ban Lung where the pressure on bamboo resources is very high. The market price for bamboo in Ban Lung is 300 riel/trunk. This is also the case for the Kavet of Veun Sai who derive much of their income from selling bamboo.

Over twenty different types of bamboo were reported in the study, although it is unclear whether there are that many species, as names may differ from place to place. Most villages used between 3-5 types of bamboo, although the villages in Poey commune identified 14 different types of bamboo. Of the bamboo species recorded, most are used for making kaphas, whilst half of them are used for constructing fences, flooring and rice granaries, and only a couple are used for walls, roofing, and fish and animal traps.

Bamboo is primarily collected from around the village and from other sources such as by streams and in forests. For example, villagers in Kancheung village, Poey commune, collect bamboo from five different streams. Bamboo is typically cut in 6-10 m long sections. It can be collected at any time of year, although it is mainly collected after the rice harvest which represents the main time for house construction and the production of handicrafts.

The Kavet people of Voen Sai are well known for using bamboo as bellows for forging the blades of knives. The joint between the roots and the stem also makes a very good curved handle for the shoulder axe. Bamboo is also used for constructing rice granaries. Some Kavet still use bamboo for cooking, storing and carrying cooked rice, especially when they travel far from home on fishing and bamboo/NTFP collection trips (rice is cooked by placing a bamboo container in hot coals.) However, most villagers now use metal pots for cooking brought from the market.

One particular species, 'pa-o' (from the northern mountains towards the Lao

border) is the basis of the majority of Kavet handicrafts and house construction. Of 27 handicrafts reported in Lalay village, 21 are made with this material. It is therefore both functionally and culturally important to Kavet communities who make a number of trips each year to the pa-o bamboo forests. By tying 30-40 pieces together they construct small rafts which they float down O Lalay stream, back to their villages for household use and for sale to the Lao in Veun Sai District centre. Each piece sells for 3-400 riel and this serves as an important income generating activity during the dry season (the current is too strong for the rafts at other times).

It is notable that in the communes covered by this study, bamboo was plentiful and there was no reported degradation of bamboo habitats. The demand for family and village use is sustainable and it is rarely sold. As discussed above, this is not the case in villages close to Ban Lung or for the Kavet, where demand for bamboo is high and availability decreasing. Like rattan, bamboo offers potential for starting sustainable community based management and micro-enterprises.

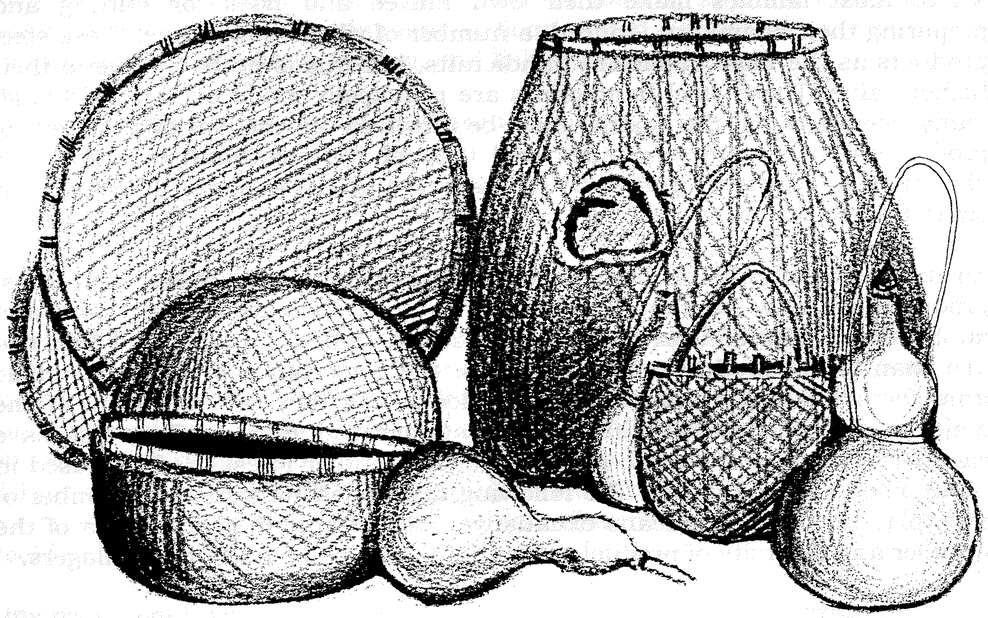
In addition to forest handicrafts, certain key products are traditionally made from steel, including: knives, hoes, swords and chisels. The knowledge and skills required for making such products is still evident in many of the forest communities studied. The Kavet are renowned for their blacksmithing skills where most families make their own knives and hoes for cutting and preparing their chamkars. Indeed, a number of villagers identified these steel products as the most important handicrafts, but this is probably due to their higher value. These steel handicrafts are principally made by men, although many members of the family may be involved in the various stages of production. Axes are sometimes sold to local Lao communities. Steel has always been acquired from outside traders and nowadays it is bought as scrap from local markets.

An increasing number of household products traditionally made from forest products are now purchased from the market (such as cooking pots and implements). These metal products are viewed as better quality and easier to use than forest products. Nevertheless, the importance of products made from forest materials must not be overlooked as they are the basis of the majority of handicrafts and all housing, storage and fencing. They also have significant social and culture importance, as do other forest products used in ceremonies and sacrifices. The following discussion introduces a number of examples but is by no means exhaustive. It attempts to give an idea of the number and diversity of products essential to the life of indigenous villagers.

BASKETS

The most well known of local handicrafts in Ratanakiri are baskets. The most popular being a basket with straps for carrying on the back called a *Kapah*. They come in different sizes, and are the principle container for carrying produce, small tools and NTFP's. They also represent an important source of income for some villagers. The price of a basket varies from 3000-5000 riel in the villages, but they are sold to tourists for anything up to 25,000 riel in Ban Lung. Kapahs are made from woven bamboo or a cane species called *ruun*, with carrying straps made from rattan strips. The baskets usually have red and black patterns woven into them, the black staining coming from the resin of the shorea (*pchukk)* tree or from battery acid. Kapahs are usually made in the evenings and one basket takes about three evenings to make. They are made by both men and women at any time of year (depending on the village and ethnic group).

Other baskets include flat baskets, rice steaming baskets (*smuk bai in Khmer*), and various fishing baskets. All of these are woven from bamboo and the most common are the flat baskets which are used for storing agricultural, forest and fish products, and for sorting rice and seeds.



GOURDS

Gourds (*khlok in Khmer*) are another handicraft characteristic of the ethnic minorities in Ratanakiri. They are the principle container used for the storage and transportation of water, as well as for seeds. They are for family use or for exchange, (3-4 gourds for 1 chicken). They are grown in the chamkar and then converted into containers. A hole is drilled into the flesh of a gourd from the top almost to the bottom, then it is soaked in water for up to 3 months before the innards fall out. It is dried in the sun before being rinsed out several times. For decoration the gourds are sometimes carved before being soaked, or stained black by roasting in the fire. At least four types of gourds are grown.

TRADITIONAL CLOTHING

Traditionally, women wear sarongs (*samput*) and men wear loincloths (*pung*), both of which are made from cotton grown in the chamkar. The cotton is sown by throwing the seeds into the wind and trusting in the spirits. The cotton is spun and woven using locally made bamboo implements. The equipment for spinning is made from the *thnung (in Khmer)* tree. In addition to *samput* and *pung*, blankets are also made. These garments are typically tri-coloured, with bands of natural off-white, red and indigo/black. The black dye comes from locally cultivated indigo, which needs to be soaked in water until it smells bad at which time the cotton is added to the water along with any bitter substance to make the colour fast. Traditionally, the red dye comes from the bark of the *katong* tree, which is then boiled with the cotton in water. *Katong* dye is poor quality and usually partially washes out after two or three washes. As a result, chemical dyes from Thailand are increasingly being used. These can be bought in Ban Lung, and the availability of new dyes has also lead to the introduction of more and brighter colours, especially for developing handicrafts for sale to tourists.

A Samput in traditional colours can be sold for US$ 13 in Ban Lung, with the price increasing with the number of colours used. Each samput takes 15 days to weave full-time, however, they normally take 2 months to 1 year to make (part time). The older women do most of the weaving. Most male villagers now wear shorts or trousers and a shirt bought from the market. Women are also increasingly wearing clothes from the market such as bras, shirts and Khmer mass produced sarongs. The future of traditional clothing and weaving seems uncertain as few young people are learning the skill from their parents. The Kreung have more of a weaving tradition than the Brao or Kavet.



MATS AND OTHER HOUSEHOLD CRAFTS

Mats woven from pandanus odoratissmus (*rom cheak in Khmer*) leaves are made by women or men depending on the ethnic group. They are for household use and for sale; prices vary from 1500 riel to 5000 riel per mat depending on proximity to the market. These fast-growing leaves are readily available close to streams and ponds. They are harvested between December and May as after this time there is insufficient sun to dry the leaves.

Numerous other household items such as brooms, trunks, and pestle and mortars are made from forest materials. Brooms are made from pampas grass (*dam om boas in Khmer*) and bound with rattan and can be bought for 500 riel in Ban Lung. Storage trunks for household use are made by women from a combination of *rom cheak* leaves, bamboo and rattan. Made by men, pestle and mortars are used to hull rice and pound condiments (such as chilli). Mortars are carved from tree trunks (*dam popel in Khmer*) and the 1.5m high pestles can be used whilst standing up.

HUNTING, FISHING AND AGRICULTURAL IMPLEMENTS

A large number of agricultural implements, hunting traps and weapons, and fishing traps and tackle are made from forest products. Made by men, most are constructed from rattan, bamboo, shorea, and *thnung* tree. Shorea is useful for agricultural implements such as ploughs, rakes, whilst *thnung* is used for much of the fishing tackle. Hunting and fishing traps are made from bamboo and rattan and can be of considerable size and complexity. Traditional hunting weapons such as crossbows with poison arrows and fishing gear are increasingly being replaced by factory made products such as AK 47s and Nylon nets (see Wildlife section and Fisheries chapter below). Traditional gears are however still used and the skills to produce and use them is still very much alive. Such traditional practices have a lesser impact on wildlife populations and may well be important in developing sustainable management practices for fisheries and wildlife in Ratanakiri.

HOUSING AND FENCING

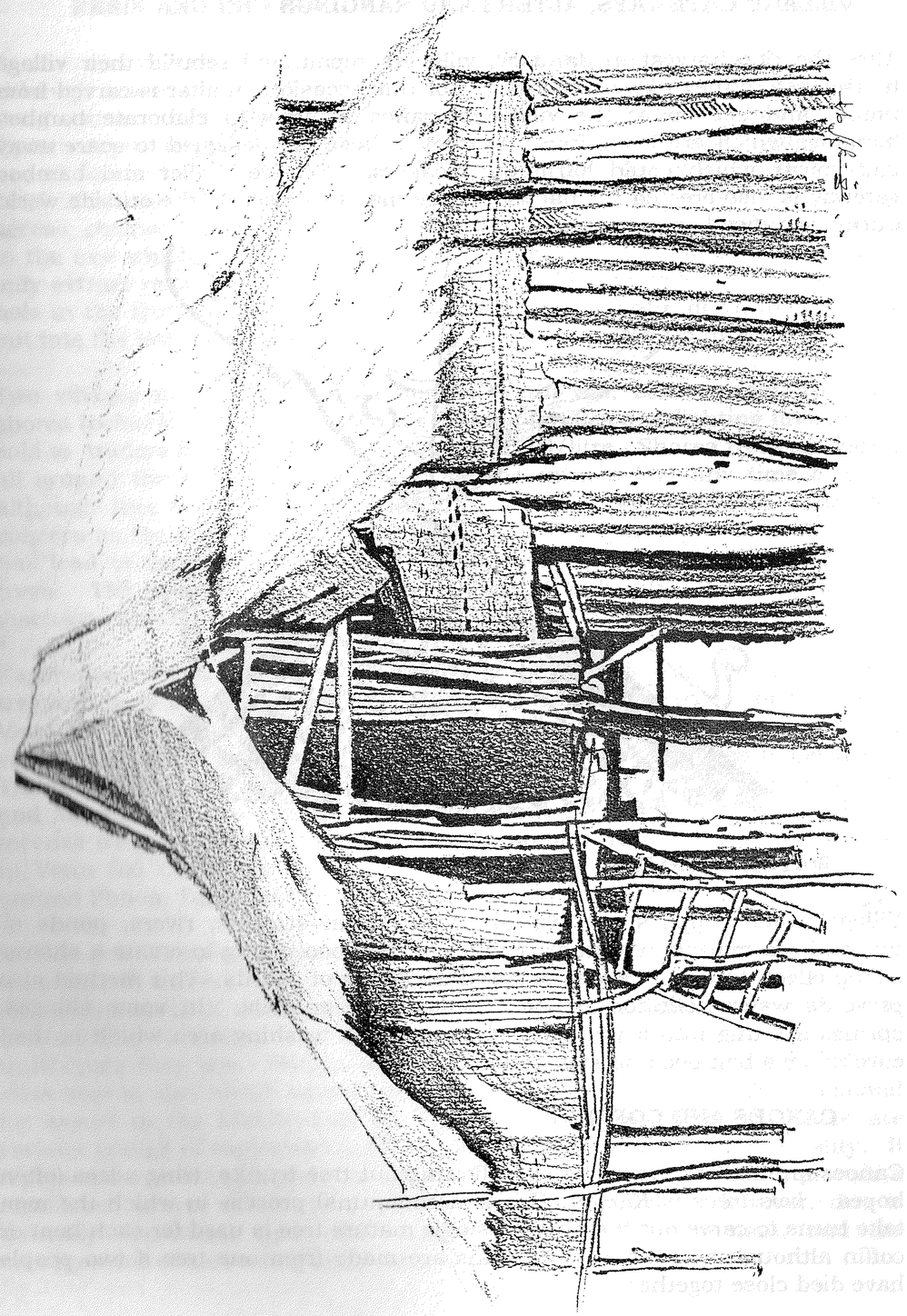
The Lao, Khmer and Chinese of Ratanakiri typically build their houses from hardwood with corrugated iron or clay tiles (if they can afford to) for roofing, As throughout the rest of Cambodia. Indigenous communities principally use bamboo and rattan, with small timbers for the corner posts. House construction does vary from tribal group to tribal group, from village to village and indeed within villages. The materials used are outlined below.

