

# Land for My Grandchildren: Land-Use and Tenure Change in Ratanakiri 1989-2007



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## Executive Summary

Like many nations in Southeast Asia, Cambodia faces challenges respecting the rights and culture of its upland dwelling ethnic minorities while pursuing national development strategies<sup>1</sup>. Centrally designed planning and economic goals have been prescribed for these remote areas often without recognizing the extraordinary knowledge indigenous communities have of their environment and the special resources they can bring to its further development. As a consequence, public and private sector initiatives for development may fit poorly, or conflict with local needs and management systems, resulting in destabilizing shifts in land-use and tenure systems as well as social systems.

Ratanakiri has approximately 250 villages with 100,000 people who live either within forests or within 5 kilometers of them<sup>2</sup>. Annual population growth of 4 to 5 percent from natural increase and migration, combined with rapidly expanding market penetration, is putting immense pressure on land and forests and fueling a large and illegal land market. As indigenous communities lose control of their lands they are forced to retreat further into the forest, clearing those areas in turn. At the current rate of forest loss it appears much of the forest in Ratanakiri will be cleared in the next decade. During the same period it is likely that half of all indigenous lands in the province will be transferred to outside investors, concessionaires, or Khmer migrants from lowland areas. The alienation of indigenous community lands is and will result in growing social and economic marginalization, while the clearing of natural forests will likely destabilize micro-climatic patterns, affect watershed hydrology, and erode biodiversity. These changes, in turn, may limit the sustainability of any new economic production systems that replace existing land-use patterns (i.e., forests and swiddens).

This paper draws on case studies from three communities in Ratanakiri to illustrate both the forces driving land-use and tenure change as well as how effective community stewardship can guide agricultural transitions. The study combines a time series of remotely sensed data from 1989 to 2006 to evaluate changes in land use, and relates this data to in-depth ground truth observations and social research from the three villages. The methodology was designed to evaluate how indigenous communities who had historically managed forest lands as communal resources, are responding to market forces and pressures from land speculators. Krala Village received support from local NGOs to strengthen community, map its land, demarcate boundaries, strengthen resource use regulations, and develop land-use plans. The two other villages, Leu Keun and Tuy, each received successively less support from outside organizations for purposes of resource mapping and virtually no support for institutional strengthening. The remote sensing data indicates that in Krala, over the sixteen year study period, protected forest areas remained virtually intact, while total forest cover declined at a rate of only 0.86 per year.

<sup>1</sup>Meyer, C. (1979) Les Nouvelles Provinces: Ratanakiri – Mondulakiri. *Revue Monde en Developement*, 28: 682-690.

<sup>2</sup>McKenney, Bruce, Yim Chea, Prom Tola, and Tom Evans. *Focusing on Cambodia's High Value Forests: Livelihoods and Management*. World Conservation Society: Phnom Penh, November 2004). p.15.

### Community Context and Deforestation Rates 1989-2006

| Village                 | Community Context   | Rate of Deforestation-<br>1989-2006 |
|-------------------------|---|-------------------------------------|
| <b>Krala Village</b>    | Strong traditional management.<br>Strong and sustained outside support                          | <b>0.86 % / year</b>                |
| <b>Leu Keun Village</b> | Moderately strong traditional government<br>Less appropriate NGO support                        | <b>1.63%/year</b>                   |
| <b>Tuy Village</b>      | Decline of community institutions<br>High market exposure An early target of<br>land alienation | <b>5.0%/year</b>                    |

While under mounting pressure, the study finds that some indigenous resource management systems operating in Ratanakiri, like those in Krala Village, have demonstrated a capacity to achieve national goals for sustainable use and forest conservation. These systems respond well to support that is directed towards building local forest management initiatives and supporting traditional communal tenure. The study also indicates that indigenous families are under tremendous pressure to illegally sell community forests and are often manipulated by local officials. Indigenous community forestry presents an opportunity for the Royal Government of Cambodia (RGC) to retain high value natural forests in Ratanakiri, if government, NGOs and donors can find ways to effectively support traditional forest stewardship systems. Such a strategy would support the RGC's achievement of national forest cover goals while responding to social needs of the province's predominantly rural population.



## Acknowledgements

The authors would like to thank the people of Krala, Leu Khun and Tuy Villages for their support in helping us to understand how their world is changing. Without their honest descriptions of how land-use and resource control is being transformed, we would not have been able to interpret the remotely sensed images or gain a clearer picture of the implications for the indigenous people of the region. A special debt of gratitude is owed to Hoeung Koeun, of the provincial Department of women's affairs, for her extensive knowledge of indigenous languages and cultures, and her patient and diligent assistance in collecting the extensive social data required for completing this study.

We would also like to express our gratitude to the local NGO staff and government officials who greatly contributed to the study. The staff of the provincial Department of land was particularly helpful in providing valuable data on previous land-use mapping activities in the study communities. Special mention should also be given to Non-Timber Forest Project (NTFP) for sharing their experiences, as well as to the staff of the Ratanakiri Natural Resources Management Network (RNRMN), the Highlanders Association, and the Indigenous Communities Support Organization (ICSO).

Special thanks are also due to Graeme Brown and Jeremy Ironside who have worked for years to understand the complexities of change in Ratanakiri and generously contributed their ideas and experience to the project. Thanks are also due to the researchers who have studied the Northeast over the past decade and helped to inform this report. The authors are also grateful to CFI-Cambodia staff, especially Amanda Bradley for her thoughtful input into the development of this project, as well as to Heng Santha for his work on the study maps and his artistic lay out of the report.

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## Introduction

### Objectives of the Research

Over the past decade, Ratanakiri Province has experienced unprecedented changes in land use and tenure. This study analyzes remotely sensed images taken in 1989 and December 2006 to assess changes in vegetative cover in three areas near Ban Lung the provincial capital, and draws on in-depth case studies from three communities in the research area. The researchers were particularly interested in how forest cover changed over the seventeen year period, and what replaced it. We sought explanations for changes in land and forest management practices in social, economic, and demographic factors. Since all study communities and their surrounding land and forests were traditionally under similar forms of indigenous resource management characterized by swidden farming, we wanted to understand how these human ecosystems were adapting, or not adapting, to agricultural commercialization and the influx of migrants and investors in the region, as well as an annual population growth of over 4 percent.

Aside from land-use transitions, the study assesses how land and forest control and tenure arrangements are changing. In spite of prohibitions against the sale of indigenous lands provided within the 2001 Land Law, alienation of indigenous lands, both through sales and intimidation is occurring at an increasing rate throughout the province. Due to a lack of transparency within the Cambodian government structure, and a lack of established and functional procedures for land titling and transfer, the actual extent of tribal land loss within many communities remains unclear. As such, we have a poor understanding of the scale and impacts these changes have on the lives of community members.

The report is intended to contribute to the following objectives:

- To illuminate changes taking place in land use, forest cover, and resource control;
- To identify forces that are driving changes in land use and tenure, especially forest conversion and indigenous land alienation;
- To identify and evaluate forces constraining change, particularly the effectiveness of participatory land-use planning (PLUP) processes in providing more rational land cover change and stabilizing indigenous land rights;
- To assess the social, economic, and environmental impacts of land and tenure changes in Ratanakiri, as well as their implications for the future;
- To provide recommendations to government policy makers and planners, as well the donor community, regarding strategic options to address land and forest problems affecting indigenous communities in Cambodia.

### Research Methodologies

The research was conducted in 2007 as a collaboration between Community Forestry International (CFI) and the East-West Center (EWC). CFI has been supporting community networking in the province since 2003, while EWC researchers have been engaged in studying the area for over a decade. The concept of the methodology was to analyze a time series of satellite images to identify changes in land cover, and to conduct in-depth studies with communities, to understand why changes in land use and tenure are occurring and to assess the social implications of these changes. For this reason, a multi-disciplinary team was formed with the methods of each task group described below:

### ***Social Data and Analysis***

To understand both the nature and extent of land-use and tenure changes, a series of focus group and individual interviews were conducted in each of three villages representing varying degrees of land-use and land tenure change. The selection of villages was based on anecdotal evidence and reports from NGO members working throughout the province. Data for this report was collected during two field visits to the selected villages during the first half of 2007. The first visit was conducted in January 2007, and comprised focus group discussions with community members in each of the three villages, followed by individual interviews with two to three selected individuals from each community. The focus group discussions were designed to identify overall community attitudes and practices surrounding land management decision-making, and broad patterns of land use within the community. The discussions also aimed at revealing areas of conflict surrounding land and natural resources, and at assessing the status of communal land tenure as reflected in incidence of land sales, land grabbing, and efforts by the community to preserve their lands. Additional effort was made to identify changes over time in social conditions and economic/food security status that might serve as a metric in measuring the social impact of observed changes in land use and tenure.



*Visiting the site of a disputed village boundary with members of Leu Khun village.*

Individual interviews were conducted to provide concrete examples of individual practices surrounding land use, and to identify the actual prevailing conditions and procedures by which land is either converted to other uses or transferred to new owners. These interviews were also aimed at gauging the family's economic status and possible impacts of their particular changes in use or availability of resources. A second field visit was conducted in April, 2007, as a means to both clarify data from the first visit, and to collect additional geospatial data surrounding changes in land use. Sketch mapping was conducted in Leu Khun village to identify patterns of land use, and areas of current and ongoing land conflict. Sketch mapping was also conducted in Tuy village to identify changes in land use as an overlay to earlier land-use planning maps created in 2003 and 2004. Some additional information used in this report was derived from interviews with government officials from the Department of Land, and NGO workers from several organizations with experience working in the study communities. Among those NGOs consulted in the making of this report were the Non-Timber Forest Project (NTFP), the Highlander Association (HA) and the Indigenous Community Support Organization (ICSO).