	Part of house	***Khmer name***	**English name or Description**	**Notes**
1-	Roof	*sabeuv* *khanma* *reu sey*	imperata grass leaves bamboo	Women weave
2-	Floor	*srolaw* *churtiel* *koki* *reu sey*	logerstroemia dipto. alatus hopea bamboo	Wood Wood Wood
3-	wall	*srolaw* *churtiel* *khanmaa* *reu sey*	logerstroemia dipto. alatus leaves bamboo	Wood Wood Women weave
4-	house posts	*pchukk*	shorea	
5-	fastenings & ties	*pdao*	rattan	

Men are responsible for cutting the timber for house building, and women for weaving the *khanma* leaves for the roof and walls. Bamboo and rattan are collected as a family and all members of the household are responsible for building houses. Typically one family will live in a one roomed house, although small houses are sometimes constructed nearby to serve as bedrooms for teenage girls or boys especially in upland Kreung villages. Recently married couples often live in the house of the wife's parents until they are ready to establish their own household, depending whether the ethnic group is matrilineal or bilineal. Dwellings are usually arranged in a rough circle with the village long house/ceremony house in the centre (using the same construction methods) and houses are often grouped in extended family or chamkar units (this applies mainly to upland Kreung and Tampuen villages). The small bedroom houses often have single pitched roofs and are similar in construction to rice granaries. Chamkar houses are either single or grouped in small hamlets.

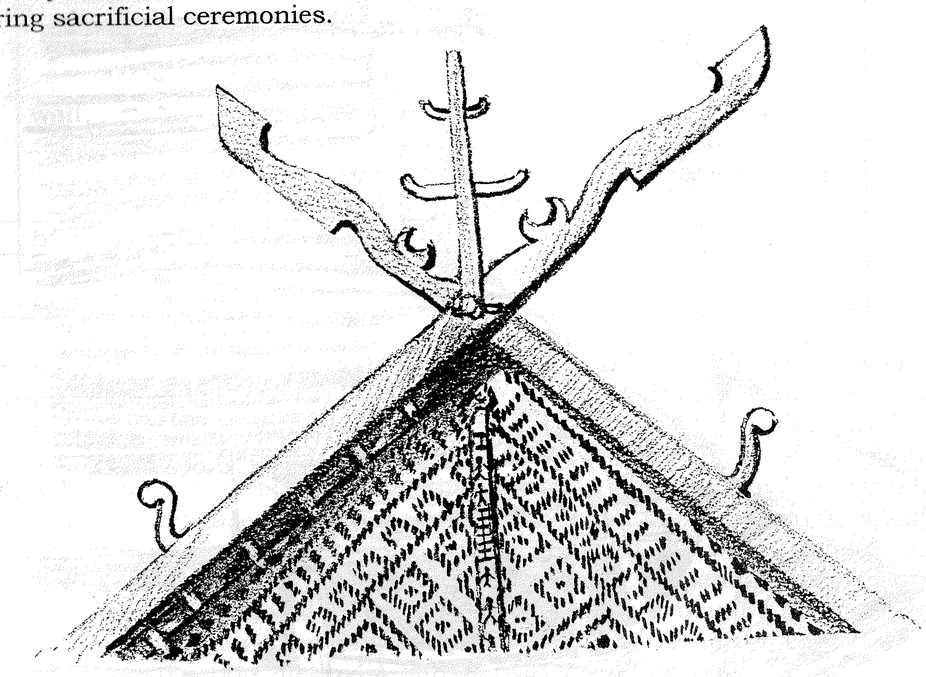
Fencing plays an important role in both village and chamkar life for local communities. In the village it is used to keep free grazing livestock away from household vegetable plots, fruit tree nurseries, and the sacred banana groves (of upland Kreung people). In the chamkar, fences mark the entrance to family plots. They are also used in making fishing fence traps across streams. They are made by weaving split bamboo strips horizontally through numerous vertical sections. Bamboo gateways are made using timber posts with holes bored into them at 30cm vertical intervals that bamboo sections can slide in and out of.

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VILLAGE GATEWAYS, ALTERS AND HANGINGS

After the rice harvest in January, villagers repair and rebuild their village houses before they make a sacrifice. For this occasion an altar is carved from timber and set up at the village entrance along with elaborate bamboo hangings which are hung from the trees. These are designed to scare away bad spirits which could harm the villagers. A large timber and bamboo gateway is also erected so that the village may be closed to the outside world during sacrificial ceremonies.



WATER SUPPLIES

Village water supplies are typically taken from streams, rivers, ponds or tapped from mountain springs using large bamboo piping to create a shower or tap effect, to facilitate washing and the filling of gourds. This method also prevents water pollution by both people and animals. In some villages, springs are dug into a well or pool shape for a washing area which is then covered by a bamboo and rattan shelter.

CANOES AND COFFINS

Canoes and coffins are made by hollowing out tree trunks using adzes (often hopea - *koki trees in Khmer*). This is a communal process in which the men take turns to carve out the wood. A single mature tree is used for each boat or coffin although sometimes two coffins are made from one tree if two people have died close together.

RESIN AND INCENSE

Resins are collected commercially by only a few villages in the survey, although many use small amounts for household torches. The Brao of Ta Veng extract resin from dipterocarpus alatus (*chuitiel in Khmer*) and dipterocarpus obtusifalius (*tbeng in Khmer*) trees for caulking boats and for use as fuel in lamps. These lamps are for household use and can be sold for 1000-2000 riel each. Unlike other forest products which have communal access, *chuitiel* trees have individual user rights; the first user gets sole rights to the tree which can then be passed down through the family. Others can only extract resin if they ask permission first. This is collected by cutting a hole in the trunk and lighting a fire; this draws the resin down and it drips out into the hollow where it can be scraped out or soaked up by kapok fibre.

Two villages in Phnom Kork Commune, Veun Sai, collect resin from the shorea (*pchukk*) tree. This is used for making torches and lighting fires and is sold to traders from Veun Sai town for 1500 riel/litre. Shorea trees are found all around the village and the resin can be extracted at any time of year, although this is easier in dry season. However, there is some cause for concern as the number of trees is decreasing. Growing demand for the resin has lead to increased extraction which, if not skilfully done soon kills the trees. The resin is also used for staining the bamboo for *kaphas*, as discussed above.

Eaglewood incense *(Kleum chan soor in Khmer)* is made from the heart of the tree and is collected in three villages, one in each of the three communes in Veun Sai district. In Phnom Kork Commune, it is collected for household and village use for it's good smell and for *areak* (spirit) ceremonies respectively. The trees are found around Phnom Kchong and are harvested in February and March. Villagers expressed concern about the decreasing availability of incense trees as a result of increased harvesting in recent years. The village in Veun Sai Commune only collected eaglewood for family use from trees around Phnom Tarcheng.

In Hat Pok Commune, eaglewood is collected from Phnom Krola Puos and then sold to traders from Stung Treng. Vietnamese people also come to the mountains north of the Sesan river (Ta Veng and Veun Sai) to harvest incense but nothing is known of the quantity that they harvest, and little of the techniques they use. Saigon is an important international market. *Kleum chan soor* is also highly valued on the world market and is in great demand for export to the Middle East and to a lesser extent, Europe. There are various grades of eaglewood and the price is determined by their quality. It represents one of the highest value NTFP's in Ratanakiri, and could provide a significant source of income generation for local people. However, this is critically dependant upon the number of trees which remain, and the management of harvesting and marketing.

D. WILDLIFE

USES AND VALUES OF WILDLIFE

Research concerning the uses and values, hunting methods, types, seasonality, sources, availability and sustainability of wildlife was carried out in four districts, namely; Hat Pok, Veun Sai, Phnom Kork and Kok Lak in Veun Sai District, Lung Khung in Bo Keo, and Poey, O Chum and La Ak in O Chum District. The information for this section is drawn from the Wildlife Protection Office study, the Pre-feasibility study, and the Sesan rapid survey.

Wildlife is hunted for food and is a relatively important source of protein in the North East. However, it is important to note that vegetables are a central element of the Highlanders' diet, and unlike the Lao and Khmer, much of their food is served without meat or fish. Wildlife is therefore of less dietary importance than may be expected. As a result of their strong fishing tradition, the Lao rely more on fish for protein and for income than any other form of wildlife. The demand for wildlife within Lao communities is therefore determined by the level of fish stocks locally, although this relationship is rarely considered by wildlife researchers.

Hunting for sale and export has expanded since 1979. Species such as pangolin and monitor lizard are sold to NTFP traders, and it was reported that hunting activities have grown rapidly in recent years as many more merchants now travel to villages and offer good prices. This is particularly true of the last two or three years in Bo Keo District, with it's proximity to, and good access to Vietnam. Exports from Veun Sai are primarily to Phnom Penh and Vietnam, and pangolin, tortoise, python, monitor lizards and water lizards are the prevailing species exported, and to a lesser extent, baby gibbons and larger mammals.

A significant proportion of export demand is for traditional medicine, including: tiger and boar teeth (which are considered to be magic); peacock, python and bear gallbladders; tortoise shells; gaur and banteng horns and elephant tusks. Porcupines are sought after for medicine during pregnancy. Furthermore, small barking deer and large deer horns are desired as trophies.

HUNTING METHODS

A number of traditional hunting methods have been developed by the Highlanders of Ratanakiri, although guns have the most impact throughout the Province.

Large and small crossbows were traditionally used by Highlanders, and the arrows may be dipped in poisons which are derived from many sources,

including snake heads. These are apparently not very strong, and a hunter may still have to stalk a large animal such as a deer for as long as three days after shooting it. As a result, large animals are rarely hunted with this method, and it is notable that many villages no longer know how to make the poisons. Eating raw crabs is a local remedy for curing those accidently injured by a poison-tipped arrow. Crossbows may be triggered by trip vines across paths whereby the height is adjusted according to the size of the animal targeted. Although less common now, crossbows remain an important hunting technique.

Deep pits are dug and sharp bamboo spikes placed at the bottom. These are sometimes constructed in the paths of large animals or inside agricultural fences to kill wild boar who try to feed on the rice. Hoisting a log or vine over a wild animal path with a tripline is also effective for catching a large number of species (large or small). The log may be up to seven metres long and 30-40 cm in diameter, thereby crushing the animals underneath it. Smaller ones may also be rigged up for lesser animals.

It is probable that many such traps are also used by the Lao and Khmer. The Lao traditionally encircled areas with larger game in large groups and collectively caught them in hand-held nets after making loud noises to chase them into the nets. The predominant hunting techniques in most districts are currently crossbows, dogs and guns.

During the Khmer Rouge years and the early 1980's, many local people gained access to high-powered rifles and semi-automatic guns, either as soldiers or from the military for self-defence. A direct consequence of this has been a rise in wildlife hunting. As the security situation has become more stable in northern Ratanakiri since the elections, weapons and bullets are more expensive and increasingly difficult to find; for example, the price of a bullet has risen from 100 to 500 riels in Veun Sai District. This has reduced hunting locally.

A recent government initiative is proving somewhat effective for tackling this issue; a weapons buy-back scheme was introduced in 1995. 50 kg. of rice was offered for an AK 47 gun, and 25 kg. for semi-automatics. These weapons can also be sold to the government for 35,000 riel and 17,500 riel respectively. Due to rice shortages in 1995, a great number of guns were traded and the programme has had some success, for example, 37 automatic and semi-automatic weapons were collected from only six villages in Veun Sai Commune in 1995. All of the guns owned by the Kavet in Kok Lak Commune, Veun Sai were confiscated in the same year except for those owned by the village police and local militia.

The Kreung headman of Choui village, Ta Veng district said than none of the 30 families in his village still had guns; this may be an exception rather than the rule and it is probable that guns remain in most Highland villages,

although less than before. The buy-back programme continues.

TYPES OF WILDLIFE

The table below documents the animals species reported by villagers in the four communes in the survey studied for wildlife. This list is not exhaustive and does not imply that certain species are not present. This symbol (*) indicates those species which have been sighted in the locality in recent years.

Wildlife Species	Veun Sai Commune Veun Sai	Poey Commune O Chum	Hat Pok Commune Veun Sai	Lung Khung Commune Bo Keo
Monitor lizard	*	*	*	
Porcupine	*	*	*	
Pangalin	*	*	*	*
Water lizard			*	*
Tiger	*			*
Soft shelled turtle	*	*		*
Wild pig		*	*	*
Kouprey			*	
Sambar deer	*			*
Gaur				*
Crane	*			
Small barking deer	*	*		
Peacock	*			
Python	*	*	*	
sun bear	*			
Elephant				*

The most prevalent species in this survey (present in 3-4 communes) were monitor lizards, pangolin, soft shelled turtles, boar and python. The rarest (in only 1 commune) were sun bear, elephant, tiger, porcupine, crane, peacock, kouprey and gaur. It is significant that the rarest species are also some of the larger animals and it is probable that this is due to their lower numbers originally, greater hunting pressure in the past, and reduced ranges (habitats) due to deforestation in the region.

The data gathered during this survey is too limited for any valid comments to be made concerning local biodiversity or wildlife distribution. However, a general trend for the larger mammals to be located in more remote areas is evident from the research. In conclusion, it is hoped that the establishment of the Virachey National Park over 332,500 hectares of forest in northern Ratanakiri will play a significant role in the fight to protect the remaining wildlife in the province. However, at present, Virachey is little more than a 'paper park'. Most villagers living near the reserve know nothing about it and there is currently no management plan for the area. Regulations and enforcement by the local community regarding hunting in forests near the village and the national park buffer zone may be another strategy for increasing wildlife numbers.