### ***Remote Sensing Data and Land Cover Change Analysis***

In order to assess the spatial patterns of land cover and land use (LCLU) change in the three villages, remotely sensed satellite image data, ground truth information, and derived land cover products were analyzed with emphasis on changes occurring in the 17-year period between early 1989 and late 2006.



Baseline land cover for the three villages was derived from a Landsat Thematic Mapper image acquired 08 January 1989 and obtained from NASA's Global Orthorectified Landsat Data Set<sup>3</sup>. More recent land cover was derived from an Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) satellite image acquired on 25 December 2006 and obtained from the NASA/USGS Land Processes Distributed Active Archive Center (LPDAAC). A 13-class GeoCover land cover map product was obtained from MDA Federal (www.mdafederal.com) for the 08 January 1989 Landsat image as an independent land cover data source. Additional ground truth data sources included 1:50,000 scale scanned topographic maps, an IKONOS 1-meter resolution panchromatic image acquired 29 December 2001 for Krala village and surrounding area, and 243 GPS ground truth data points obtained during field work in January of 2006 and 2007. Using the orthorectified Landsat TM as a georeferencing source, all imagery and raster datasets were rectified to the UTM coordinate system, WGS84 datum, and units of meters. In addition, official land-use planning maps were obtained for each village



Reviewing satellite images of village lands with members of Krala village.

from the provincial land office in Ban Lung. The planning map for Krala was finalized in 2006, and completed in 2005 and 2004 for Leu Khun and Tuy villages, respectively. These maps were co-registered to the georeferenced datasets above, and village boundaries and designated land-use planning boundaries were digitized and added to the GIS database.

Remote sensing image analysis involved a combination of unsupervised and supervised classification approaches. First, given the limited amount of ground reference data from 1989 for the study region, an unsuper-

vised classification using a maximum likelihood algorithm was performed on the 1989 Landsat image using ERDAS Imagine image processing software and resulting in 50 separated spectral clusters. In addition to the six visible and near-infrared bands of the Landsat scene used in the unsupervised classification, a normalized difference vegetation index (NDVI) enhancement was generated as a separate map in order to distinguish relative differences in standing green vegetation biomass throughout the study region. Using knowledge of the study area, available ground references, and the NDVI map, clusters were assigned to one of ten land cover classes, including deciduous forest, evergreen forest, shrub/scrub, grass, barren, settlement, non-paddy agriculture, paddy, wetland, and water.

Analysis of the 2006 ASTER image involved first generating an NDVI enhancement map from the 15 meter resolution red and near-infrared image bands (ASTER image bandwidths for bands 1-4 are comparable spectrally to Landsat bands 2-5). Image-to-image radiometric calibration was performed to allow comparison between sensor data. An image-pair comparison of the 1989 NDVI and 2006 NDVI was performed in order to readily identify and map areas of significant change (and little change) in biomass between the two dates.

<sup>3</sup>Tucker, C.J., Grant, D.M., and Dykstra, J.D., 2004. NASA's Global Orthorectified Landsat Data Set, Photogrammetric Engineering and Remote Sensing, 70(3): 313-322.

By creating two-date NDVI composite images, areas with significant changes in biomass between dates (e.g., due to clearing land, clearing land followed by regrowth of natural vegetation or agriculture, or maturity of younger vegetation in the 1989 image to mature vegetation in 2006) are evident (appear bright red in composite displays). For those areas of relatively little or no change in NDVI, an initial assumption was made that the basic land cover had remained relatively stable.

This was further verified using visual interpretation of the higher resolution ASTER bands, consulting ground truth GPS field data and photos, and village land-use planning maps, and, in the case of Krala, visual inspection of the 1 meter IKONOS panchromatic image. For the areas (and associated pixels) of relatively little or no change, the land cover information class from 1989 was carried forward to the 2006 land cover map. Areas exhibiting changes in biomass between the two dates were isolated for further spectral analysis using a supervised classification approach. Using available reference data, including 2006 and 2007 GPS field data, spectral training sets were created for each of the ten land cover classes mentioned above. A supervised classification was then implemented using a maximum likelihood classifier and the resulting clusters were evaluated for separability and further split or aggregated until a final classification map was produced.

Final class maps for both 1989 and 2006 dates were smoothed using a 3 x 3 majority filter to remove inherent speckle in the underlying satellite data. For comparison of classification maps between dates and across the three villages, the classification scheme was further simplified (and classes aggregated) into seven classes, including forest (deciduous and primarily evergreen), young fallow and immature cashews (includes shrub/scrub and grass), non-paddy agriculture, paddy, settlement, wetland, and water. Finally, land-cover class area and percent cover statistics from 1989 and 2006 class maps were calculated, summarized and compared by village area and also by the specific land-use planning zones demarcated for each village. This allowed for assessing overall village land cover change and also in analyzing the extent to which each village managed its land according to its respective participatory land-use plan.

## Organization of the Report

This report begins with a brief description of the historical, social and cultural context of Ratanakiri and the study communities. In Part 2 we describe important changes in land use that have occurred in the three villages studied, based both on the analysis of satellite imagery from 1989 and 2006, as well as reports of community members. Land tenure changes occurring during the same period are discussed in Part 3, relying on reports from community leaders, village respondents, NGO field staff members, local government officials, and other resource persons. Part 4 describes how variations in participatory land-use planning practices have influenced land-use and tenure change in the three indigenous communities. Part 5 examines the extent to which village and commune leadership, community policies, and sanctions were able to guide land-use decisions and prevent land alienation. Finally, Part 6 suggests several future scenarios for land-use change in the three study villages including retaining traditional agro-ecosystems, shifting to a predominantly plantation economy, conserving landscape under protected area systems, and a variety of small holder agro-ecosystems. The report concludes with possible policy and programmatic actions that could reduce problems of social marginalization and deforestation, and promote improved land-use planning and tenure stability.

To better contextualize the remote sensing data and to gain insight into complex land-use and tenure changes occurring in Ratanakiri, the social research included the compilation of seven in-depth interviews (see Boxes) reflecting the socio-economic, cultural, and environmental forces shaping the lives of indigenous peoples.



## Part 1 Ratanakiri Land-Use History and Context

### Overview of Indigenous Highlander Communities

The communities observed in this report each represent a distinct ethnic group with its own language, customs and traditions. People of Kreung, Jarai and Tampouen ethnicity populate the three communities studied and are among twelve ethnic groups found within the northeastern highland region of Cambodia. These groups, referred to collectively as “Highlanders” or “Hilltribes,” are largely believed to share a common ancestry with the lowland Khmers. Chandler (1993) suggested that this divergence occurred as early as the 3<sup>rd</sup> Century AD.

Individual Highlander communities are distinguishable from each other in numerous ways, including language, dress, architecture, and village organization. For example, Kreung villages are generally constructed in a circular fashion, whereby the larger family houses defined the outer perimeter of the settlement, facing inward toward a large central community meeting house. The Jarai, however, appear to be less community focused, and more family oriented as reflected by the construction of expensive “long houses” that house large extended families. These longhouses are internally separated to house individual family units within the larger extended family. The Tampouen, tend to vary considerably in the physical layout of the village and social organization, and have been observed to adopt organizational patterns similar to either the Kreung or Jarai, depending on which of those other communities are closest.

### Traditional Tenure

The ethnic communities of Ratanakiri organize themselves in self-governing villages with strong social cohesion provided both through kinship ties as well as each families sense of membership in the village, often linked to a belief in the spirits of their village. Among all groups, family elders are leaders held in great respect. They also play an important role in orchestrating land-use decision making. Their knowledge of customary



Recent burial sites within sacred burial forests in Krala village

law is of special importance for land and resource use, including their ability to deal with the power of the spirits of the forest, lands and waters. Customary law governs, informed by the elders, and guides community decisions regarding the clearing of forests for agriculture. According to customary law, the family has use rights over the land that they currently cultivate and over produce from old plots that are fallowed, but may be farmed at a later date<sup>4</sup>. It is particularly important to note that customary law dictates that land use and control is generally passed along the

female lineage. Under this system, the male will generally move in with the family of the bride, and will ultimately rely on the land and resources of that family for future cultivation.

<sup>4</sup>Graeme Brown, Jeremy Ironside, Mark Poffenberger, and Alistair Stephens. *Formalizing Community Forestry in Ratanakiri Province, Cambodia: Linking Indigenous Resource Systems to Government Policies and Programs* (CFI: Phnom Penh, Cambodia, 2007).



Highlander communities also share many striking similarities in their traditional beliefs, customs and most notably their relationship to the forests and land. Family elders are relied upon to preside over ceremonies, conduct ritual sacrifices, and often to mediate and resolve conflict within and between families. Historical reports indicate that the indigenous communities of Ratanakiri are not nomadic, but rather have resided in the region for generations. A late 19<sup>th</sup> century explorer traveling in Northwest Cambodia noted:

Nowhere have I found any (highlanders) that are at all nomadic, as they are generally believed to be...As a consequence of secular fighting, the inhabitable territory has been divided up between the villages...Simple verbal agreements and traditions limited the public domain...The smallest incursion into neighboring territory brings about a conflict because nothing safeguards collection property among them<sup>5</sup>.

The close association with the land and the natural environment is reflected in the spiritual beliefs of each group wherein the entire world is populated by spiritual forces associated with distinct components of the natural environment, such as trees, hills, stones, and water.