Chapter 4
FISHERIES

A rapid study of fish and fisheries was undertaken from November 26 - December 4, 1995. The survey team consisted of Ian Baird, Advisor to the Lao Community Fisheries and Dolphin Protection Project, Khong district, Champasak province, Southern Laos; Ho Hong, Chief of the Environment division of Ratanakiri; Phiset, of the United Khmer Neura Students Group; and Hong Phia, Deputy Chief of the Ratanakiri forestry division. Two Chinese Lao-speakers from Mai village in Veun Sai district were also hired.

The research explored the Sesan River basin in the northern districts of Veun Sai, Ta Veng and Andong Meas. Most of the information was collected through informal interviews with villagers and government officials encountered during field investigations. As Lao was the medium of communication for the research, all local names are given in the Lao language unless otherwise indicated

FISH SPECIES DIVERSITY

Over 120 species have been confirmed to inhabit the Sesan River yet it seems likely that between two and three hundred are in fact present (Latin names are given in italics). Virtually all species are eaten by local people. It is not known whether there are any fish endemic to the Sekong, Sesan and Srepok River basins, but it remains a definite possibility as the rivers have not been well studied in the past. There are no non-native fish species known in the Sesan or it's tributaries. This is notable as the common carp (*cyprinus carpio*) and tilapias have become established in many other lowland rivers in the Mekong River basin and research has shown that caution should be taken not to introduce these species to other areas in the future.

FISH MIGRATIONS

Many species of the three rivers conduct seasonal migrations to the Mekong mainstream. A number are believed to travel from as far away as the Mekong Delta in Vietnam, the Tonle Sap lake, the Mekong basin in north-eastern Thailand, and even central or northern Laos.

May - July: When the monsoon rains begin and the rivers and streams begin to swell, a number of species migrate up the Sesan from the Mekong. These include *Scaphognathops* spp., *Mekongina erythrospila*, *Labeo sp*, *Bangana behri*, *Hypsibarbus* spp, and *Cyclocheilichthys* spp (hereafter referred to as group A fishes). These cyprinids enter smaller tributaries where they spawn during the wet season.

At this time, a number of species of 'black fish', including *Channa striata*, *Clarias* spp., *Systomus ophroides*, *Trichogaster* spp., *Rasbora* spp. (group B) enter streams and wetlands, including rice paddies where they reproduce.

A number of pangasid catfishes also enter the three rivers (group C). One such species which arrives in large numbers is *Pangasius krempfi* which reaches 20 kg. in weight. All individuals are in spawning condition when they arrive, although juveniles are not known in the Sesan.

Other pangasid catfishes (group D) include *Pangasius larnaudiei*, *P.hypophthalmus*, *P. bocourti*, *P. macronema.* Although the giant catfish *P.sanitwongei* (over 200 kg.) and the *P. pleurotaenia*, and *Laides hexanema* also occur, their migratory habits are not well understood.

Another group of large catfishes (group E) migrate into tributaries for spawning, including *Mystus spp.*, *Wallago leeri* and *W. attu.*

August - September: Mature *Labeo sp* and *Bangaga behri* (group F) migrate and spawn.

October - December: As the monsoon ends and water levels drop, many species retreat to larger perennial water bodies. The whole population of Pangasius krempfi (group C) descends the rivers and migrates down the Mekong to the South China Sea. Most Group D pangasids return to the Mekong. Group B 'black fishes' and Group E fishes retreat from streams to the larger rivers. Group A Cyprinids also enter larger rivers and migrate along the Mekong and upstream to Laos and Thailand where they feed until the following May.

December - January: Large *Probarbus jullieni* and *P. labeamajor* (group G) migrate unknown distances up the three rivers and fish in spawning condition have been caught at Veun Som Peuay in Veun Sai district.

February - March: As water levels drop further, group H fish migrate up from the Mekong and the Tonle Sap, and although some may stay in the Sesan year-round, most retreat to the Mekong as waters rise in May and June.

More fish migrate up the Srepok and Sekong as they are deeper than the Sesan and because there are larger wetlands in the upper reaches of the Srepok which are important spawning and feeding grounds. Furthermore, as explained by an old Lao man from Ban Ta Lao, groups A and H (particularly H) generally migrate close to the edges of the river. If they travel up the left-hand side of the Sekong, they will bypass the mouth of the Sesan, and if they migrate up the right-hand side, they are likely to travel right up the Srepok as it flows into the right bank of the Sesan. The man stressed that "the river has to be teaming with fish before a fair share of them go up the Sesan".

It must be noted that all the species listed above are of importance to the livelihood of local people, and virtually every family in Veun Sai, Ta Veng and Andong Meas is engaged in subsistence fishing. Only in the last few years have villagers begun to sell small quantities of fresh fish to traders in the district capitals.

FISHING METHODS

One highlander method of fishing involves poisoning fish with pulverised toxic plants and trees found in the forest. An example of this is the 'haveut' vine which is used in Veun Sai district. The yellow vine is chopped up and the bark separated out from the wood. Small stones are used to block off a section of a stream, and the bark is pounded before being soaked in the still water. The effectiveness of the poisoning is seen to depend on a number of factors, including what the poisoners have recently eaten. The Lao village headman from Ta Lao (Andong Meas District) said that the Lao use only one kind of vine to poison fish (kheua nam hen/haveut in Brao). The Andong Meas district chief said the Jarai use three species, and the Ta Veng district chief said the Brao and the Kreung know of at least ten species.

This method is frequently criticised as it indiscriminately kills all the fish in a certain area. Non-target species like juveniles of large species are killed along with other fish and under these circumstances, stocks can be seriously impacted. An older Kavet fisherman claimed that when he was young there were so many fish that people rarely ate the small fish. He confirmed the story of a number of others who reported that fish stocks had decreased dramatically in recent years. This situation is particularly crucial in Kavet communities as they rely on fish as their main source of animal protein.

The Andong Meas district chief claimed that poisoning is not damaging to fish stocks because it is not used in larger streams or in the Sesan. He stated that the method is mainly used in deeper pools after the water has stopped flowing from January to March. Most of the fish are believed to eventually die anyway once the pools dried up at the end of the hot season in April and May (although this is questionable as many tributaries of the Sesan such as O Lalay run perennially). He stated that highlanders could not afford modern fishing gears such as castnets, and that only small quantities of fish were killed for subsistence use; the method has been used sustainably for generations. It was reported that the Kavet only use this technique in the dry season and each family rarely uses poisons more than once a year. It is assumed that at this rate, stocks in O Lalay would not be greatly affected, although the combined impact of this could well be significant. Processed chemicals and pesticides such as cyanide and methyl parathion are apparently not in use for fishing.

Although efforts have been made by some government officials to prevent poisoning, levels of awareness and action vary from region to region. The

Kreung district chief of Ta Veng said villagers used to poison in the O Cheun stream and it's connected wetlands on an annual basis. He said that it has been illegal to use toxic plants for fishing since 1992, and claimed that the method was therefore not used anymore. Any offenders are fined depending on the severity of the offence. In contrast to this, the Jarai district chief of Andong Meas said that the method was not illegal and is still commonly used in his district. Kavet highlanders in Veun Sai also openly use this method and appear unaware of it's illegality.

All of those interviewed along the Sesan were in agreement that explosives fishing is very destructive to fish stocks. This method was apparently used extensively throughout the 1980's and early 1990's. However, officials from the three districts claimed that since 1994 or early 1995 blast fishing has declined markedly due to the enforcement of government regulations banning the method. This claim was backed up by villagers interviewed during the survey. However, some villagers and soldiers still secretly use explosives for fishing in remote stretches of the Sesan and it's large tributaries.

It is notable that many of the fish killed by explosives don't float to the surface until hours or days later when they have begun to go rotten. Still others simply elude the fishers and float downstream dead or 'dying'. The Lao and Chinese from Veun Sai are generally blamed for explosive fishing more than the highlanders.

Unfortunately, it was reported that explosives have accidentally killed or maimed large numbers of explosives fishermen over the years. The Veun Sai commune leader said that approximately 50 people were killed by explosives in the district since 1980. The district chiefs of Ta Veng and Andong Meas agreed that people have been killed as a result of using this method. The Veun Sai leader highlighted that soldiers used to sell explosives to villagers in the past, and that fortunately they have become harder to find and more expensive in recent years due to revised military policies.

FISH MARKETING

In addition to serving as a major source of protein, some fresh fish are sold to generate cash income. This is especially true of the Lao, although some highlanders do sell fish. In 1994 fish traders started to come from Ban Lung to the district capital of Veun Sai (Ban Fang), and soon after to Ta Veng and Andong Meas. Every morning one to three fish traders travel by motorbike to pick up fish from villagers in Ban Fang (depending on season and availability); only one trader goes to Ta Veng, and another to Andong Meas.

Most fish purchased from all three districts weighs over 1 kg each, and the standard buying price at Ban Fang is 3-4,000 Riel/kg. In Ta Veng and Andong Meas the same fish normally sell for just 2,000 Riel/kg. Perhaps prices are driven up by competition amongst fish buyers, as they need to ensure people

will sell fish to them. It is probable that the Lao of Veun Sai are more aware than the highlanders of what the market prices should be. Furthermore, the roads from the provincial centre to Ta Veng and Andong Meas are more difficult to traverse than the road to Ban Fang, so traders must recoup their additional transportation costs.

The fish is put on ice and transported to Ban Lung where an average of 200 kg. is sold in the market every day. An unknown quantity of more valuable species are sent to Phnom Penh by plane before being transported to Thailand. Such species include; *Mystus microphthalmus (pa kheung)*, *Belodontichthys* sp. (pa khop), and *Micronema* spp. (pa nang).

Villagers in Veun Sai claimed that about 150 kg. of fish is bought per day in Ban Fang during the 'ton' fishing season compared to about 60 kg. during other seasons. Up to 100 kg. per day is bought in Andong Meas and Ta Veng, although the daily average is perhaps much lower. It seems that large fresh fish are the only fish products sold in northern Ratanakiri and although virtually every Lao family makes fish sauce, this is not part of the traditional diet of highlanders athough it is still found in parts of the Mekong River..

TRADITIONAL BELIEFS RELATED TO FISHERIES

Due to a fear of ghosts (phi), serpents (gneuak) and crocodiles (khe), the Lao rarely used to fish in deep pools. Times are changing along the Sesan and they are no longer afraid of such creatures; pools are now favourite dry season fishing grounds. As this 'cultural protection' declines, fish stocks may be adversely affected. For example, older Lao people remember *Boesemaia microlepi* (pa kouang), a large species which dwells in the Mekong and is now considered extinct in the Sesan River.

Kachok elders and villagers surprised the research team by laughing at the idea of 'river spirits', and as one old man explained; "Of course there are no spirits in the water. They are all on land and in the forests." It seems probable that the Highlanders don't normally fish the deep waters because none of their traditional fishing gears are appropriate and because they are fearful of drowning as few are good swimmers. The Kavet do however believe that there are spirits in the water.

The Lao are known to make small offerings of home-made rice whiskey and cigarettes to water spirits in order to ensure that particular fishing gears catch a lot of fish. It is not known whether this is also true of Highlanders.

CONSUMPTION PATTERNS

Lao villagers claimed that they rarely eat big fish as they are not as tasty as medium or small ones. It is probable that until larger species were highly sought after for sale to traders, this practice served as a significant protection

mechanism for a number of species. It is common for villagers to share some of their catch with others in the community on a regular basis. However, as fish become an increasingly marketable commodity, fewer are given away to poorer villagers, especially with regards to the larger fish.

Particularly amongst Lao people, fish consumption is influenced by the belief that if people get sick, they should limit their diet or 'taboo' certain foods until they are better. The foods eliminated vary from person to person and from illness to illness, although some species commonly denied are *Bagarius yarrelli* (pa khe) and *Mystus microphtthalmus (pa kheung).*

Typically, women are forbidden from eating a wide variety of foods (including some fish) after giving birth or during pregnancy. These fish species are perceived as being poisonous to the ovaries (phit kaboun), and the most notorious is *Cosmocheilus harmandi* (pa mak ban). *Trichopsis Vittatus* (pa mat) also falls into the same category.

The Irrawaddy dolphin, *Orcaella brevirostris* (pa kha in Lao and boun sout in Kreung) was previously known in the Sesan, but has not been seen in any of the three districts in Ratanakiri which encompass the Sesan River since 1976. The dolphins used to travel up in the rainy season before returning to the Mekong in the dry season. Neither the highlanders or the Lao have ever been known to hunt or kill dolphins. The Lao believe that the dolphins are the friends of humans and that they protect people from crocodiles and other dangerous aquatic animals. Furthermore, a traditional fable relates that dolphins originate from reincarnated people. Villagers reported that dolphins are still evident in the Sesan in the neighbouring province of Stung Treng.

TRADITIONAL MANAGEMENT SYSTEMS FOR FISHERIES

Consistent with other areas in Ratanakiri, the population density along the Sesan is low. In 1994 there were 8,630 people in Veun Sai, 5,831 in Andong Meas, and 3,982 in Ta Veng (Bourdier, 1995). There was no need to limit particular fishing gears because nobody had the ability to significantly reduce fish stocks. Since fish were not marketable until recently, it would have been a waste of effort to catch more than could be eaten. For the Lao as other ethnic groups, structured resource management systems generally only emerge when it is widely perceived by a community that the resource is threatened. There is now an overwhelming consensus that fish stocks have been heavily reduced compared to previous years. Some possible reasons for this include; heavy explosives fishing, deforestation throughout the Mekong basin, hydropower and irrigation dams outside Ratanakiri, increased use of pesticides outside the province, increased population throughout the Mekong basin and the widespread introduction of modern fishing gears.

At present villagers in Ratanakiri have not noticed any changes in fish stocks due to the Yali Falls Dam on the Sesan river in Vietnam. This dam is presently

being completed, and it is possible that the dam may cause significant changes in seasonal water and silt flows downstream.