### **Traditional Land-Use Systems**

The entire highland way of life is inextricably linked to the forests and lands that surround, protect, house and feed the communities. Perhaps most notable with regard to their relation to the forest and the land is the swidden agriculture technique and the practice of upland rice cultivation which is common to all highland cultures. In this system, individual farmers clear a patch of re-growth forest for farming, where they will grow largely upland rice and some secondary crops like tubers, corn and vegetables. They will grow upland rice (which can be planted and cultivated without tillage or major soil disturbance) from 2 to 5 years, at which time they will leave the land for fallow and begin clearing and farming a new patch of re-growth forest. During the fallow period, they will continue to harvest fruit and other wild vegetables that the fields continue to produce. While the swidden system of agriculture has been criticized as being inefficient and environmentally damaging, many researchers have shown that this practice has been highly sustainable, owing to low population densities and long fallow periods which allow substantial regeneration of the forest.

The hill tribe communities have sophisticated knowledge of local ecosystems and traditionally manage highly complex farming systems. Brao-Kavet people in Kok Lak District are reported to cultivate 181 different crops in their swiddens, including 36 varieties of rice and 145 perennial and annual crops. A family swidden plot may include 3 to 7 varieties of rice and 60 to 100 other food species.



Tampuen farmer in his recently cleared agricultural land within an area designated as protection forest, Tuy village.

<sup>5</sup>Cupet (1891) in Ironside, Jeremy and Ian G. Baird (2003) *Wilderness and Cultural Landscape: Settlement, Agriculture, and Land and Resource Tenure in and adjacent to Virachey National Park, Northeast Cambodia*. (BPAMP/DNCP-MOE: Phnom Penh, Cambodia). p.52



Brao-Kavet people also recognize over 100 “habitat” types, including wetlands, agricultural lands, and a wide range of forest types. Forests that comprise a swidden system represent a range of age classes based on length of fallow. Forest classifications in the Brao-Kavet system include six stages of natural regeneration from new fallows to old forests with very large trees<sup>6</sup>.

### **Indigenous Forest Conservation**

The protection and preservation of forest areas is also a practice that has been shared throughout the indigenous communities, resulting in abundant forest being present in areas claimed by indigenous people. Customary law has traditionally prohibited cutting of trees in the immediate vicinity of village habitation areas, thus providing protection, shade and a proximal supply of non-timber forest products. Other areas that have been traditionally protected against timber cutting include spirit forests (areas that the spirits have deemed “off limits”) and burial forests. Given these various areas of protection, and the intermittent use of secondary forests for agriculture purposes, indigenous communities have occupied and used the land in a way that has had minimal impact on the overall ecosystem.

Like all of other people of Cambodia, the lives of the highland people were tragically disrupted by the Khmer Rouge regime, which forcibly relocated many highland communities to lowland areas and forced the people to grow lowland rice. Many others escaped to live in the forests. During this period, traditional forms of dress and jewelry, as well as sacrifices and other religious activities were outlawed. For most highland peoples, the traditional style of clothing and jewelry appear to have been abandoned.

Almost immediately upon the arrival of the Vietnamese army and the subsequent fall of the Khmer Rouge central government, most Highland people returned to the sites of their original villages and rebuilt their homes and lives at or near the original location. While many highland areas have limited availability of paddy land, those with suitable land brought the practice of growing paddy rice, which they learned during their internment, back to their ancestral villages.



### **Case Study Contexts**

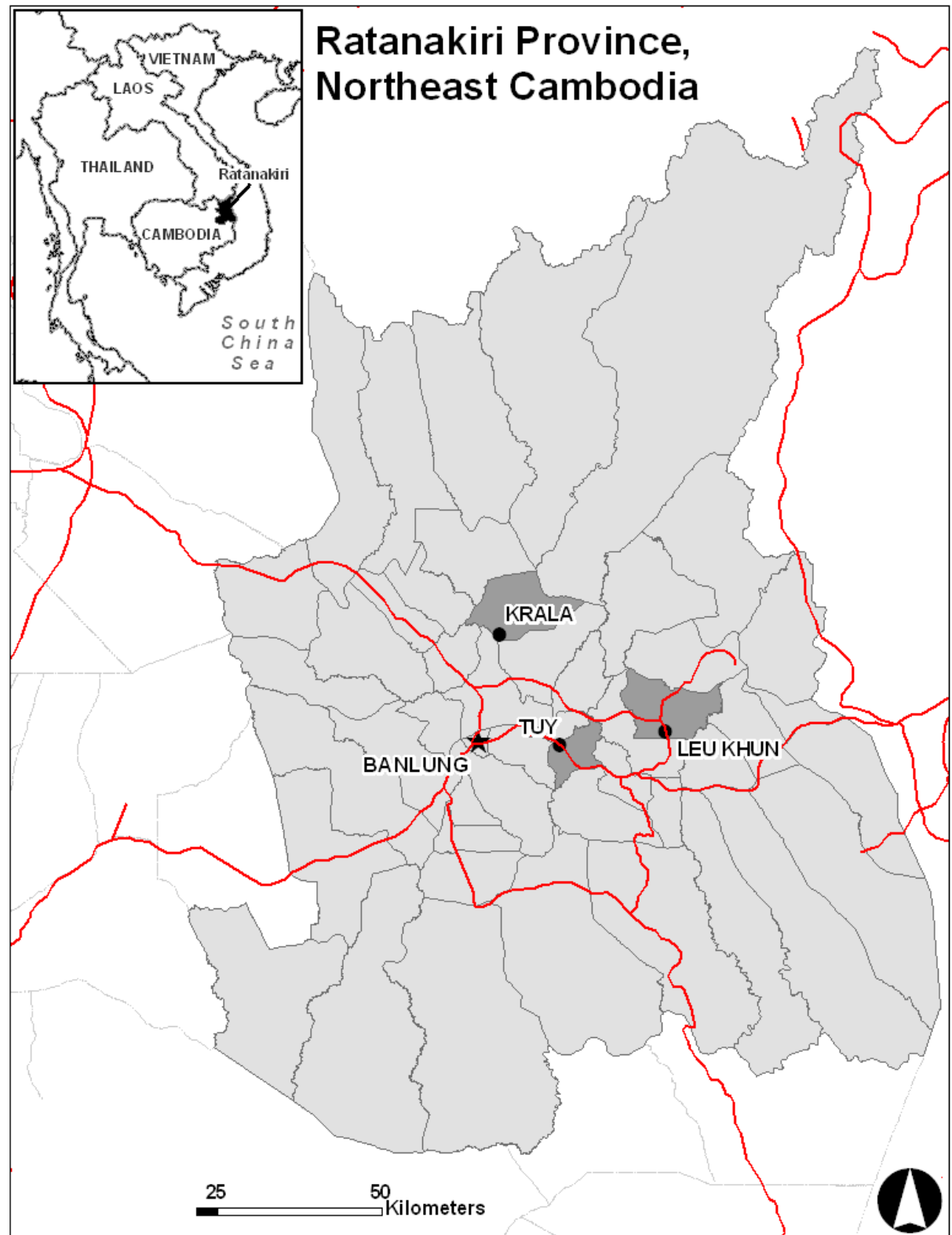
This study selected three communities that experienced different patterns of land-use and tenure change over the past 16 years (1989 to 2006) in order to explore how such factors as proximity to roads and markets, community and local government leadership, and land-use planning influenced the rate and nature of change. To understand both the nature and extent of these changes, a series of focus group and individual interviews were conducted in each of three villages representing varying degrees of land-use and land tenure change.

The selection of villages was based on anecdotal evidence and reports from NGO members working throughout the province (see Map 1 and Table 1):

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<sup>6</sup>Baird, Ian, G. (2000) *The Ethnoecology, Land-Use, and Livelihoods of the Brao-Kavet Indigenous Peoples in Kok Lak Commune, Voen Say District, Ratanakiri Province, Northeast Cambodia*. (Ban Lung: NTFP, April 15.) pp.20-30.

Map 1: Community Research Sites in Ratanakiri





For the purposes of this report, the following three villages were selected to present a continuum from least to most change during the past ten years (Table 1):

**Table 1: Characteristics of Community Research Areas**

| Event   | Tuy Village, Ting Chac Commune, Bar Kaev District | Leu Khun Village, Ke Chong Commune, Bar Kaev District | Krala Village, Poey Commune, Ou Chum District |
|---|---|---|---|
| Extent of Land Tenure Change                                  | Moderate to High                                  | Accelerating  | Little to None                                |
| Rate of Land-Use Change                                       | High  | Moderate  | Moderate                                      |
| Village re-settled (after KR)<br>Population 1979-1984<br>2007 | 1982<br><br>210 people<br>458 people              | 1979<br><br>250 people<br>639 people                  | 1984<br><br>235 people<br>420 people          |
| Ethnic Group  | Tampouen  | Jarai   | Kreung  |
| Estimated % of Village Land acquired or taken by Outsiders    | 50%   | 10-20%  | 0%  |

### ***Tuy***

Tuy is a predominantly Tampouen village located along the main road (Road 78) between the provincial capital of Banlung and the Vietnamese border, approximately 20 km east of Banlung. The research team selected Tuy to represent “high land use and tenure change,” based on reports that extensive land sales were taking place in the village and the surrounding communities. While the village has existed in its present location for many generations, the entire community was forced off their land in order to work lowland rice areas during the Khmer Rouge period. In 1982 approximately 85 families returned to resettle the village. By 2005, the population had grown to 103 families (458 people), at which time 23 of the families chose to break away in order to form a new village (Trang Village) as a result of internal conflicts between two community leaders.

Tuy’s forests were logged extensively from 1985 to 1989 by Vietnamese companies, and later by the Cambodian military from 1990 to 1993. Since 2000, Tuy has seen significant changes not only in land use, but also in land tenure with estimations of more than half of the community’s productive land having been acquired by outsiders. People in Tuy increasingly see land and forests as market commodities and indigenous institutions as having diminished ability to guide community policies and behavior.

### ***Leu Khun***

Leu Khun is a Jarai village that was re-established in 1979, when community members returned from lowland areas where the Khmer Rouge had forced them to relocate.

At that time there were seventy families who resettled the village, with a total population of 250. The population has since grown gradually to 130 families with 639 people. From 1986 to 1992, Vietnamese logging companies felled much of the larger, old growth forests surrounding Leu Khun. Much of the remaining forest was felled by the Cambodian military throughout the 1990s, ending around 2002. Smaller-scale illegal felling continues. Leu Khun represents an established indigenous community that is coming under growing pressure from land speculators and where land-use change is accelerating. Community members are uncertain how to address these problems, as village leadership is unable to deal with land speculators and corrupt officials, and some villagers see opportunities to generate cash through land sales.

### **Krala**

Krala is a Kreung village of about 420 people in O'Chum District, located about 25 km north of Ban Lung. Krala was re-established immediately following the fall of the Khmer Rouge, and the current settlement area of the village was established at its present site in 1984. During the Khmer Rouge regime much of the community's population were relocated to Voensai District where they were forced to farm paddy rice.

Unlike many of the indigenous communities adjacent to major roads in the province (although the Voensai road has been a target of less change than the highway to Vietnam), Krala has managed to maintain control over 100 percent of its traditional land, and stands as a model for other communities who are facing a similar struggle. While the ownership of Krala's traditional land has not changed, the use of their land has seen a significant transition from entirely swidden agriculture in the early 1990s to the cur-

rent mosaic of swidden fields and cashew plantations. In 1994, only four families in the village had planted cashew trees, but by 2000, nearly 100 of the 135 families in the village had planted cashews on their land. Now, it is estimated that every family in the village has at least 0.5 ha of cashew trees.

Krala has been the focus of several prior research studies that have resulted in a considerable amount of NGO attention and support in the village. It was selected to represent the community with the least amount of change (at least with regard to tenure) as well as a community

where indigenous community institutions remain in control of communal lands, with support from local NGOs.



Community meeting house in Krala village.

These communities provide insights into the experiences indigenous villages are having as they confront the outside world and its market driven economy. Krala, with the least outside pressure and most support at strategic times, has been able to hold on to its culture and institutions more effectively, using its strengths to stabilize the community, while taking advantage of new cash cropping opportunities. Leu Khun, under greater pressure and without adequate support, is reacting to the same changes, but its indigenous leaders and institutions are having greater difficulties formulating community-based natural resource management policies to guide land-use and tenure transitions.



Tuy has simply been swept away by more powerful political and economic forces and it is foreseeable that it will gradually lose its identity as a Tampouen community. Part 2 describes some of the changes in land use and tenure that these villages have experienced from 1989 to 2006, based on remote sensing data and in-depth interviews.



Inside the Krala village meeting hall

## Part 2 Changing Landscape - 1989 to 2007

Rapid changes in vegetative cover have taken place in Ratanakiri Province over the past two decades. Until the mid 1970s, aside from some small rubber plantations, most land area was covered by a mosaic of secondary forest fallow with small swidden plots interspersed. These indigenous farming systems were disrupted during the Khmer Rouge Period when families were resettled (1970-1979) in lowland communities. Upon returning some villagers began developing paddy cultivation areas while most returned to their swidden practices. The Vietnamese who governed Cambodia during that period (1979-1985) began commercially logging the province's forests. Population growth through natural increase and immigration, and expanding market access accelerated forest conversion, both for new commercial crops like cashews and rubber, as well as for more traditional rain-fed cultivation.

While this study mainly examined the impact of small-scale land sales in the three research communities, larger Economic Land Concessions (ELCs) are also being contracted in many parts of the province. These and more concessions are bound to have a profound and additional effect on indigenous peoples' lives.

A UN study concludes that:

*The alienation of indigenous land through the granting of economic land and other concessions is undermining the ability of indigenous communities to register their collective ownership of traditional lands, and enforce their rights to land under the Land Law. In the face of the continuing alienation of land in indigenous areas, there is increasing concern that little land will remain available for registration once the framework for registration of indigenous communities and collective land title is finalized.*

The following section explores how non-ELC land use is changing in Ratanakiri at an accelerating rate and examines some of the forces shaping these patterns.



### Land-Use Change in the Three Study Villages

Table 2 shows changes in land cover and population in the three villages between 1989 and 2006. In 1989 villagers in Krala had access to approximately 11 ha of forests per person. By 2006 this had dropped to 5 ha per person. This represented a loss of approximately 13% of the forest cover (almost all forest cover in this region is composed of broadleaf evergreen species). Most of this forest cover was converted to various types of agriculture including cashews and other cash crops. Permanent agricultural land cover grew by a rate of approximately 15% per year during this period.

In 1989 villagers in Leu Khun had access to less forest land (3 ha per person) than villagers in Krala had in 2006 (5 ha per person). Between 1989 and 2006 villagers in Leu Khun lost approximately 16% of their forest cover resulting in approximately 1 ha per person in 2006. Permanent agricultural cover increased during this period by 421 ha or 8% per year.

In Tuy we see a loss of almost 45% of forest cover and an increase in agricultural cover of approximately 54%. In 2006, however, villagers in Tuy had access to twice as much permanent agricultural land per person as villagers in both Krala and Leu Khun (2 ha as opposed to approximately 1 ha per person).



Participatory land-use planning (PLUP) and small scale land-use mapping began in Ratanakiri in 1996-97 and a GIS Unit designed to support community land mapping was established in Ban Lung in 2000. The GIS Unit assisted villagers to draw sketch maps of their current land and to develop PLUP maps that represent an effort by development workers, local government officials, and community leaders to clarify territorial boundaries and to develop coherent zones of land-use activities. When we overlay the PLUP maps with the remotely sensed images we can observe how well land-use practices conform to village land-use zoning objectives. The effectiveness of PLUP activities is explored further in Part 4.

Table 3 summarizes land-use zoning and land cover in Krala in 1989 and 2006. Villagers in Krala sought to protect 35 percent of their land base as protected forest. The remotely sensed images suggest that the villagers successfully achieved this goal (Map 2). The areas villagers zoned to use for both swidden and permanent agriculture have seen the most change during this period although a large majority of this area still remains forested (Map 3).

The most pronounced change in land use in Krala was the expansion of cashew trees from just a few ha in 1994 to an estimated 500 ha in 2007. Villagers consider planting cashew to be an easy task as they can be planted in June along with rice. The trees become fully established within the course of the rainy season and are able to grow without irrigation or fencing. Villagers report that they do not need to be fertilized and that they do not have any problems with pests. Most farmers plant the field with both upland rice and cashew trees and continue to intercrop rice with the cashews for three-to-four years until the trees become mature and begin yielding nuts.



A mature cashew grove along the road in Krala village. Some farmers clear the understory of vegetation for ease in cashew harvesting.

CIDSE (now DPA) assisted villagers in Krala in developing their cashew cultivation, often providing seeds to farmers, as well as some training in the practices of cultivation. CIDSE also assisted a number of village families to establish mango trees. Today, as people continue to plant cashews and other fruit trees, they purchase their seeds either in Banlung or from others in the community.

Table 2: Changes in land cover and population in the three villages: 1989 and 2006

| Village/Year                               |                                    | Krala  |       | Leu Khun |      | Tuy    |      |
|--|------------------------------------|--------|-------|----------|------|--------|------|
| Land cover as mapped                       |                                    | 1989   | 2006  | 1989     | 2006 | 1989   | 2006 |
| Forest                                     | Ha                                 | 2,479  | 2,142 | 1,034    | 782  | 1,143  | 488  |
|  | % of land cover                    | 94     | 81    | 65       | 49   | 79     | 34   |
|  | Ha lost/year                       | 20     |       | 15       |      | 39     |      |
|  | Annual rate of change (%)          | -0.86% |       | -1.63%   |      | -4.88% |      |
|  | Years left under current loss rate | 108    |       | 53       |      | 12     |      |
|  | Ha/person                          | 11     | 5     | 3        | 1    | 5      | 1    |
| Young fallow and immature cashews          | Ha                                 | 129    | 112   | 408      | 216  | 236    | 72   |
|  | % of land cover                    | 5      | 4     | 26       | 14   | 16     | 5    |
|  | Annual rate of change (%)          | -0.83  |       | -3.67    |      | -6.75  |      |
|  | Ha/person                          | 0.5    | 0.25  | 1        | 0.34 | 1      | 0.16 |
| Agriculture (permanent, cashews and paddy) | Ha                                 | 38     | 386   | 153      | 574  | 53     | 854  |
|  | % of land cover                    | 1      | 15    | 9        | 36   | 4      | 59   |
|  | Annual rate of change (%)          | 14.61% |       | 8.09%    |      | 17.76% |      |
|  | Ha/person                          | 0.16   | 0.86  | 0.5      | 0.9  | 0.25   | 2    |
| Other (water and settlements)              | Ha                                 | 0      | 6     | 0        | 24   | 12     | 30   |
|  | % of land cover                    | 0      | <1    | 0        | 1    | 1      | 2    |
|  | Annual rate of change (%)          | 45.69% |       | 58.07%   |      | 5.54%  |      |
|  | Ha/person                          | 0      | 0.01  | 0        | 0.04 | 0.06   | 0.06 |
| Population                                 | Total population                   | 235    | 450   | 320      | 639  | 210    | 458  |
|  | Annual rate of change (%)          | 3.9%   |       | 4.15%    |      | 4.69%  |      |
|  | People/km <sup>2</sup>             | 9      | 17    | 20       | 40   | 15     | 32   |