There appears to be widespread support amongst the general population for limiting destructive fishing gears. This would at least be a step in the right direction. The majority of direct criticism is directed at explosives fishing as that method has been the most visibly destructive along the Sesan.

Kreung villagers from Choui village, Ta Veng gave an account of controversy concerning fish resources in their area. They rely heavily upon local wetlands for much of their animal protein, and these are perhaps a more important source of fish than the Sesan itself. A conflict has recently arisen with ethnic Lao villagers from Veun Sai who use large nets (which the Kreung do not have) during the dry season to fish the wetlands. The Choui villagers are concerned for their fish stocks which they claim have rapidly decreased in recent years. Their appeals have apparently fallen upon deaf ears as the Lao view the wetlands as an open access resource for all to use. In 1995 the local people resorted to detaining Lao fishers but met with little support from Ta Veng Leu Commune.

It has been confirmed that many other communities in Ta Veng are facing similar problems and that the district administration supported their cause by announcing two years ago that villagers from other districts wouldn't be permitted to use large seine nets in wetlands unless the local villagers approved. However, it seems likely that they don't have a clear strategy for dealing with the problem. Perhaps this problem also persists in Choui as it is far from the district centre and communications are poor. It is evident from this example that proper management of wetland fisheries could considerably improve the food security situation of communities who rely on them for food. Villagers from Choui said they would welcome any external assistance to help them solve the wetland problem.

COMMERCIAL FISHERIES

Until 1995 when the Veun Sai administration granted a fishing concession to a Ban Lung businessman, there was no large-scale commercial fishing along the Sesan in Ratanakiri. The following case study illustrates the potential for conflicts between stakeholders as interest in the development of commercial fisheries grows in the region.

'Yo' fishing on the Sesan

A large type of net from Stung Treng (yo in Khmer) was to be used to block the mouth of O Lalay stream, a tributary of the Sesan. Group A and B fish were to be caught as they retreated to the Sesan, and for a permit covering the months of October and November the district expected to receive US$ 450 worth of gold.

Before this could begin, the Lao and Chinese community of Ban Fang heard about the deal and strongly objected to 'yo' fishing as their village is adjacent to the mouth of the O Lalay. They were concerned that fish stocks would be affected as the concession would have consumed the whole lower section of the stream. Furthermore, a toxic mineral used to chase fish into the 'yo' (hin dam) would be particularly destructive. The leader of Veun Sai commune supported their cause and in view of the local opposition, the district chief told the concession holders to find another stream to block.

The commercial fishermen relocated from O Lalay to another tributary, the O Kan Seng in Kan Seng commune, Veun Sai. Although villagers suspected that the leader of this commune had accepted money from the 'yo' owners in the face of local opposition, catches at O Kan Seng were considered poor and the fishers eventually moved their operation up to Ta Veng. However, their permit was not valid outside of Veun Sai and the Ta Veng district administration soon arrested them. They were fined 500,000 Riel which they could not pay so they opted to sell their net to a local policeman.

It is widely known that Ta Veng people do not like outsiders exploiting the resources of their district. However, the policeman who bought the net was a local Lao and it was agreed that the 'yo' net could be used by him and his partner in the O Kampha if the district could receive 30% of the catch. After visiting the site, the research team expressed their concerns to the district chief about negative impacts on fish stocks, and increasing inequality between commercial and artisan fishers.

He confirmed that the fishery was to be conducted only on a trial basis, and that if problems were observed the practice would be curtailed next year. He stated that there had been no local opposition and speculated that this was perhaps because villagers were still allowed to fish close to the 'yo' site and the use of the toxic mineral 'hin dam' was strictly prohibited.

A Brao fisher (from nearby Ban Pakeut) explained that no-one had been consulted about the appropriateness of the fishery and he was unsure if the village headman had been informed. He confirmed that no-one had formally protested, but stressed that a number of villagers including himself, were

concerned about declining stocks as they depended on fish for food. He felt powerless to express his feelings because he considered himself to be "just a normal person."

In recent months the Ta Veng district authorities decided to offer no further commercial concessions in the district and cancelled the previous contract. This apparently followed Highlander objections to the O Kampha stream concession and it's possible negative impacts on fish stocks in the Sesan. The combined efforts of villagers from many communities were therefore eventually successful.

The Lao Veun Sai commune leader also explained that the O Lalay case was not the first time he had heard of local opposition to 'yo' fisheries. In 1994 he had been contacted by the chief of Sekong commune, Siam Pang district in Stung Treng. He was highly critical of a 'yo' fishery along the O Samong stream, a tributary of the Sekong. Local people had been unsuccessful in persuading senior district officials to oppose the practice, and were calling upon the people of Veun Sai to put pressure on the Siam Pang officials who had granted the concession.

Chapter 5
AGRICULTURE

Just as paddy rice is at the heart of lowland Cambodia, swidden agriculture has been the basis of life for generations of indigenous people in Ratanakiri. Swidden agriculture (sometimes referred to as shifting cultivation or slash and burn) has been the main cultivation practice in the region except in the Khmer Rouge regime (1970-79) when the highland people were forced to live in co-operatives and cultivate paddy rice. Due to resettlement schemes over the last 30 years, some groups in the lowlands such as the Kachok, Brao, Kreung and Kavet now cultivate some paddy rice, as do the Lao and Khmer. In addition to indigenous groups, lowland Khmer immigrants claim new land with local slash and burn techniques but they do not practice fallow.

Pressure from the Government continues at the central, provincial and district levels for highlanders to be relocated in order to practice paddy in the lowlands, and much debate surrounds food security and the sustainability of swidden agriculture. Agriculture has been included in the Natural Resources and Livelihood Study (initially NTFP's) as it was found to be the most important economic activity and can be thought of as being a form of forest management. The upland swidden system has given rise to a communal land tenure system which is common to all indigenous ethnic groups in Ratanakiri as well as many of the ethnic groups in neighbouring countries.

The traditional livelihoods of minority groups are based on upland systems, and the wide variety of crops and the staggered harvests serve as appropriate and sophisticated strategies for assuring food security. Furthermore, there is insufficient land suitable for paddy cultivation in the areas where people currently live. The direct results of such 'paddy relocation' would therefore be the destruction of swidden agricultural systems, highland settlements, minority communities and local cultures. Within this context, the 'Natural Resources and Livelihoods Study' focused primarily upon highland cultivation, of which little is known by outsiders in the Province or elsewhere in Cambodia. Such upland agriculture does not necessarily imply a 'mountain' environment, but it's rainfed nature stands in contrast to 'lowland' water-based paddy systems and it is often carried out on moderately sloped land. A key objective of the research was to investigate opportunities for intervention, particularly in terms of livelihood sustainability and conflict resolution.

A rapid study of traditional highland agriculture was carried out from February 3rd to February 16th 1996. The researcher was Yech Polo of the Department of Agronomy, Ministry of Agriculture. The study investigated the agricultural practices of Kreung groups in O Chum District and of Tampuen groups in Bo Keo District. Ian Baird et al also considered Kavet, Brao and

Kreung swidden agricultural systems in detail between March 1 and 14th. Yech Polo visited 13 Kreung villages in the Communes of La Ak, Poey, and O Chum (O Chum District) and in 3 Tampuen villages in Lung Khung Commune (Bo Keo District). It must be noted that the Kreung and Tampuen systems studied were almost identical except that after rice harvesting in November, the Tampuen plant crops such as mung beans and ground nuts and they do not plant lowland rice. The following discussion provides a detailed account of the crop varieties found in the chamkars.

RICE

Rice is the central or staple crop of the swidden system and in each chamkar 3 -7 varieties of rice are usually grown (short, medium and long term). Rice seeds are mixed with other seeds such as sesame, cucurbits, legumes and sugarcane. Upland seeds are 'dibbled' (put into holes poked into the ground with a long pointed stick, 120-200cm long). In most cases, the men walk around with a long pole and poke holes in the ground and the women follow and deposit various seeds into the holes.

In the 1st and 2nd years of cultivating a new chamkar short term rice (cheh chamrok in Kreung) is planted. Long term rice (cheh chreng) is planted in the 3rd and 4th years. The growing period for upland rice is between 3 and 5 months from planting to harvest, and the harvest time is spread over a 3-4 month period.

Whilst the Tampuen communities in the survey grow only upland rice, 7 Kreung villages also grow lowland varieties. 17 upland varieties were reported amongst the Tampuen and 26 amongst the Kreung where 5 lowland varieties were also identified. It is important to note that such species diversity provides considerable protection against pestilence, disease, drought and flooding. This is particularly significant as it was reported that all these varieties are reserved for family consumption only, so rice yields are critical for village food security.

An important aspect of village life is that if individuals or families don't have enough rice to eat for the whole year they are able to borrow rice from other members of their communities or from a communal rice store which is kept for festivals and community events. No interest is added to the repayment costs of borrowed rice and this is highly significant in terms of food security. Unlike in Khmer villages, NGO initiated "rice banks" are inappropriate as a good distribution system is already in place.

Amongst the Kreung communities, the number of upland varieties per village varied significantly. There were as many as 17 in Kreh village and as few as 5 in Svay village; with an overall average of 8 per village. The range between Tampuen communities was less significant as fewer villages were visited; 13 species of rice were reported in Lung Khung, 14 in Paor, and 16 in Pa yang.

The most common Kreung varieties include; cheh roboanh, cheh kavet, cheh dranh, cheh kradeau and cheh eung chheung. As many as 28 species of highland rice were identified in Lalay, a Kavet village in Veun Sai district. It is also noteworthy that almost all rice varieties planted by indigenous groups are indigenous and so called 'improved' varieties have not yet been introduced.

An example from the Kreung village of Krola, Poey commune (O Chum) clearly illustrates the relationship between soil quality, rice species and yield. In the first year of cultivation, *Ancheng* rice is planted in the original site (garden 1). This *Ancheng* site is extended in year two (garden 2) and in the third year (garden 3). Although it is not considered to be as 'tasty' as other types of rice, this species is a valuable staple and important for food security as it grows successfully on less fertile soils. By the fourth year (garden 4) when the site is extended further, both *Ancheng* and *Krotiew* are planted. In the final year of extension and cultivation (garden 5), the more 'tasty' species of *Krotiew*, *Kravet* and *Chambroh* can be planted.

Although the area under cultivation gradually increases as the plot is extended, it is interesting to note that the total yield for the entire plot falls relatively quickly from year 1 to year 5. Although the red soils of central Ratanakiri are acclaimed for their fertility, the soil quality falls rapidly under cultivation. The patterns in Krola village are illustrated in the box below:

YEAR	TOTAL YIELD	GARDEN
1	120 kapha's of rice	1
2	60 kapha's of rice	1+2
3	50 kapha's of rice	1+2+3
4	50 kapha's of rice	1+2+3+4
5	40 kapha's of rice	1+2+3+4+5

This dramatic reduction in yield from year 1 to year 2 is probably due to the washing away of the ash derived from burning. Usually the decision to abandon (fallow) a field is made because the weed problem increases year by year so the extra labour needed for weeding and the reduced yield make it no longer worthwhile.

ANNUAL CROPS

The number of annual crops in Tampuen villages is remarkably high with a total of 41 in only 3 villages. There appeared to be little variation in number between villages; with 34 in Lung Kung, 37 in Pa Or and 40 in Pa Yang. There were obviously a greater number of species reported among the 13 Kreung communities, with a total of 68. The spectrum between villages is notable; from 3 in Kouk Chah and 4 in Kouk Thmey, to 16 in Ta Ngach and 18 in Svay, to 29 in Tong Krabu and 31 in Tong Kroma, although this could reflect an improving research technique. A strong culture of exchanging seeds



The practice of mixing crops in the same holes is alien to the agricultural systems of lowland Cambodia. Highlanders maximise their use of field space by cultivating crops of different heights in the same places. For example, one may grow along the ground, another may grow upwards but not very high, and a third may grow tall and dominate the upper layer. Nevertheless, not all types of crops can be planted together in the same place and experience is required to determine which ones can grow well together. Apart from taking advantage of available space, this approach is important for maintaining a complete vegetation cover on the land. This discourages soil erosion, helps maintain moisture during dry periods and discourages the growth of grasses.

PERENNIAL CROPS

Perennial trees and shrubs are grown both in villages (in areas around households) and in the chamkar (often around chamkar houses). In both Highlander agricultural systems studied, fruits were the predominant perennial crops. Around Kreung households, the number of species ranged from 8 in Stuk, 9 in Khmeng and 9 in Ta Ngach to 17 in Tong Kroma and 19 in Tong Krabu. Perennials appear more consequential in Tampuen communities, whereby Pa Or village had 15, and both Lung Khung and Pa Yang had 17 fruit crop types.

Perennials situated within the chamkars were fewer, from 10 in the Kreung villages of Stuk and Ta Ngach to 17 in Kouk Thmey and Tong Kroma, and 18 in Tong Krabu. Numbers were lower amongst the Tampuen, from 3 in Lung Khung to a maximum of 9 in Pa Yang. Perennials evident in all of the Kreung villages were papaya, mango, banana, jack fruit, kapok, pineapple and coconut. Perennials in all the Tampuen villages were papaya, mango, coconut, tamarind, banana, guava, jack fruit, lime, pomello, small sour orange, sour sop, kapok, pineapple and betel leaf. Finally, Kreung crops recently adopted included; cashew nuts, mangosteen, sour sop and coconut. New Tampuen types were cashew nuts, small sour oranges, sour sop, custard apple and egg fruit.

CROPPING PATTERNS

Apart from mixing crops, other traditional strategies ensure that crops are planted in the most appropriate places. Chilly plants and egg plants are planted along the edge of burnt trees in order to make use of fertile ash; shade is also provided for part of the day. Tubers, yams and cassava are regularly grown on the outer edges of fields in order to ensure that their vines don't consume too much of the agricultural land in the centre of the field. Herbs and spices are planted close to the farmhouse for convenience as small amounts are often needed at short notice. In addition, many crops are planted just inside the chamkar where tree leaves and straw are piled up and burned, as this clears and fertilises the soil. Such crops include; corn, sweet potato, sugarcane, pineapple, cucurbit, tobacco, cashew nut, mango, citrus,

and legumes.