Table 3: Land-use zoning and land cover in Krala: 1989 and 2006

| Land cover as mapped<br><br>Land use as zoned |   | % Krala PLUP | 1989     |  |                                     |                             | 2006          |   |  |                                  |
|---|---|--------------|----------|--|-------------------------------------|-----------------------------|---------------|---|--|----------------------------------|
|   |   |              | % Forest | % Agriculture (permanent, cashews and paddy) | % Young fallow and immature cashews | % Other (water, settlement) | % Forest 2006 | % Agriculture (permanent, cashews and paddy) 2006 | % Young fallow and immature cashews 2006 | % Other (water, settlement) 2006 |
| Participatory Land-Use Planning               | Protected Forest (and bamboo, spirit, others)       | 35           | 34       | <1   | 1                                   | 0                           | 34            | <1  | <1                                       | <1                               |
|   | Mixed-use (trees and swidden)                       | 36           | 33       | 1  | 2                                   | 0                           | 28            | 6   | 2  | <1                               |
|   | Agriculture (cashews, private, barren, paddy, etc.) | 28           | 26       | <1   | 2                                   | 0                           | 19            | 8   | 1  | 0                                |
|   | Other (settlements, wetlands)                       | 1            | 1        | 0  | <1                                  | 0                           | 1             | <1  | 0  | <1                               |

The practice of cashew cultivation within the community has spread largely through social networks or peer learning. Individuals watch or participate in the planting of cashews in the field of a friend or family member and then apply those same techniques within their own fields. They describe a strong sense of cooperation and willingness to assist others in growing cashew and do not perceive any sense of competition or threat from others entering the market.

Villagers do not generally collaborate in the harvesting, transporting, and bargaining or selling of the nuts. Each family harvests and sells their nuts individually, sometimes swapping labor during the harvesting activities, but without any consolidation of product or collective bargaining.

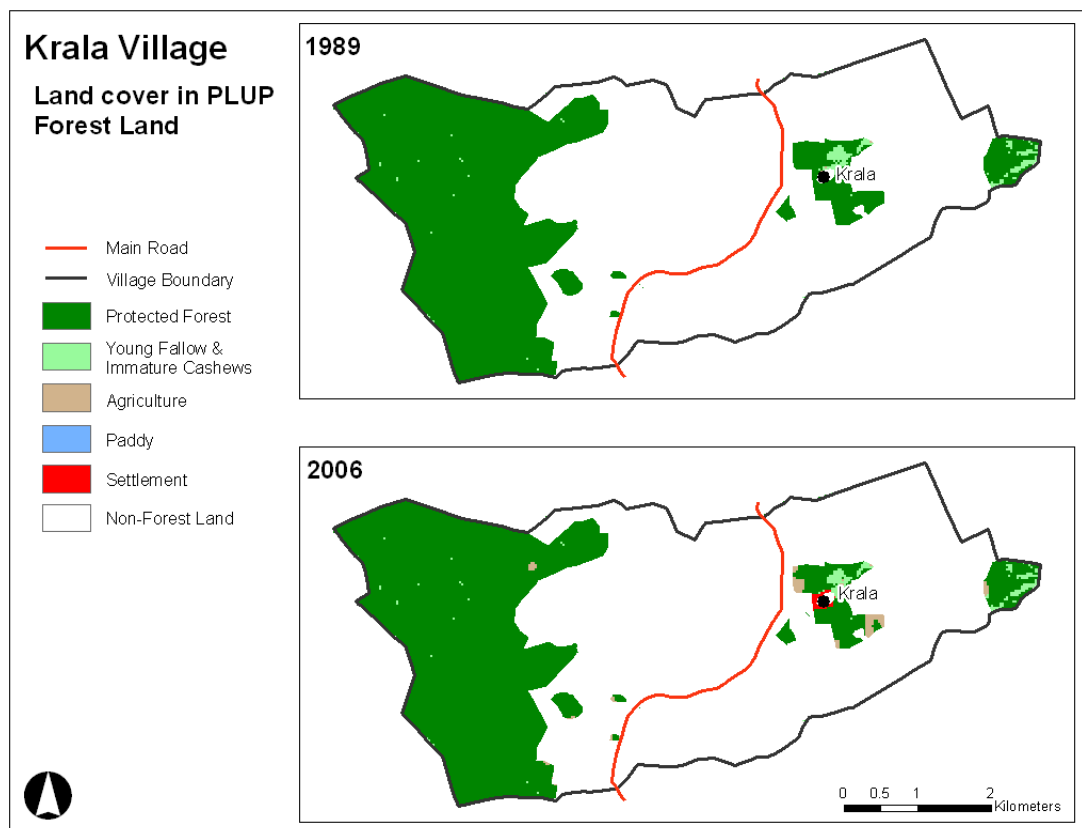


Cashew nut and fruit.

Most community members take their cashews to the Banlung market to sell because they can get a better price than if they sell to the people who come to the village. In 2006 they reported receiving 2,500R (US \$0.55) for cashews in Banlung, but only 2,300R (US \$0.52) if they sold to the buyers who come to the village.

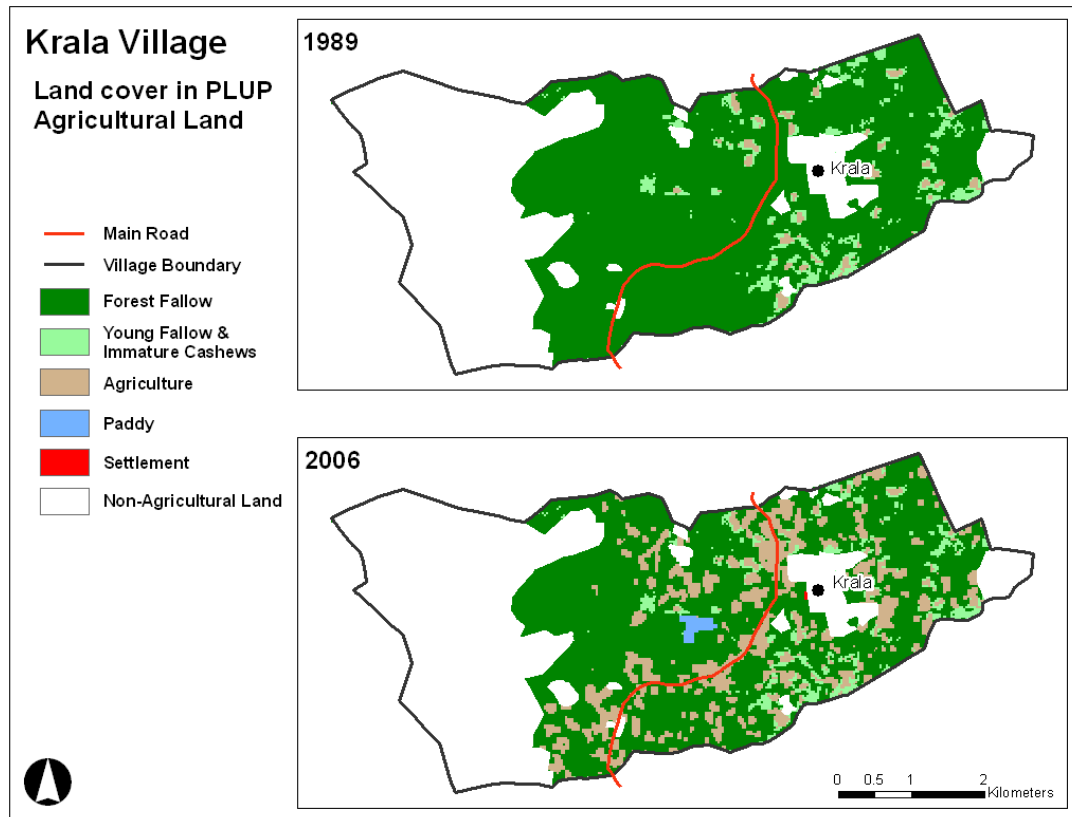
While most people prefer to travel to the market in order to yield the higher price, some community members prefer the ease of conducting the transaction in the village. Although all families are now producing cashew nuts, and most have begun to see profits, the people of Krala agree that swidden agriculture is extremely important for their food security. One community member explained that even if he could entirely purchase paddy rice with cashew money, he prefers to grow upland rice and intends to continue farming in this way into the future. Swidden farming is seen as a part of culture and a way of maintaining independence.

Map 2: Land cover (1989 and 2006) in Krala in areas zoned as protected forest in the PLUP exercise.





Map 3: Land cover (1989 and 2006) in Krala in areas zoned for swidden and permanent agriculture in the PLUP exercise.



As part of the PLUP agreement, each community member is allowed up to five ha of land for permanent cultivation, which at the moment usually means cashews. While not all families are currently using all of their allotted land for cultivation, an estimated 30-40 percent of the families are using the entire five ha for permanent cultivation. There are no limits set for how much land a family can use for swidden cultivation. In general, though, most families tend to use between one and two ha on which they grow upland rice, cassava and some short-lived fruit trees like banana and papaya.

All families in the community also plant fruit trees, such as orange, mango and jackfruit within their swidden fields. Because they are now planting fruit trees within these fields, they are less likely to use fire to clear the fields at the start of subsequent farming season. As a consequence most people feel that insect infestations that would normally be controlled by burning and clearing fields may become larger or more frequent. While recognizing the problem they are unsure of what to do about possible insect problems.