In short, Highlanders do not plant their crops in a haphazard way and planting takes a lot of planning and experience and is based on a sound understanding of natural conditions.

The following steps in the cropping cycle apply to the Kavet, Brao and Kreung living in northern Ratanakiri near the Sesan River where the soils are white and less fertile than the soils of the central plateau. As a result the cropping period is shorter:

(1) The first step is to identify a piece of land which is forested, has good soil and is suitable for agriculture. Many set up their fields so that it is possible for them to expand to adjacent forested lands the following year. If a family's fields are not next to each other they will have to conduct two ceremonies for the spirits in both areas and as this is a costly and time-consuming process it should be avoided wherever possible. One new piece of forest is cleared each year and most crops are planted in the new fields; the soils in the older fields are less productive.

(2) In February the chamkar is prepared by the cutting of shrubs, vines, underbrush and small trees. This is primarily done by men but women may assist. This job may take many days to complete.

(3) The large trees are cut in March. This is done by the men as it is considered to be somewhat dangerous as there have been cases whereby trees have fallen on farmers causing serious injury or death to the choppers. This process requires co-operation and the exchange of labour between men of different families and 3 or 4 men will usually work together preparing one field before moving on to another family's land.

(4) Once the felling is completed, the area is left to dry out for a number of days before being burned in April.

(5) After the first burning, there may be some parts of the plot which have not burned so well. The remaining debris and leaves are piled up and burned in mid-April whilst the chamkar house is constructed or repaired.

(5) The Highlanders await the rains after the preparatory work has been completed. Most crops are planted in June when the first rains fall; corn is sown first (before rice) and tobacco is the last crop.

(6) May to August is the cultivation time when weeding is also necessary before the rice seeds sprout. This labour-intensive process is crucial due to the ability of grasses to dominate swidden crops. The amount of weeding required is a key factor in determining how satisfied villagers are with particular chamkar sites. A second weeding is undertaken when rice plants

are approximately one foot high.

(7) August to January is the harvest season. Different types of rice, fruits and vegetables are harvested over a period of many months. This helps to ensure a stable amount of food for subsistence purposes over a relatively long period of time and this strategy maximizes food security.

It is notable that when the chamkar is abandoned, most farmers do not take care of the remaining trees. However, as outlined in Chapter 1 some farmers living in close proximity to Ban Lung have begun to plant semi-permanent commercial crops such as cashew nuts, mangosteen, pineapple (annual) and citrus, instead of allowing natural re-growth in the chamkar.

ANIMAL RAISING

Livestock such as buffalo, cows, pigs and chickens are raised in villages and are allowed to roam freely, although pigs and chickens may also be protected within pens or farmhouses at certain times. Livestock are used primarily in ceremonies and offered to spirits relating to agriculture or to cure illnesses. Throughout the growing season from May to December the cattle are tethered in order to protect the crops, whilst at other times they are allowed to range free.

GENDER AND AGRICULTURE

During the research, many Highland villagers discussed the roles and responsibilities of men and women in their communities. The positions of men and women in the different communities and Highlander ethnic groups were largely the same with a few exceptions. Due to variations in culture and agricultural systems, the gender relations of the Lao, Khmer and Chinese are somewhat different to those of Highlander communities.

The most significant distinction is the heavy time constraints that women are under due to their child care and domestic responsibilities. Studies in the villages of Lalay (Veun Sai) and Choui (Ta Veng) indicated that due to their more submissive role, women are less able to travel to the district market and participate in the sale of commodities. Unlike Khmer, Lao and Chinese women, Highlander women are less involved in buying or selling activities with outsiders; the men are in charge of the family finances, and make the decisions concerning how money will be spent. One reason for this is perhaps the inability of most women to speak Khmer, the language of commerce. Many men also have this disadvantage, but as a rule, men have a better understanding of trading. The inability to count money or read scales was cited as an additional barrier to women becoming involved with external sales. The growing trade outside the village may in fact be responsible for a widening gap in power relations between Highlander men and women.



STORAGE

Highlanders select seeds from the previous year's crop, and these are kept for 5 to 6 months. Rice seeds for propagation are stored separately from rice supplies for daily consumption. Those reserved for planting are kept in the field until they are completely ripe. Rice, corn, gourds, sugarcane and legumes are hung on the roof near the kitchen. Tobacco is hung on the fence of the farm (or the village) house and sometimes the seeds are extracted and kept in a 'bottle gourd container'. With cucurbit, the seeds are washed and dried and kept in a 'gourd'. For dioscoreas and other tuber crops, the tubers are usually kept in the soil, but sometimes in the house. The stems of cassava, sweet potato and sugar cane are kept in the fields.

Many Highlanders rely heavily on a preserved vegetable sauce made from the leaves of a number of crops (called Phak nam in Lao). Stored in sections of bamboo, it may be consumed in seasons when fresh vegetables are not easily available or when a heavy workload makes it difficult to find the time to collect vegetables. In the past, vegetable sauce was often mixed with the bones and skin of animals such as buffaloes and deer. However, the appropriateness of this is obviously questionable due to the rapidly declining wildlife stocks in Ratanakiri. Fish are also dried in the sun and packed into bamboo sections to be consumed later.

Chapter 6
PATTERNS OF NATURAL RESOURCE USE

This chapter will explore the patterns of NTFP use evident in Chapters 2 - 5. Issues of sustainability will also be discussed, along with a number of possibilities for intervention in the future.

Uses and value - It is apparent from the research that NTFP's are essential to the livelihoods of highland communities in Ratanakiri. The local people depend on them for many things such as housing, household utensils, fish, wildlife, food, game, income and forest fruits. This importance of forest products in every day life indicates that there is a strong incentive for local people to protect the forest.

Types - Numerous forest products were described in each of the categories; food, traditional medicine, wildlife, fish, handicrafts and construction materials. The immense diversity of products is remarkable, for example 60 forest vegetables were reported. However, the level of knowledge about which products are marketable is inadequate at this stage.

Collection - It is clear that in many cases traditional collection methods are far more sustainable than more modern techniques. This is illustrated in the case of 'yo' fishing nets on the Sesan river, or explosives fishing as opposed to the use of smaller nets. This also applies to hunting whereby crossbows have a lesser impact on wildlife stocks than do AK 47 rifles. Finally, the cutting of malva trees due to accelerated market demand illustrates an unnecessary waste of resources.

Seasonality and source - Forest foods supplement swidden agriculture and are vital for food security. Plants such as wild tubers are collected at times of rice scarcity and it is significant that most forest fruits and vegetable are in season during the dry season when virtually no food crops are harvested. Many of the most important NTFP's have some protection under customary law (such as through a belief in forest spirits). However, this system is not yet formalised within the village or recognised externally. Such traditional checks are not effective where communities have been disturbed, for example the lack of controls on forest fires in Lalay village, Veun Sai where the villagers have been involuntarily resettled on numerous occasions.

Availability and sustainability - For products which are not generally marketed such as forest fruits and many forest vegetables there is no

threat to availability. Most NTFP's are sustainable whilst demand is at a subsistence level. There is varying availability amongst marketed products such as malva nuts. In many cases availability is already declining such as with the 'Pa-O' bamboo collected by the Kavet people in northern Veun Sai. True sustainability requires some management intervention and limits on harvesting. Wildlife stocks are an urgent issue which must be addressed as many are hunted and sold to markets in Phnom Penh, China, Vietnam, and Thailand.

SUSTAINABLE RESOURCE USE

In order to protect the natural resources of Northeast Cambodia and improve the livelihood of the people, customary natural resource stewardship must be maintained or restored. Marketed products must also be managed for sustainability and equitable benefits to people. It must be noted that whilst forest and fish products have a limited supply and whilst subsistence demands are limited, the market can have an almost unlimited demand. There is some scope for marketing more NTFP's to supplement incomes, but this must also be done with caution. Planning must be community-based in collaboration with the Provincial and District authorities. Co-management of natural resources should be encouraged so that customary village rights and government realities can co-exist more easily.

It is significant that swidden agriculture has been relatively sustainable (low impact and high forest cover) for many centuries until recently. Opportunities for cash income generation for Highlander communities are growing along with interest in access to external resources such as modern medicines.

Many regard swidden agriculture as no longer sustainable and seek to change minority agricultural practices. However if a number of requirements can be met, such as (1) sufficient land for forest re-generation (fallow) and (2) agricultural systems which mimic the forest (diverse crop species to reduce weeds, pests, disease, fertility loss, and erosion) then it is probable that swidden could be feasible over the longer term. If this is not possible, the current system must be adapted to declining land availability, increased cash crop demand, and increased livelihood demands. Some voluntary Highlander adoption of lowland wet rice agriculture to supplement swidden may also be desirable in some cases.



OPPORTUNITIES FOR INTERVENTION

It was evident that many villages have had limited dialogue with outsiders, including government representatives. Many are out of touch with the provincial and national economy, and are unaware of prices, market demand and other business management issues of relevance. Such dialogue would be invaluable as a forum to discuss future plans, new pressures in the Province, and ways of coping with them. Another significant issue is the low level of literacy amongst minority villagers. A number of villagers interviewed expressed interest in learning to read and write. Many people, especially women also have difficulty in counting money and reading weight scales. It is apparent that due to the remote nature of many highlander villages, and the division of time between village and chamkar, a system of non-formal education would be the most suitable if compared to a standard institutional approach.

(1) With the market economy expanding and both national and international investment increasing in Ratanakiri, it is clear that villagers could benefit significantly from some collaboration on education issues. Natural resource use/conservation issues, trade and investment, health, and other livelihood issues could be discussed in this forum. For example; what are the consequences of unsustainable NTFP harvesting? Who has the right to collect NTFP's in which forests? Can agreements be made with commercial fishermen which will safeguard the interests of artisinal fishers? How much forest can Highlanders sustainably clear each year for making chamkars? How can communities manage their malva nut trees? How can explosives fishing be controlled?

(2) Such discussions could also benefit micro-enterprise development for NTFP's. Business and trading skills would be particularly useful for women. Which products are marketable? Where? For how much? What level of collection is sustainable? Do opportunities exist for product differentiation? Do people have time for small business development? Is food processing a viable option? What options are available for maximising value-added income related to NTFP's?

(3) Health issues have not been a central theme of this research as other comprehensive studies have already been carried out in Ratanakiri. However, the role of traditional medicine has initially been explored. It is clear that although highlander groups rely more on sacrifices and less on traditional remedies than do the Lao or Khmer, even for the Lao and the Khmer, the knowledge of the older healers is in danger of being lost unless efforts are made to pass it down to younger generations. Opportunities may also exist for small-scale income generation by increasing the production and sales of local medicines. There are also opportunities for increasing the knowledge of Highlanders regarding Lao

and Khmer traditional medicines, as Highlanders often express an interest in this.

(4) It is evident that there will be increasing pressure for highlanders to engage in settled farming (whether this involves some paddy cultivation or not). In the future highland communities may need to develop alternative cultivation systems, combining various elements of chamkar farming, plot rotation, paddy rice and other 'sustainable agriculture' techniques. Some possibilities include; contour planting, agro-forestry, tree-planting in fallow lands, alley cropping, mulching, and leaving trees on the contours. Whether or not settled farming becomes a reality; in this context it seems that agricultural interventions of some kind would be wise, and that now is the time for such ideas to be tried out.

As a result of reflections on the changing pressures on natural resources in Ratanakiri, it became obvious that rights of access to natural resources will be a critical issue for sustainable management. In particular, security of land tenure cannot be dissociated with secure livelihoods for the future. In the past this was not a pressing issue because little competition existed, and what did exist could be settled in Highlander ways. Chapter 7 will explore themes such as customary land rights, land tenure, commercial investment, and encroachment within a number of case studies.

Chapter 7
LAND

The key theme of this chapter is to investigate the growing pressures on land in Ratanakiri Province. Local, national and international investors are increasingly interested in both timber extraction and industrial plantations such as rubber, tea, coffee, palm oil and soybean. Although investment is growing, there appears to be little clarity concerning who owns land in Ratanakiri and opinions evidently vary. As the original inhabitants and stewards of the region, until recently the highlanders encountered little competition to their customary tenure systems. It is increasingly evident that many people do not regard the Highlanders as landowners as very few have legal title. Many outsiders assume that all land without a certificate of official tenure is government property. However, under traditional customary tenure systems, those who have occupied and used the land since ancestral times have established a prior right.

A critical issue at this stage is the significant difference between the system of individual titles which is promoted by the land titles department and the Highlander concept of communal village land. Community land is not divided into individual titles as is typical of lowland Khmer communities and village lands are communal. Villagers cannot encroach on the land of a neighboring village and neither can the neighbors encroach on their land. According to customary law if anyone wants to clear land for a garden on the communal land, they must first come and live as a citizen in the village.

This external pressure for land and the unclear nature of ownership has had a number of negative consequences, particularly in areas close to the provincial capital. A number of incidences have occurred whereby investors simply put up signs entitled "LAND OF COMPANY X" and then applied for title in an effort to annex village lands. This continues due to the lack of clarity on land ownership. As a result, especially near Ban Lung some villagers are unsure how long they will still have access to their land and an increasing number of villagers have opted to sell their land through informal channels and for deflated prices as they fear they could lose it anyway without compensation. This has further weakened the fallow cycle on which swidden farming depends. On the other end of the scale villagers living far from the roads and markets are mostly unaware of the need for (or even the concept of) formalizing land tenure.

Research for the "Natural Resource and Livelihood Study" suggested that those who already have title or who are in the process of applying are predominantly lowland Khmer and Lao people. This may be a result of their familiarity with the concept of individual titling, or because the majority are settled close to Ban Lung town. A number of Khmer people living in Kon

Mum, Lumphat, O Yadav and Veun Sai are also putting in applications. Small groups of soldiers were reported to form small companies and apply for titles in group name. The following case studies explore a number of these issues in greater detail.