Villagers in Krala have not yet started to cultivate rubber. One community member, Mr. Hayoen Tang, indicated that he wanted to begin planting rubber during the 2007 season, and hoped to demonstrate the benefits of planting rubber to others in the community. Individuals generally recognize that rubber can be significantly more profitable than cashews and is something that they are considering for the future. Their chief concern is that it is very expensive to start and requires at least seven years before they can begin reaping any profit. At the moment, few members of the community have the financial and food security to risk the initial investment. However, other individuals indicated that they have begun to think about saving some of their profits from cashews for

developing rubber trees on their land. This offers a timely alternative to the current model of rubber production where powerful individuals purchase land from communities to develop rubber plantations.

Table 4 shows changes in land-use zoning and land cover in Leu Khun village. The land zoning data for Leu Khun village was collected as part of a "fast mapping" exercise at the commune-scale, performed by the Provincial Rural Development Committee with minimal input from members of the affected villages. The PLUP mapping exercise did not define individual village boundaries, and the boundaries reflected here represent the results of a consultation with village members conducted as part of this investigation. Of the land area which Leu Khun residents identified as their domain, the earlier PLUP map designated only 13 percent as protected forest. Within areas designation as protected forest, forest clearing persists and there remains no active efforts at protection (Map 4). The PLUP map also designates 86 percent of Leu Khun's land base for mixed trees (forest fallow) and swidden agriculture. The villagers have kept almost half of this land as forest fallow and converted the rest to cashews (Map 5).

Table 4: Land-use zoning and land cover in Leu Khun

| Land cover as mapped            |   | 1989            |          |                                     |  |                             | 2006     |                                     |  |                             |
|---------------------------------|---|-----------------|----------|-------------------------------------|--|-----------------------------|----------|-------------------------------------|--|-----------------------------|
|                                 |   | % Leu Khun PLUP | % Forest | % Young fallow and immature cashews | % Agriculture (permanent, cashews and paddy) | % Other (water, settlement) | % Forest | % Young fallow and immature cashews | % Agriculture (permanent, cashews and paddy) | % Other (water, settlement) |
| Participatory Land-Use Planning | Land use as zoned                             |                 |          |                                     |  |                             |          |                                     |  |                             |
|                                 | Protected Forest (and bamboo, spirit, others) | 13              | 10       | 9                                   | 2  | 1                           | 1        | 2                                   | 0  | <1                          |
|                                 | Mixed-use (trees and swidden)                 | 86              | 54       | 40                                  | 23   | 12                          | 9        | 33                                  | 0  | 1                           |
|                                 | Agriculture (paddy, etc.)                     | <1              | <1       | <1                                  | 0  | 0                           | <1       | <1                                  | 0  | 0                           |
|                                 | Other (settlements, wetlands)                 | <1              | <1       | <1                                  | <1   | <1                          | 0        | <1                                  | 0  | 0                           |

Table 5 shows changes in land-use zoning and land cover in Tuy village. The PLUP mapping exercise conducted there in 2002 was done with considerably more community input than the Leu Khun mapping exercise. In Tuy villagers sought to zone 27 percent of their land as protected forest. By 2006, half of this protected land was converted to agriculture (primarily rubber planted by outsiders) (Map 6). Villagers zoned about 68 percent of their land for various types of agriculture (both swidden and permanent). By

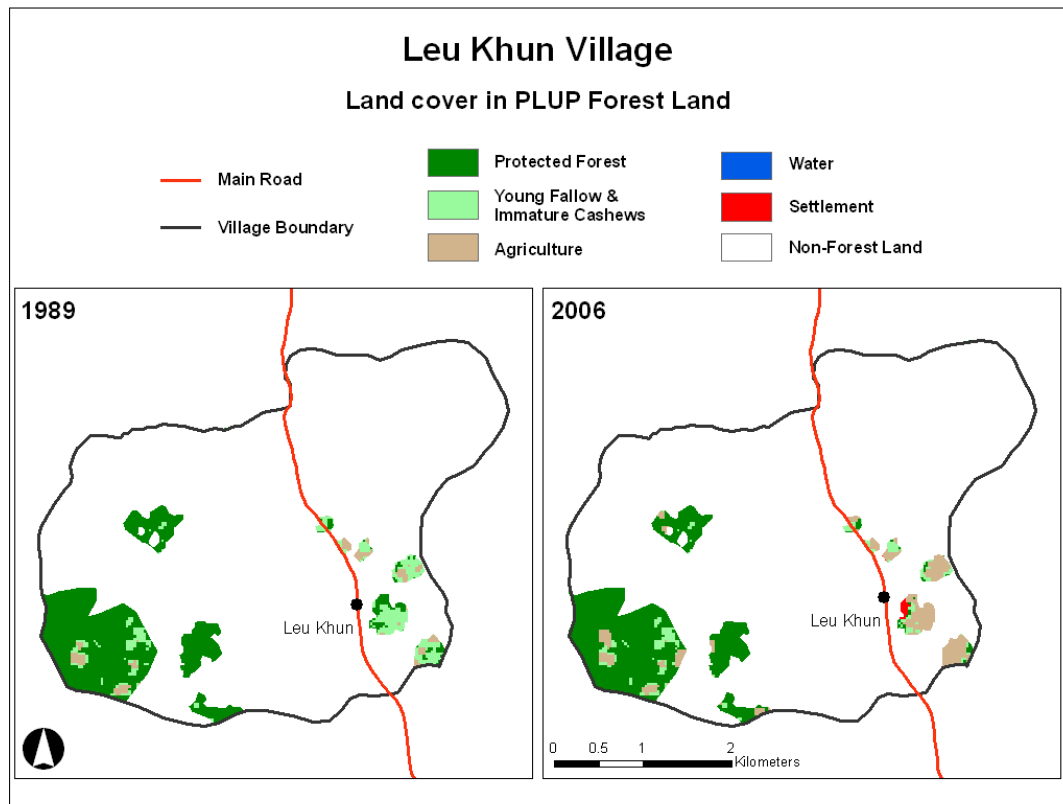


Table 5: Land-use zoning and land cover in Tuy: 1989 and 2006

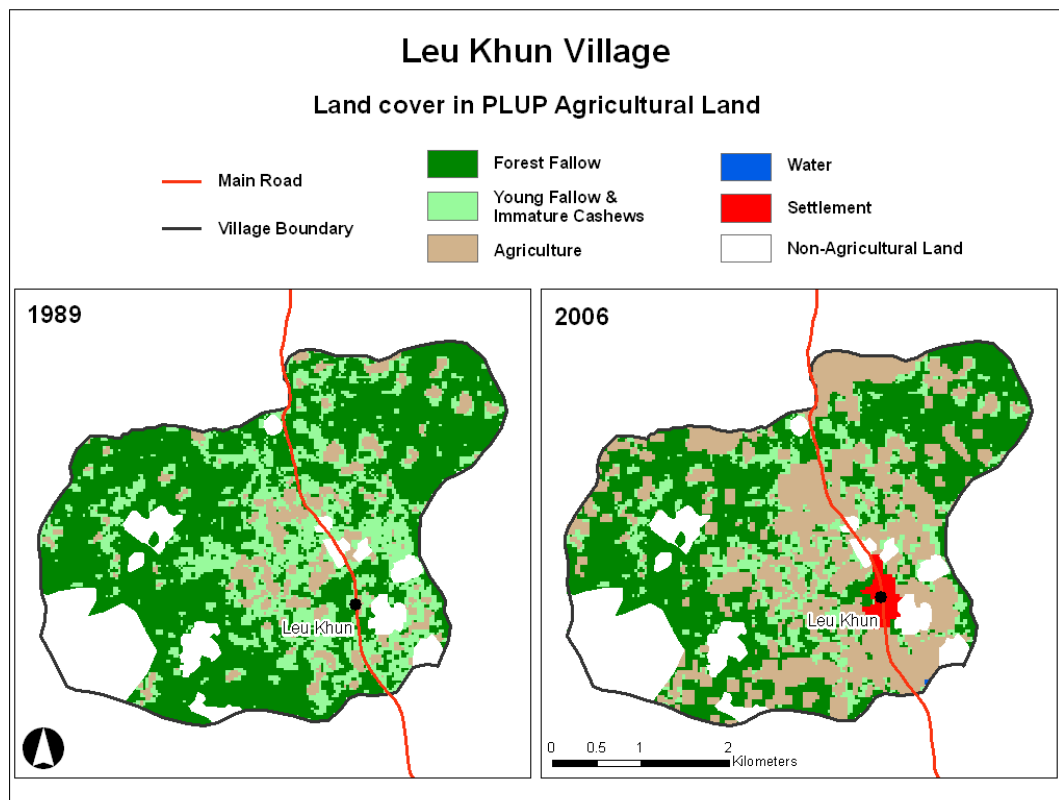
| Land cover as mapped            |  |    | 1989          |  |   |                                  | 2006          |  |   |                                  |
|---------------------------------|--|----|---------------|--|---|----------------------------------|---------------|--|---|----------------------------------|
|                                 |  |    | % Forest 1989 | % Young fallow and immature cashews 1989 | % Agriculture (permanent, cashews and paddy) 1989 | % Other (water, settlement) 1989 | % Forest 2006 | % Young fallow and immature cashews 2006 | % Agriculture (permanent, cashews and paddy) 2006 | % Other (water, settlement) 2006 |
| Land use as zoned               |  |    |               |  |   |                                  |               |  |   |                                  |
| Participatory Land-Use Planning | Protected Forest (and bamboo, spirit, others)      | 27 | 26            | 16                                       | 1   | 1                                | 0             | 10                                       | 0   | 0                                |
|                                 | Mixed-use (trees and swidden)                      | 42 | 34            | 12                                       | 7   | 1                                | 1             | 29                                       | 0   |                                  |
|                                 | Agriculture (rubber, private, barren, paddy, etc.) | 26 | 16            | 3  | 7   | 2                                | 2             | 19                                       | <1  | 1                                |
|                                 | Other (settlements, wetlands)                      | 5  | 3             | 2  | 1   | <1                               | <1            | 1  | <1  | 1                                |

2006 most of this conversion had been completed (again mainly to rubber, which was entirely planted by outsiders who purchased the land illegally) (Map 7). Villagers have only about 15 percent of their land base left for conversion to agriculture if they wish to keep anything under protected forest.