A. CUSTOMARY LAND TENURE IN CHOUI VILLAGE TA VENG DISTRICT

This discussion is an extract from a study commissioned in northern Ratanakiri for the natural resource study. The material is presented in "The Kavet and the Kreung: Observations of Livelihoods and Natural Resources in Two Highlander Village in the Districts of Veun Sai and Ta Veng, Ratanakiri Province, Cambodia". Written by Ian Baird, Kaneungnit Tubtim, and Monsiri Baird, August 1996. The research was carried out in Ta Veng District between 11-16 March 1996. The team were accompanied by Kham Teuang, the former Deputy Governor of Stung Treng Province, who served as a translator for the Brao and Kreung languages.

Ta Veng was established in 1985, a few years after the many highlanders who fled the Khmer Rouge returned from Laos and Vietnam. 15 of the villages in the district are Brao and 4 are Kreung, including Choui. It is notable that the villagers make a clear distinction between themselves, the 'River Kreung', and the larger group of 'Mountain Kreung', such as those living in Poey Commune, O Chum District. Choui village is home to 32 families and is situated on the southern bank of the Sesan River in Ta Veng Leu Commune in the most eastern part of the district. There is no road access from the district capital and it takes over an hour by boat to travel to Choui in the dry season.

The village is presently situated where it was prior to the 1970's. Choui was heavily bombarded during the U.S. aerial bombing and the villagers hid in the forest for three years. At the end of this ordeal, the village was demolished and the surrounding forests had been flattened. Due to their dislike of Khmer Rouge activities, in 1975 the inhabitants of the village joined 20,000 Highlanders and ethnic Lao in walking to the Vietnam border. Until the early 1980's when they were repatriated by the Cambodian government, they lived and did swidden agriculture on the Vietnamese side of the border.

The villagers are currently farming on their traditional lands and have no plans to relocate in the near future. As they fled the Khmer Rouge regime, they have no experience of lowland paddy cultivation and unlike other Highlander groups, they have been under little pressure to convert to fixed rice farming. The Kreung have defacto tenure over a very large piece of land on the northern side of the river where a major Khmer Rouge military camp was established in 1975. This site was chosen as the wetlands in the area could be converted into very good paddy land. When the Kreung returned,

they found hundreds of hectares of prime paddy land around their village but they had no desire or ability to farm it. They engaged in swidden agriculture nearby and the paddy land has been somewhat abandoned ever since.

It is interesting that a number of villagers expressed an interest in wet rice farming, and three families have already experimented with paddy plots. However, instead of using buffaloes to till the land, they prepared the fields by hand so the cultivated area was very small and insufficient rice could be produced. Follow-up research revealed that those Kreung who do own buffaloes are unwilling to put them to work, and are particularly averse to renting or lending them out to others. Buffaloes are kept specifically for sacrificing at spiritual ceremonies. The Kreung stated that they would feel sorry for a working buffalo, and that a tired buffalo would not be as effective when sacrificed. Thus it is culturally inappropriate for them to use buffaloes to till paddy land. None of the families who own buffaloes have tried paddy farming.

There is an area of lowland paddy farm on the south side of the river which is believed to be haunted by dangerous spirits. Villagers first became afraid when two people died suddenly in the area. As a result, it is believed that this area cannot be cultivated.

Although a number of people conveyed an interest in paddy, the cultural beliefs above serve as obstacles to the adoption of lowland farming techniques. This issue is particularly crucial considering the sustainability and politically uncertain nature of their current agricultural system. Although the Kreung should not be forced to switch over to lowland fixed rice farming against their will, the dikes have already been built on the fields so it wouldn't take much work for them to begin re-cultivating some paddy areas. They would be able to maintain some swidden fields at the same time.

LAND PRESSURES

It is important to note that if the villagers don't claim and utilise the nearby paddy land, someone else soon will. This could seriously marginalize them in terms of their land tenure position. Pressures such as commercial interests are inevitable and it would be wise for the villagers to prepare themselves for the future. In this context of change and external interests, it is imperative for customary land systems to be understood and accepted externally. Some of the principal features of present (informal) community to community agreements are illustrated in the following account of land change in Ta Veng Leu Commune.

As stated earlier, village borders frequently imitate geographical boundaries such as rivers and streams. The eastern boundary of Choui with the Jarai village of Malik in Andong Meas district was Tamo stream. To the west their boundary with the Brao village of Ta Bok was Nong Tro, a natural pond and

wetlands area. To the south, Jeun stream acted as the boundary between their lands and those of the Kreung village of Chan. The northern village border was the Sesan river. People typically recognise the legitimate land rights of their neighbours and land conflicts were apparently rare in the past. This understanding was threatened in 1984 when Chan village was pressured by the government to relocate from lands south of Jeun stream to a new village site next to the Sesan (traditional Choui land). However, because of the forced nature of this move, the Choui villagers did not blame them for moving onto their land and initially there was no new boundary set between the two villages; possibly because the villagers feared the government would be displeased if they did.

As time passed and land pressures increased, it was decided that boundaries should in fact be set so that conflicts could be avoided, and spirits should not be offended. The elders of both villages met in 1994 and agreed that all lands east of Aran Teng stream to Tamo stream would be given to Chan village and all lands to the west of the stream to Nong Tro pond would remain the property of Choui. These boundaries remain in use today although the authorities have not been officially notified.

Prior to recent years, all Ta Veng Highlanders were prohibited from living in, or cultivating lands north of the Sesan due to fears of Khmer Rouge infiltration. These fears have currently diminished along with the influence of the Khmer Rouge. Although no new villages have been officially resettled to the north, many people have recently started cultivating in this area. For neighbouring Ta Bok village, this signifies a return to their traditional lands.

There is now insufficient Choui land south of the river due to slow rates of forest regeneration. This is a result of uncontrolled forest fires and the rapid growth of grasses along the banks of the Sesan . Before extending their activities over the river, the villagers first had to consider the position of other villages. The Brao elders of Ta Bok agreed to their request and a western border was established which still remains in use today. The Kreung are to stay east of Ta Bok and Paiya streams. As their eastern neighbours are Lao (who do not practice shifting cultivation), a similar arrangement was not deemed necessary. The Jarai village of Moui is situated some way to the north in Andong Meas district and as yet no border has been established. This indicates that boundaries are only developed when the cultivated areas of two villages begin to get close to one another and Highlander customary land tenure arrangements are clearly set up to address real needs rather than established unilaterally.

This apparent lack of official government acknowledgement (or knowledge) of village land ownership and of the boundaries created between villages indicates that villages like Choui are very vulnerable to having parts of their land given over to others by the authorities. These types of land conflicts have already become critical near the provincial capital of Ban Lung. The

potential for such disputes has not yet become apparent in the more remote areas such as Choui village. These northern lowlands are currently not as attractive to investors as the red soils in the central plateaux have more agricultural potential. Nevertheless, the lands along the Sesan River have great potential for large scale agribusiness due to their perennial water supply. When this promise is realised the Kreung and other Highlanders could be faced with serious land tenure problems.

It is likely that it will become increasingly difficult for Highlander villages to receive government recognition for their land tenure systems once outside investors begin bargaining with officials. However, the fact that Highlanders hold all the district government positions in Ta Veng may offer a window of opportunity for local people to get their lands recognised. It is also noteworthy that the individual ownership systems being pursued in some parts of Ratanakiri have not yet been introduced in Ta Veng.

B. LAND PRESSURE AND ENCROACHMENT IN PHNOM VILLAGE, BAN LUNG DISTRICT

Phnom village has been located at it's present site for five years. In the past it was situated where Ban Lung town is now located. Along with four other villages, it is a member of Yeak Laom Commune which is situated just 5 km from the provincial capital. Most of the commune used to be together as one village, but it became too big and the chamkars were too far away. Due to it's proximity to the commercial heart of the region, many of the land pressures which may soon be commonplace in Ratanakiri are already evident in Phnom village.

Phnom village is a Tampuen community of 167 people, most are swidden farmers but there are a number of soldiers, a teacher and a nurse. Although few adults can read and write, many of the children now go to the local school. The village chief represents the villagers at commune level meetings and reports back to them. Within the village, the role of the elders is to lead ceremonies and customs, give advice for weddings and matchmaking, resolve community conflicts, ensure agricultural production is sufficient so that all villagers have enough to eat, and facilitate access to land and NTFP's.

LAND CLAIMS

Villagers do not first need the headman's permission before clearing forests for chamkar land. As long as no-one already has rights to the land and it is within the village boundary, there is no problem. Boundaries are generally established by planting rows of cassava, bananas, papaya or pineapples. Dark, fertile soils in thick forests are preferred although most large trees have already been cleared by the many Brao refugees who temporarily settled in

the area on their return from Vietnam in 1983. Whoever cultivates the land has the rights to fruit collection afterwards when the land is laid fallow. New people to the village have land set aside for them by the elders. In the past, land conflicts only arose if someone from a neighbouring village encroached on their land. The disputed plot would typically be divided and the village boundary expanded. It must be noted that due to environmental and economic constraints, this continual expansion of territory is no longer viable.

Although swidden agriculture predominates, land use in Phnom village has begun to change in recent years. A number of villagers have planted small-scale commercial crops such as cashew, mango, oranges and jackfruit on permanent plots instead of allowing the land to lie fallow as is usual. Plots along the road are often used as orchards due to ease of access to the market in Ban Lung. It is notable that chamkar plots have not generally changed in size as farmers must be careful not to open up too much land (which cannot be managed) or clear too little (there will not be enough to eat). Consequently this fine balance serves as a control on land clearance rates for the swidden cycle. This also supports the notion that forests in Ratanakiri are not only depleted due to the actions of swidden cultivators (a common misconception), but also as a result of market growth, local business interests, national and international investment, and improved access, transport and communications in the region.

As the original inhabitants, the villagers consider the land to be their property in spite of the fact that none of it is formally registered. Whilst many do not perceive land pressures (and see no limit to the land available), others clearly do, but state that they have no money to apply for land title. There appears to be some confusion about the cost of application; for example a Khmer living next to the village suggested it costs US$3 for a plan to be approved at the provincial Land Titles department, whilst one villager was told it was US$100. None of the villagers have been properly informed of the correct application process, thus as yet, none have applied for land title.

LAND SALES

Attitudes towards land ownership are slowly changing. At one time it was considered impossible for land to be sold (as it is relied on for food), yet now perceptions have changed and a number of villagers have already sold small plots. The sale of 50m of road frontage by the chief has resulted in much jealousy and caused a 'domino effect' whereby other villagers also decided to sell. It is presently unclear how much land has been sold, and by who.

The obvious attraction of selling land is a cash income for land which is little used or considered unproductive. However, a number of people stated that they didn't want to sell at first, but that people kept returning and hassling them. Villagers were informed that in O Chum the Government took land from local people for a Hydro-electric power plant and did not offer

compensation. They were persuaded by local investors/entrepreneurs that if they did not sell their land, the Government could take it anyway without payment. They were intimidated, and their ignorance of official procedures was played upon.

The price of land is also ambiguous; one man received US $250 for the 'use' of 3.5 hcts along the road, but it is unclear how long this 'loan' is for. A close relative of a higher Provincial official paid almost US $150 to buy 1.5 hcts. The villager wanted US $300 but the buyer would not agree to pay more. The reality of the situation is that most villagers are unaware of the true value of their land. As a result of their self-sufficient nature, they are unprepared and unexposed to market prices. In each case the village chief and the commune leader signed the sale agreement. There is some speculation that for each transaction, the chief received a fee but this has never been confirmed.

The growth of the market and the monetarised economy is causing a breakdown of traditional society in Phnom village as concepts of communal land and self-sufficiency are challenged. Less rice is now planted as commercial crops gain popularity and rice can be purchased in the market. Land prices are rising, along with the number of investors in the Province. By acting individually on land sales, the unified nature of the village was eroded, yet in reality they were all taken advantage of by outsiders. This exploitation will continue if the villagers remain isolated from each other. It is probable that if the community had consulted each other, the outcome of the land sales would havebeen quite different; perhaps the land would have been sold at a higher price, or not at all. It is significant that as a result of this research, the headman took responsibility by admitting he was wrong to sell any land without conferring with the rest of the village. The case from a Kreung village in O Chum district outlined in the box below is an example of how highland villages could organise internally in response to the land situation.

Villager's policy on land sales in Krola village

A new system concerning land sales has initially been introduced by community leaders in Krola village, Poey (Chan) Commune, O Chum. Based on old traditions, it sets a precedent for other communities facing similar land pressures:

(1) Anyone wishing to sell land must ask permission from the village elders first. Otherwise they will be fined all the proceeds from the land sales and risk banishment from the village.

(2) If a villager sells a plot of land he must agree to contribute a specified percentage of the proceeds to a communal village fund.

(3) If someone sells land, he may not clear new forest to make more chamkar land.

* This system has been developed by the village elders since the time of the 1993 elections after some Ban Lung residents tried to grab land along the road nearby. Not all villagers interviewed in Krola were clear about the regulations of the new system, but to date no land has been sold.

C. INVESTMENT AND GOVERNMENT INTERVENTION IN TONG KRABU VILLAGE, O CHUM DISTRICT

Land pressure due to external investment is increasingly evident in the central, more accessible areas of Ratanakiri. Situated less than an hour from Ban Lung in the neighbouring district of O Chum, a land conflict arose in Tong Krabu village in September 1995. A newly established company comprised of commune and District officials and two Khmers from Ban Lung made a visit to the village. They approached a number of villagers in their chamkar and made their acquaintance; they sacrificed a pig and shared rice wine. They later informed the small group that they would borrow 85 hectares of land from the village to do commercial agriculture. They intended to grow soybeans, cassava and peanuts. None of the other villagers were consulted about this and no compensation was offered from the company. The villagers claimed that if the company had not been accompanied by District and commune officials, they would have protested early on.

The villagers were told that the land would be returned to them but it was not clarified how long this temporary arrangement was for. However, the villagers later discovered that the company had already applied for permanent land title. The company gained the necessary signature for this application by privately telling an illiterate village elder that the document he put his thumbprint to would guarantee that the villagers would not lose any more land.

In response to this, the villagers sent a message to the local authorities asking for the situation to be explained clearly and to be told when they could have their land back. A meeting was convened at the village in which local Government officials and company representatives informed the villagers that their application for land title had already gone as far as the Ministry of Interior for approval. The villagers did not know where to take their appeal to next and in order to make their disapproval known, they joined together to cultivate soybeans and rice in a communal plot in the centre of the disputed land. The land had been fallow for 3-5 years and seven families have a claim to future cultivation.

An opportunity arose for the villagers to make their situation known in the form of the seminar on "Sustainable Development for NE Cambodia" which was held in Ban Lung in February/March 1996. Representatives from 15 villages were invited to prepare case studies on development issues in their village, for discussion at this national seminar. researchers from the Natural Resources and Livelihood Study assisted the village to document their experience with the investment company. After approval by a meeting of all the villagers, the resulting case study was written up for presentation at the seminar.

The following appeal illustrates the villagers' feelings of powerlessness. They were not consulted, their opinions were not sought, and their customary land tenure and management systems were completely overlooked:

Appeal from the villagers of Tong Krabu

We, the villagers appeal to our beloved Government regarding two difficulties. Firstly, because of drought and because our people lack experience in agricultural production, we face a food deficit. We request the Government to please help us by sending expertise who can teach us how to improve our production.

Secondly, we face a problem about land on which to continue our agricultural production because now, a company has come to ask for land from our village on which to carry out their exploitation. This area of land has length 1700 metres and width 500 metres. We villagers do not understand the nature of this company's proposal but we see that this will be a problem for the future food security of our children and grandchildren.

Therefore we raise this request to all companies who want to use our land: please, Sir, explain your proposal clearly to all the villagers first. Then, please give us time to discuss together and give our collective opinion. We wait for you, Sirs to follow this procedure. This is the opinion of the people of our village, Tong Krabu, O Chum commune, O Chum district.

The land was intended as an inheritance for the descendants of the village, and such a loss could represent a considerable threat to the livelihoods of the villagers. Potential economic losses included access to timber, and arable and grazing land. If insufficient land is available for swidden cultivation, families may have to split up in search of other economic opportunities. Furthermore, the extension of village boundaries in search of new lands would inevitably create problems with neighboring villages or force encroachment into old growth forests areas such as neighboring “Veal Romplong”, a protected area

allocated by the provincial tourism department.

These findings were presented at the seminar in conjunction with details of a disputed oil palm concession in O Ya Dav district (see section C below). With assistance in documentation from the Provincial Analysis and Planning Team, village spokesmen from O Ya Dav gave an account of their circumstances. The two studies were discussed by the seminar participants in small groups comprised of government staff, NGO workers, and community representatives. Their conclusions / recommendations are documented below:

Recommendations of seminar participants

- Companies should have relationships with people first before they start a project. If people don't approve, then project shouldn't proceed.
- Don't let the companies cut trees or clear land anymore.
- If they cut trees must let local people know the location first.
- Replace trees that they cut already.
- Need more schools and teachers and better salaries for teachers.
- The company needs to respect the people.

(Sustainable Development in Northeast Cambodia: Seminar Proceedings 1996)

The seminar concluded with the development of a 'policy statement and action plan'. This was a collaborative effort from all the participants, and a number of significant recommendations concerning investment emerged:

Policy statement and action plan - key guidelines on investment

- Several major resource development projects are in various stages of planning for the Northeast of Cambodia. The Royal Government is committed to ensuring that such projects do not threaten the livelihoods and the cultures of the Highland peoples. All projects, including those already signed, are required to submit management plans for public review prior to any commencement of work. These plans must include assessment of the impacts of the project on the local environment, and on local communities.....

- No development projects may proceed until the affected community groups have had notification and an opportunity to participate in the Environmental and Social Impact Assessment process.....

- All development projects and formal transfers of ownership of land in the

North-eastern provinces will require the assistance of the relevant provincial authorities through a public process.....

(Sustainable Development in Northeast Cambodia: Seminar Proceedings 1996)

In light of this draft policy, the co-ordinator of the "Natural Resources and Livelihood Study" and the chief reporter of the seminar later approached the Governor of Ratanakiri to discuss the two case studies presented at the seminar. They received permission to conduct further research concerning the oil palm concession in O Ya Dav. The Governor must be commended for sending a small government inspection team to visit Tong Krabu to investigate the situation. They adjudicated in favour of the villagers and confirmed that the company had been acting inappropriately according to the law in trying to annex village property. The company was instructed to hand the land back to the village.

In spite of the small-scale nature of this case, it is significant as it sets a precedent for the province to use their powers to prevent customary land from being taken without the permission of local villagers. It was not the intention of the villagers or the "Natural Resources and Livelihood Study" to embarrass the parties involved, but to underline the urgency of developing appropriate procedures for land claims. It is clear from the case study that the current process does not adequately protect the villagers. All parties must be made aware of the proper system; from villagers, community leaders and NGO's, to commune, district, provincial and central government staff.

D. COMMERCIAL INVESTMENT IN O YA DAV

The following discussion summarizes the findings of a research report which explored the nature of a commercial investment in O Ya Dav District. The application and consultation processes and the potential impacts on people's livelihoods were the focus of the study. A key aspect was mapping the customary lands and forest resources of the local Jarai people. This was done in collaboration with village elders and leaders who raised many concerns regarding the future security of access to lands for food production and forests for NTFP collection.

The comprehensive research findings are presented in "The Effects of Oil Palm Plantation Development on Indigenous Communities, Ratanakiri Province, Cambodia" by Sara Colm. Although written in May 1996, the detailed conclusions of the report have not yet been released for printing and distribution.

In March 1996, with permission from the provincial authorities, a multi-disciplinary research team made site visits to Son Thom, Yatung and Pok Ngay communes in O Ya Dav District of Ratanakiri to investigate the impacts of a proposed oil palm plantation. This US$20.36 million investment calls for planting 20,000 ha. of oil palm and constructing a palm oil mill in O Ya Dav. A number of concessions for industrial agriculture have been granted and this is one of the first to be approved and become operational. Hence, this investment was chosen as the subject for this study. A letter of approval from the Council of Ministers, dated September 1, 1995 stipulates that the concession area not be located in dense or degraded forest, and directs the Ministry of Agriculture to prepare a detailed contract agreement ensuring dense forest not be cleared nor timber extracted for commercial purposes.

During 1996, the company cleared 300m on either side of Highway 19 east of O Ya Dav town (300-400 ha.) According to local villagers, cleared land included semi-dense forest, secondary forest, secondary scrub (degraded forest), and cultivated and fallow swidden plots (chamkars). The concession area includes portions of six communes and could affect the agricultural lands of more than 4,500 people. Most of these are indigenous Jarai people who consider these their ancestral lands. It appears that potential problems regarding the future livelihoods of local people have not been adequately considered. At most, the oil palm plantation will provide 400 jobs for local villagers so a maximum of around 2,000 people could be provided for through employment with the oil palm company. The company does not have a clear plan for how the remaining 2,500 people living in the concession will support themselves. It is assumed that villagers who do not work for the company will continue to support themselves by swidden agriculture or paddy rice, but not on oil palm plantation land. However, this may necessitate further clearance of dense forests outside their present range of swidden cultivation.

AGRICULTURE AND FOOD SECURITY ISSUES

The oil palm plantation is a joint venture between a Malaysian company – Globaltech Sdn. Bhd. and two Cambodian companies: Mittapheap-Men Sarun and Rama Khmer International. The concession area lies just east of O Ya Dav District town and is divided into two parts: 5,000 ha. under Mittapheap-men Sarun and a second, larger area of 15,000 ha. under Rama Khmer International.

Of the 4500 people who may be affected by the oil palm concession, 95% are of the Jarai ethnic group. They practice swidden agriculture and some paddy rice cultivation rather than using a cash economy. An average family requires 6-8 hectares of land for survival, including active swidden fields, fallow fields and rice paddy. According to a 1963 study by Lafont, the Jarai have a complex law relating to land which seeks to guarantee access for all families to the necessary land for swidden cultivation as well as protecting the rights of people to lands they have improved.

In early 1995 the company recruited villagers to clear forest and agricultural land along highway 19 for a salary of approximately US$36. Much of the land was fallow swidden plots (fields abandoned for 3-10 years which residents rely on for future swidden fields). Residents in three villages said that at least 33 fields which the owners were actively cultivating had been taken by the company. These plots, averaging about 1 ha. each, are located in Beang, Pok Thom and Som Kaning villages. In most cases the owners say they were not compensated for the cost of the land but were paid only for their labour to clear the fields. The villagers felt they had no choice but to give the land away as the company said they had bought it and had documents from the Government to prove it. "So we had no heart to resist".

Several of the affected villages have large areas of rice paddy irrigated with dikes and channels. Jarai customary law considers paddy land to be very valuable (Lafont 1963). In March 1996, company representative Men Vuthney claimed that all villagers will live along the road and work for the company so there will be no need for them to farm rice. Villagers are reluctant to give up paddy land because of the large investment of labour they have put into developing the land. They are being encouraged to relocate to half-hectare (50 x 100 metre) plots along highway 19. Many villagers expressed interest in moving but most say they have no intention of abandoning their swidden plots, paddy lands or old village sites as the half-hectare sites are insufficient to support themselves. Even if people move to new plots many plan to maintain houses in both the old and the new village sites. Most of the old people would remain in the original village to make ceremonies for the ancestors. According to the beliefs of the Jarai people, the graves of ancestors must be maintained.

It is not clear whether or not villagers who move are abandoning their rights to the swidden plots, paddy fields, original village sites and forests. It is also unclear what legal title the villagers can obtain for these new plots of land. There are different interpretations as to what rights the company and the villagers have over different types of land:

Villagers interpretation – villagers say the new plots will not provide sufficient agricultural land so they are keen to continue cultivating their existing lands, possibly augmented by income from employment with the oil palm company. Most were under the impression that they were not giving up their rights to fallow, cultivated farmland or former village sites by accepting plots of land along the road.

Company interpretation - Men Sarun company representatives say the company will clear agricultural lands that are not under active cultivation, although current swidden fields can be used for the next year or so. The company does not intend to plant on old village sites out of respect for the villagers ancestral graves.

Local officials interpretation - The Head of the Ratanakiri Land Titles Department says that if any company wants concession land they cannot confiscate land or adversely affect people. He said that according to Government policy, companies must negotiate with the owners of both active and fallow swidden plots. Villagers may voluntarily sell or give their land to the company. Rights of occupancy are recognized by boundary, fence or the testimony of neighbors and District officials said that fruit trees were important in proving rights of occupancy.

ENVIRONMENTAL IMPACTS

Villagers said that to date, no old-growth forest had been cut for the plantation, only secondary or semi-dense forest. According to Ministry of Environment staff who have conducted preliminary surveys of the oil palm concession area, deforestation to clear land for the plantation could cause erosion and reduce wildlife habitat and feeding grounds. Further environmental damage and deforestation will be caused if villagers are forced to go farther into the forest to cut swidden plots because their farmland has been replaced by oil palm.

Villagers are particularly concerned that surrounding dense forests not be adversely affected by any development plans as they rely on those forests to collect rattan, honey, vines, firewood, vegetables, bamboo wildlife and other non-timber forest products.

The oil palm company's feasibility study for the proposed concession calls for the use of chemical weed control. One such chemical is paraquat which is extremely dangerous to humans if ingested, and has been banned in other countries. The possible toxic impacts of proposed herbicides on humans, livestock and water sources in the vicinity of the plantation needs to be examined carefully.

LACK OF INFORMATION ABOUT THE CONCESSION

Villagers complained that the company never consulted them. They were unaware of the company's plans until they began clearing land in early 1995. There was no negotiation with the families who were forced to give up their lands nor has any compensation been paid apart from the clearance fee. Ratanakiri Police Commissioner Kham Keun commented "From the beginning the company did everything the legal way – they went to the District and Commune and got approval. The problem was not talking with the people. Another mistake was they didn't submit their plans to the Ministry of Environment or Agriculture." However, Commune chiefs in the affected area feel that they were placed under pressure or intimidation to sign documents from the company which were not clearly explained.

Provincial, District and Commune officials – and the villagers themselves – are unclear about the exact location and size of the proposed oil palm concession area. As of March 1996, records at the Ministry of Agriculture show the concession area covering 20,000 ha. and affecting 15 villages in six communes. At that time, Ministry of Agriculture staff said that this was the most up-to-date map which has been approved and signed by the Phnom Penh Cadastral Department.

Update, May 1997 - Aside from planting about 20 ha. of oil palm in a trial plot near Som Kaning village, and 100-200 ha. of coffee, there has been little activity from the oil palm company since the clearing of 300-400 ha. land along the highway two years ago. It is possible that the company is facing financial difficulties which are making it more cautious in proceeding with the plantation. Company representative Men Vuthney has admitted that Men Sarun's foreign partners are reluctant to proceed with the project before they receive assurances that the political situation throughout the country will stabilize. In addition they are concerned about the lack of infrastructure in Ratanakiri and the expense and difficulty of importing heavy equipment across the Vietnamese border. Security is also a concern, which is why the oil palm seedling nursery is located in Phnom Penh, not Ratanakiri.

Finally, from the onset, the company has had difficulties recruiting and maintaining employees. If these issues can be worked out, the company hopes to sign a final contract with the Government this year. In 1998 the company hopes to finish a master-plan for the plantation and commence large-scale clearing and planting of oil palm. They will mostly be using heavy equipment to clear the land although they will need to hire some local people as well. In response to local concerns about village land, in early 1997 Vuthney pledged that the company would not encroach on fallow swidden plots and instead would give land to the local Jarai to farm. He said that the company expected that they would only be able to plant on half of the total 20,000 ha. concession area. While in 1997 the company's dormancy has caused local concerns to abate, it is expected that once the company resumes clear-cutting again that the problems could re-emerge with local communities, especially if land tenure issues are not addressed in the meantime.