Map 4: Land cover (1989 and 2006) in Leu Khun in areas zoned as protected forest in the PLUP exercise.

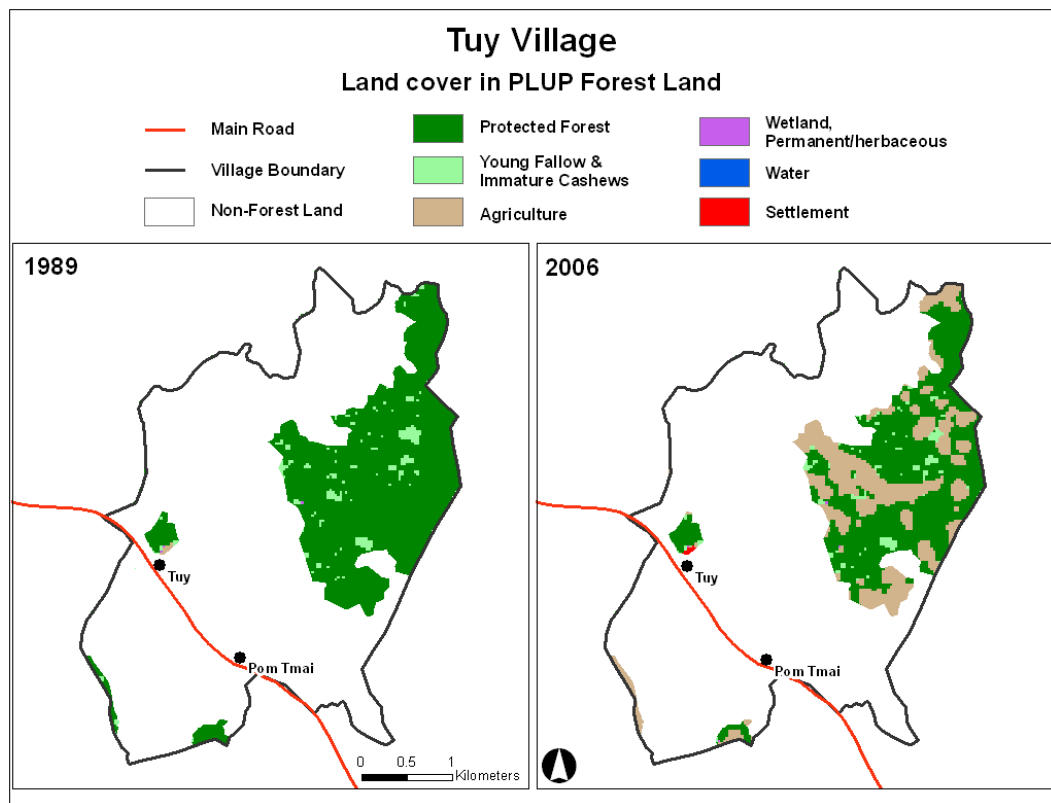


Map 5: Land cover (1989 and 2006) in Leu Khun in areas zoned as swidden and permanent agriculture in the PLUP exercise.

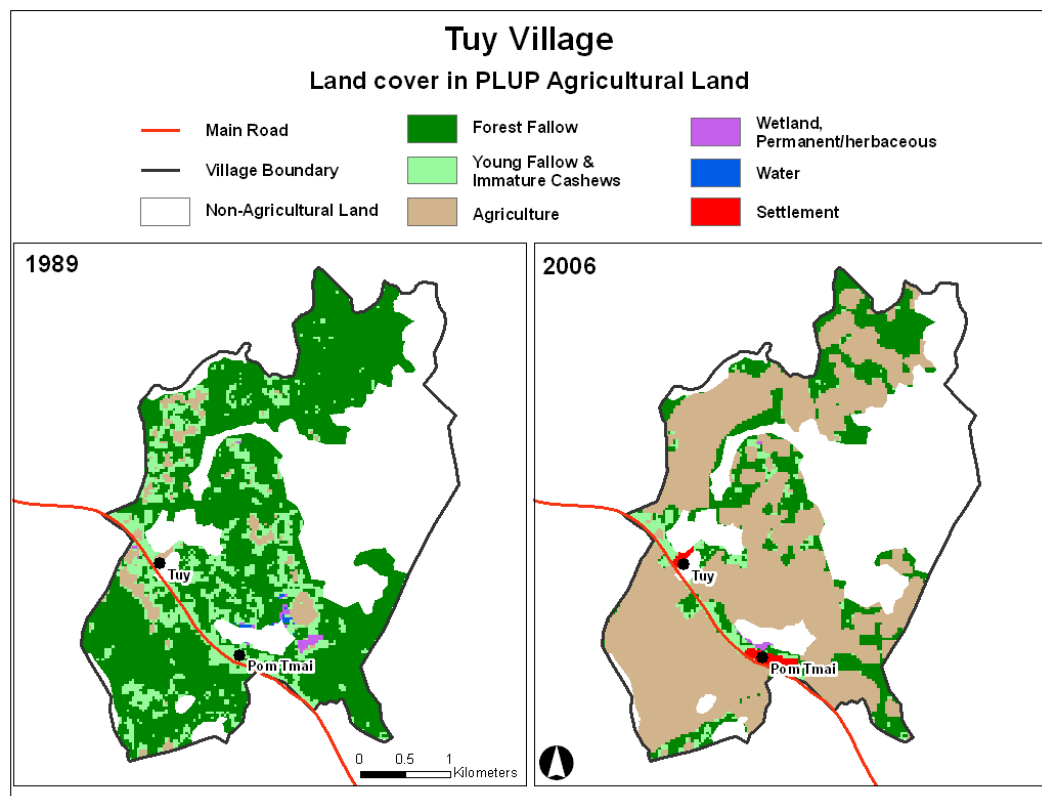




Map 6: Land cover (1989 and 2006) in Tuy in areas zoned as protected forest in the PLUP exercise.



Map 7: Land cover (1989 and 2006) in Tuy in areas zoned as swidden and permanent agriculture in the PLUP exercise.





## Forces Driving Land-Use Change

Land-use practices are changing rapidly in most indigenous communities in Ratanakiri. Part of this reflects a broader agricultural transition that has been occurring in the uplands of Southeast Asia for decades (Fox and Vogler 2005). Traditional forms of subsistence agriculture that relied on a cycle of farming followed by lengthy fallow periods are being replaced by sedentary, market oriented farming systems. While a few rubber estates were established in Ratanakiri during the colonial period (see Matras-Troubetzkoy 1983), the advent of cash crop farming by indigenous communities has largely emerged since 1993 when Cambodia opened up for international investments and new road networks began to reach further into rural Ratanakiri.

Theories of agrarian transitions have been around since Malthus (1798) first proposed that population growth drove land degradation; and Ester Boserup (1965) much later suggested that population pressure drives a change from shifting cultivation towards annual cultivation. Harold Brookfield (1972; 1984) recognized that change is not

only driven by pressure, but by new opportunities that change the productivity or quality of labor. He suggested that 'pressure of population' should be replaced by the idea that the social and cultural contexts 'within which people produce and consume must be central to any understanding of agricultural systems and agrarian change.

Jonathan Rigg (2005) argues that today, scholars of agrarian transitions struggle to keep up with the pace of change as individuals and households restructure their lives and livelihoods in response to a wide assortment of influences ranging from aspirational changes through to emerging physical resource scarcities and state interventions. Table 6 builds on Rigg's work to describe some of the forces driving changes in land-use practices in Ratanakiri.

Driving forces that affect all three villages include national policies to liberalize trade and markets, and high market prices for rubber and cashews. Annual population growth in all three villages over the last fifteen years was relatively the same ranging from 3.9% in Krala to 4.69% in Tuy (Table 1). Population density (people per square kilometer) in Leu Khun, however, was already greater in 1989 (20 people) than in Krala in 2006 (17 people) (Table 1). Dove (1982) estimated the territorial needs of swidden cultivators in West Kalimantan, Indonesia, to be approximately 16 people per square kilometer. This suggests that population pressure may have been one of the forces driving land-use intensification in Leu Khun and Tuy, and perhaps to a lesser extent in Krala. Other forces that affected the villages differently include the development of the road infrastructure that made it much easier to get to Tuy than the other villages, illegal logging which occurred primarily in Tuy and Leu Khun, and the active engagement of NTFP and other NGOs in assisting villagers in Krala to develop land-use plans, and to promote education.



Tuy villager clearing new agricultural land within the protected forest.