Villager's Questions

During interviews in six villages in the concession area the following questions were raised by villagers with regard to the company's future plans:

- When will the company begin clearing land again? To where will the cleared land extend?
- When the company extends into areas people are currently using for swidden, paddy or to collect forest products, how will the company address the livelihood problems of the people?
- If villagers move along the road will old village sites be razed?
- Would the company consider a sharecropping arrangement, i.e. the people keep their own land but lease it or share products with the company?
- Can the Land Titles Department identify in writing, a clear process explaining to the people how to obtain title to lands they are currently using? What rights of tenure will villagers have to old village sites and new residential plots along the road? Can villagers be provided guidance in filling out the paperwork and financial assistance to help cover the filing fees? What about people who do not have the money to go through the application procedure?
- According to the law, can investment projects encroach on land that people are currently using, such as the 33 active chamkars that were taken by the company in Som Kaning, Beang and Pok Thom villages? What about land that is being fallowed for 1-3 years before re-cultivating? Who is responsible to compensate the villagers if land is confiscated?
- What is the company's plan to protect the environment so that surrounding forests don't disappear by the company clearing land for the plantation or by the people clearing deeper into the forest because they've been displaced from their chamkars?

On February 13th 1997, H.E. Governor Kep Chuktema, accompanied by officials from the provincial Land Titles Department, convened a meeting with commune and village leaders in O Ya Dav to address local concerns and begin to map out a strategy for addressing land titleing issues. To date, accurate maps and up-to date information about the concession have not been widely distributed to affected villagers in O Ya Dav.

Villagers Proposals

The following proposals were agreed on by a number of villagers:

- When investment companies request land, villagers propose that they consult with all the local villagers who will be affected first. Then the company, commune, village and people may be able to reach an agreement and co-operate together on development projects. If the oil palm company wants to expand it's land area it should first reach an agreement with affected villagers and communes and set a policy on how to compensate those villages.
- Villagers request that surrounding forests, old village sites, rice fields, chamkars and new village sites be reserved from development. Old village sites with ancestral graves and old- growth forest are not negotiable. It may be possible to negotiate sale or lease of chamkars and paddy land.
- Many villagers indicated they may be willing to support or collaborate with the company if they have clear information about the full extent of the company's plans and if the company is willing to consult with them. Because they now lack this information and there is no consultation, they say it is impossible for them to make decisions regarding their future livelihood or whether they may be able to work together with the company to solve livelihood issues caused by the plantation. Villagers propose that if the company takes land currently being used by the people, then it should share the production of that land with the affected villagers. If the company extends it's land, it should be very clear about what it is doing and when.

CONCLUSIONS AND RECOMMENDATIONS

The Governor of Ratanakiri endorsed the findings of the oil palm research report and copies have been distributed to key Ministries such as Agriculture, Environment and Interior. The cabinets of both the Prime Ministers have also received copies. The provincial Governor called for consultation with the company. As a result of the concerns raised, the company has already laid off the military elements within their staff who had been identified as threatening and intimidating villagers and local officials. Also the company has agreed to fund an environmental and social impact assessment to be carried out under the authority and co-ordination of the Ministry of Environment.

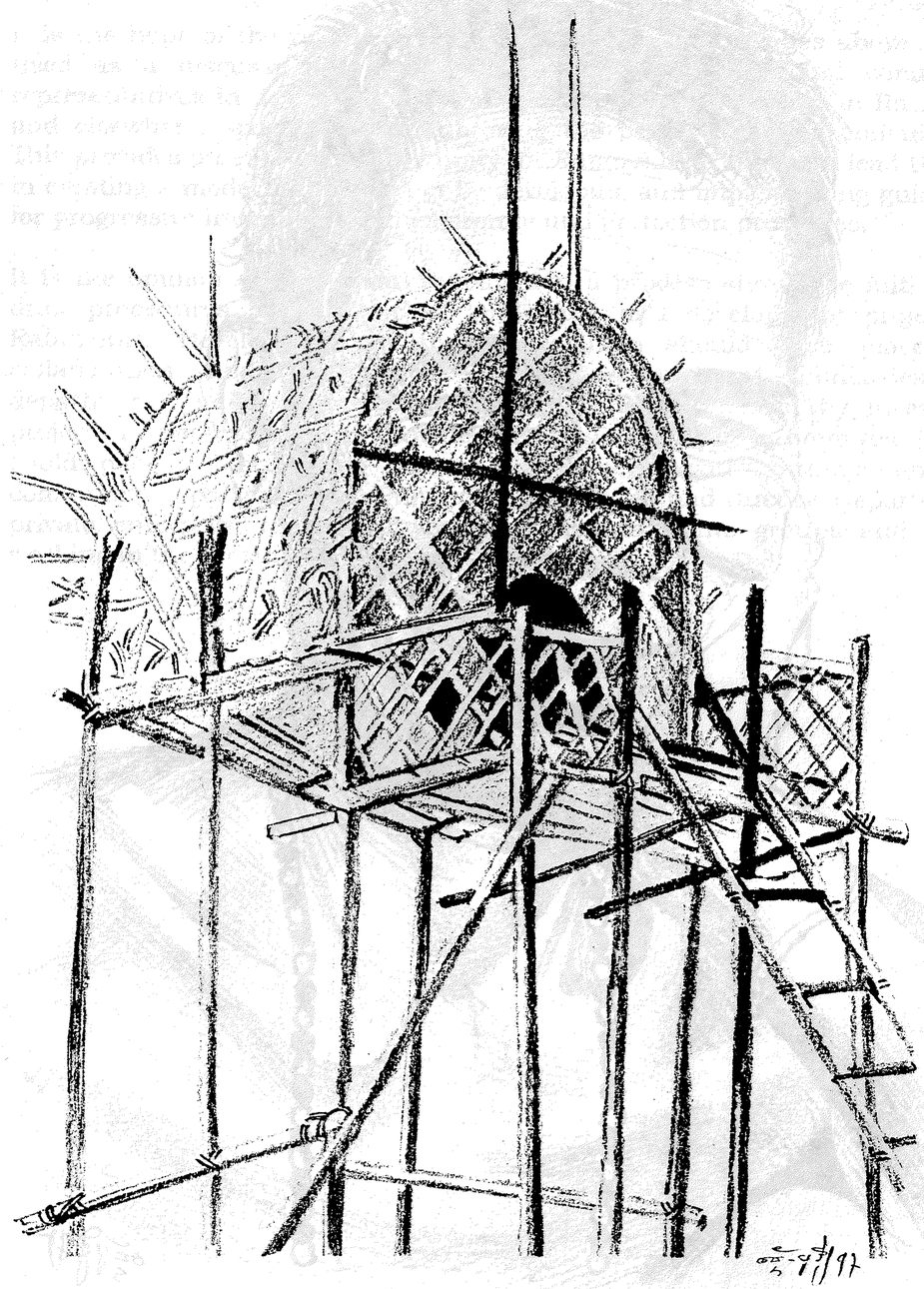
In view of the progressive moves taken by the provincial authorities, the apparent willingness of the company to respond to concerns raised, and in view of the fact that this is one of the first agriculture investment concessions to become operational in the North-east, the oil palm concession has potential to set a pro-active precedent for:

1) consultation and planning with the affected population
2) addressing land security and livelihood issues in a progressive and fair way.

It is the hope of the research team that the four land studies above can be used as a discussion point for government, investors, and community representatives in developing guidelines for future investments in Ratanakiri and elsewhere, specifically by improving the process of local consultation. This provides an excellent opportunity for Ratanakiri Province to lead the way in creating a model for the nation by developing and implementing guidelines for progressive investment and environmental protection processes.

It is the opinion of the research team that a process should be initiated to draft procedures for approval of land sales and development projects in Ratanakiri. Development of these guidelines should take place with collaboration and input from relevant government ministries and departments, and villagers who are already being affected by investment projects in Ratanakiri. The Provincial Rural Development Committee (PRDC) could play a coordinating role in this process with participation from community representatives, Provincial Land Titles and Justice Departments, private enterprise representatives, local human rights groups and NGO's working in the province.





CONCLUSIONS

The "Natural Resources and Livelihood Study" was the feasibility phase of the present Non-Timber Forest Products (NTFP) Project. This project will be funded by OXFAM (UK&I) and NOVIB until August 1999. It is the hope of the funders and the NTFP team that at the end of the three year period, this initial organization will be established as a local NGO registered in Ratanakiri province.

It is clear from the study that swidden agriculture is the most important subsistence livelihood activity of the Highlander people. The non timber forest products which supplement this system are extremely diverse in their source, use, value, availability and sustainability. The central objective of the initiative is to support and promote community-based management of natural resources and to work in partnership with Highlander villagers to improve their quality of life. The target group are rural communities whose subsistence livelihood depends to a significant degree upon forest-based activities and local natural resources.

In part, communities have been chosen which:
- are in or near areas of high ecological diversity, conservation value or watershed significance, or
- are in situations where the balance between livelihoods and natural resources is threatened due to external forces, or
- have demonstrated a willingness to manage and conserve natural resources.

The multi-disciplinary approach of NTFP Project consists of 6 teams:

1. Non Formal Education – Ratanakiri has one of the lowest literacy rates in Cambodia. Lack of literacy skills and the confidence that comes from a basic education are one of the main obstacles to villagers asserting their rights to livelihood and access to natural resources in the face of rapidly encroaching economic changes. Some skills of analysis and reflection would prove invaluable for local communities in order to make the choices necessary to adapt to rapidly changing circumstances whilst maintaining a degree of cultural integrity and asserting their rights to resources and livelihood. The objective of the program is to build up a pool of resource people from project sites through establishing an internship program. They can then be activists for health, education and internally motivated development in their own (and other) villages.

2. Agriculture – The many varieties of rice, vegetables, herbs, and tubers are crucial for maximizing food security, reducing the risk of pests and diseases, and spreading out labor inputs. The lack of chemical inputs, the forest fallowing, and the lack of tillage makes the traditional system suitable for use in watersheds. There are also a number of weaknesses;

due to lack of labor and weed invasion, most families cannot achieve subsistence in the rice staple and are forced to rely on root crops and forest tubors for up to six months of the year. In addition, traditional systems do not include and provision for soil protection on sloping land. Nor are there methods for recycling soil fertility and suppressing weeds. The low productivity, short cropping periods and cutting of secondary forests are cited as reasons why swidden fallow land should be converted to industrial crops. Introduction of simple, low-labor, low capital interventions such as contour planting or cover crops may contribute to increased production, and increased length of cropping.

3. Natural Resource Management Planning – customary management of forest, agricultural lands and water resources has been taking place for generations but without any recognition or protection of user rights by law. For this reason, investors and land speculators have few obstacles to annexing local people's land. A major objective of this unit is to document community management plans which can receive recognition under existing legal frameworks. Components include; mapping of resource use boundaries, research changes in availability of wildlife products, and involving environment and forestry officials in reviewing community management plans and negotiating changes.

4. Information and Research – the task of this team is to document data generated from the grassroots by the field work units (and other contacts). Information for advocacy, planning, training and planning will be Stored, analyzed, organized, printed and distributed.

5. The specific activities of the Forest and Agriculture-based Micro-enterprises unit and the Resource Conflict Management units will be formulated and developed in the second year of the project.

BIBLIOGRAPHY

Baird, I. & M. and Kuncungnit T. (1997) The Kavet and the Kreung: Observations of Livelihoods and Natural Resources in two Highlander Villages in the Districts of Veun Sai and Ta Veng, Ratanakiri Province
NTFP Project, Ratanakiri, Cambodia.

Baird, I. (1995) A rapid Study of Fish and Fisheries: and Livelihoods and Natural Resources Along the Sesan River.
NTFP Project, Ratanakiri, Cambodia.

Bann, C. (1996) An Economic Analysis of Non Timber Forest Products in Ratanakiri Province.
EEPSA

Colm, S. (1996) The Effects of Oil Palm Plantation Development on Indigenous Communities, Ratanakiri Province, Cambodia. Unpublished Report: NTFP Project, Ratanakiri, Cambodia.

Department of Forestry (1996) Wildlife and Livelihoods of Veun Sai, O Chum and Bo Keo Districts.
Unpublished Notes: NTFP Project, Ratanakiri, Cambodia.

Derleth, P. (1996) A Rapid Survey of Traditional Medicine in Ratanakiri Province.
Unpublished Report: NTFP Project, Ratanakiri, Cambodia.

Ken Serey, R. & Taylor-Hunt, D. (1996) Natural Resources and Livelihood in O Chum and Ta Veng Districts – A Comparison of Upland and Lowland Communities.
Unpublished Notes: NTFP Project, Ratanakiri, Cambodia.

Ker,M. & Colm, S. (1996) Sustainable Development in North-east Cambodia.
Seminar proceedings: IMC and Ministry of Rural Development.

Lafont. (1963) *Culture and livelihoods in North-east Cambodia *(title unknown)

Ministry of Environment (1996) Non Timber Forest Products and Ethno-botany of Veun Sai, O Chum and Bo Keo Districts. Unpublished Notes: NTFP Project, Ratanakiri Province, Cambodia.

Polo, Y. Ministry of Agriculture (1996) Upland Agriculture of Kreung and Tampuen People of O Chum and Bo Keo Districts. Unpublished Report.

Rayleen, R. (1995) Customary and Legal Aspects of Land Tenure Unpublished Notes: in Collaboration with NTFP Project, Ratanakiri, Cambodia.

Uch, S. Ministry of Agriculture (1996) Gender Issues in Natural Resources and Livelihood and Handicrafts; Veun Sai, O Chum and Bo Keo Districts. Unpublished Notes: NTFP Project, Ratanakiri, Cambodia.