**Table 6: First and second level forces propelling changes in land-use practices in Ratanakiri.**

| First level propelling forces  | Second level propelling forces  | Examples   |
|--|---|--|
| Emergence of new farming opportunity   | Policies liberalizing trade and markets;<br>Ag. extension provides information on new crops<br>Introduction of land-use planning<br>High market price for new crops<br>Construction of new and improved roads | Cambodia opened up for international trade in 1993;<br>CIDSE introduces cashews in Krala;<br>NTFP and other NGOs introduce land-use planning in Krala;<br>Rubber prices continue to rise throughout the 2000s.<br>Road 78 from Ban Lung to the Vietnamese border is improved making it easier to get to Tuy village. |
| Dissolution of communal systems and ethics and growth of individualization and self benefit.   | Inadequate enforcement of land laws<br>Lack of land demarcation and titling<br>Corruption   | Farmers sell land because they fear others will illegally sell it anyway<br>Community people sell communal land because they are told by government authorities that it will be taken anyway.  |
| Environmental Degradation  | Illegal logging   | Commercial logging in Tuy (85-89) and Leu Khun (86-92) denudes the villages of large trees   |
| Increasing land shortages  | Population growth<br>Land sales<br>Effect of planting trees on a swidden landscape  | Less land available to cultivate<br>Planting cashew and other trees limit the ability of farmers to continue the burning required for swidden cultivation  |
| Social and Cultural Changes  | In-migration<br>Education<br>Social Status<br>Health Care   | School children/young adults in-migrate to Ban Lung;<br>Clinics and medicines increasingly available.<br>High social status associated with products of the cash economy—motorcycles, VCD players, etc.  |
| Human agency—practices and cumulative, unplanned processes through which global market demand is being translated into new landscapes (Li 2002). | Informal arrangements for selling land<br>Social networking among farmers teaching each other how to grow new crops   | Emergence of markets in land based on informal land tenure in Tuy village.<br>Adoption of rubber by smallholders in Tuy and Leu Khun, and cashews in Krala   |

Signs of an emerging cash economy are abundant within the three villages. Many families possess motorbikes and several have televisions and VCD players, which they power with batteries that are charged in Banlung. Villagers also collect money for sacrifices and other community needs. In Leu Khun village, one villager explained that when the water pump in the village breaks, leaders collected 10000R (US \$2.50) from each family to get the pump fixed. She said that people generally do not complain or resist making such contributions.

Additionally, villagers receive regular visits from a variety of vendors on motorbikes, selling items such as ice cream, used clothing, assorted plastic wares and even family portraits. Portrait vendors offer a variety of templates in which an individual's photo may be inserted, such as standing by a new car in front of a large house. During one visit to a village, a large group of people were seen selecting and ordering their photographs that ranged in cost from 10,000R (US \$2.50) for a single picture to as much as 30,000R if purchased with a frame.



Traveling salesmen are a sign of an emerging market economy in remote hill tribe areas.

Finally, the need for cash has grown rapidly in indigenous villages in response to new opportunities to educate children. Some parents noted that an education is necessary in order to be able to negotiate better prices for goods in the market, and to be able to talk with government officials. Yet, the level of education available within the study communities was low. Some students have left their villages to study in the district township or in Banlung. While there are no "official" fees associated with attending district schools, teachers regularly expect students to seek them out for individual tutoring sessions (which are considered vital for obtaining a passing grade), for which the students must pay. There are many stories of outright payment for passes in higher grades. Also many students do not have relatives to stay with while attending schools in towns making the cost that much higher. The NGOs working in Krala have helped the village to develop two schools that are fully functional and attended by most children. There are currently nine students from Krala who are studying at the high school level in Banlung while there are none from Leu Khun.



### **The Cashew Phenomenon**

Perhaps the most significant common denominator among the three communities from the perspective of land-use change is the nearly universal reliance on cashew nut production as the primary source of cash income. While members of all three communities continue to rely on upland rice farming as their primary means of food production, virtually every family relies heavily on profits from cashew sales to supplement their family's food needs. Overall, people from all three villages indicate that they are in a better economic position today than they were in the 1990s, and they point to cashew production as the primary factor for this relative increase in prosperity.



The common scenario within all three communities involves an integration of upland rice cultivation with the establishment of cashew plantations, whereby rice is intercropped with cashew trees for a period of three years until the trees mature and become productive.

As the trees reach maturity and preclude the continued cultivation of rice, the common practice is to then clear an additional field, or extend the current field, and begin the process again.

While this basic scenario of land-use change is equally descriptive of all three study communities, the most striking distinction among them can be seen in the level of coordination, planning and an overall awareness of the need for setting limits and maintaining portions of the land for swidden agriculture and forest conservation. Krala, having been the focus of less external pressure, stronger traditional leadership, and more intensive NGO support, has evolved a strong management structure along with a clearly defined approach to land-use planning. As such, each member of the community is highly aware of their rights to land as well as their responsibility to the community as a whole. With an eye on livelihood and environmental sustainability, they have developed set limits on the amount of land available for each family, thereby limiting the amount of overall community land that will be converted to cashew nut production.



Raw cashew nuts are a major source of cash income for indigenous villagers.


### Box 1: Growing Land Scarcity – The End of Swidden Fallows

*The experience of Mrs. Laeot Yeen of Tuy illustrates the shrinking availability of land from the community swidden fallow pool and surrounding forests and how it is forcing many households like Mrs. Yeen to supplement their livelihood through forest product collection and wage labor in order to buy food. Fallowed forest land for new swidden fields is increasingly scarce in Tuy, forcing families to continue farming while swidden lands lose fertility. Researchers have noted the shortening of the fallow cycle in Ratanakiri, and in many areas there are now no opportunities for any fallowing. Many households supplement their income through the collection of non-timber forest products, but as forests are lost this resource is also being diminished.*

Mrs. Laeot Yeen, 40, has lived in Tuy since 1999. She was born in the village but was resettled during the Khmer Rouge period along with the rest of her community. She spent about twenty



Ms. Laeot Yeen with her daughters.



six years living in a refugee camp near the Thai border. After the death of her husband in 1999 she returned to Tuy along with her four children with assistance from UNHCR which helped her to relocate and reconnect with her family. When she returned to the village, the community gave her two hectares of land which she has been farming since 2000. The land is planted in upland rice with some cassava as well as papaya and banana. She also grows some chili peppers and onions within her rice swidden. Because she lacks land she has been farming the same swidden plot for the past 6 years and recognizes that she will not be able to shift to a new field. Apart from rice, most of the food that she and her family eats is derived from either the forest or the swidden fields. She collects fish and snails in a nearby lake which she regularly cooks. She also occasionally brings snails or forest vegetables to market as a means of supplementing her income.

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## Part 3: Contested Domain: Indigenous Land Alienation

This section describes how land tenure has changed in the three study villages between 1980 and 2007. Historically, the lands of Ratanakiri have been occupied and utilized almost exclusively by seven indigenous tribal groups. These groups, for the most part, have commonly accepted territories where they practice long rotation farming, forest gathering, hunting, and maintain their settlements. Land and forests were typically held as communal property with no practice of selling or transferring land. Instead, land was viewed as a resource held in trust by the community for future generations. The limits of each village's domain was traditionally understood and accepted on the basis of the outer extent of land cultivated by each community's members, whereby it is considered inappropriate to clear and cultivate land that must be accessed by regularly crossing land under cultivation by a neighboring village. In the past, the abundance of land options precluded any major disputes between neighboring villages.

### Implementation of Land "Nationalization" Process

In recent decades, the national government has begun to exert its claims to indigenous lands as part of the state's public land domain. After independence from France in 1953 the Royal Government of Cambodia attempted to extend road infrastructure into the region, to build some educational facilities as a means to "Khmerise" the population, and to increase health services<sup>7</sup>. Aside from government efforts to integrate the province through projects and investments, spontaneous migrants from other parts of Cambodia are rapidly changing the social and ethnic composition of Ratanakiri.

In Ratanakiri the population has expanded rapidly from 94,243 people in 1998 to 124,403 in 2005, with an expected population of 181,864 by 2013, nearly doubling in 15 years. An increasing proportion of the growing population is comprised of migrants; consequently the percentage of indigenous people fell from 68 percent in 1998 to 57 percent in 2005. By 2013<sup>8</sup>, indigenous people will likely be a minority within Ratanakiri, their ancestral homeland. The combination of the growing number of migrants and outside investors is intensifying land competition in many parts of the province, while land is increasingly being viewed as a market commodity, even by local people.

While government demarcation of most land has yet to take place, technical agencies and planners have allocated economic concessions in the area for over a decade, including those for logging, mining, and other developments. Further, much of northern Ratanakiri was declared to be part of Virachey National Park, a 338,000 hectare protected area under the authority of the Ministry of Environment.



An area of disputed land in Leu Khun village where a police officer from a neighboring village has claimed 200 ha and coerced 16 families to leave their land.

<sup>7</sup>Ironside, Jeremy and Ian G. Baird. "Wilderness and Cultural Landscape: Settlement, Agriculture, and Land and Resource Tenure adjacent to Virachey national Park, Northeast Cambodia." (Biodiversity and Protected Area Management Project – BPAMP, DNCP/MOE: Cambodia) 2003, p.25.

<sup>8</sup>Provincial Department of Planning, "Ratanakiri Provincial Development Plan 2006-2010." (PDP: Ban Lung, Ratanakiri, 2005)

In Virachey National Park, the creation of the protected area has resulted in the resettlement of indigenous Brao communities to areas outside the park<sup>9</sup>. In other parts of the province there has been some displacement of local populations due to logging concession and mining activities. Nonetheless, with the exception of the Khmer Rouge Period (1970-1979), national land policies and projects have not yet been a cause of major indigenous population resettlement in Ratanakiri.

However, these policies have created a growing awareness among local people that their land rights are being contested by the government. Indigenous land alienation is likely to accelerate in the future as national development plans are implemented in the region.



### **Development of a Land Market**

In addition to land claims made by the national government, land speculators and investors have moved quickly into the province to secure land and forests. Sales of indigenous land held under communal management are “illegal land transactions” under the national Land Law which prohibits the sale of indigenous land. In relation to the land rights of indigenous communities, the Land Law states:

*Article 25: The lands of indigenous communities are those lands where the said communities have established their residences and where they carry out traditional agriculture. The lands of indigenous communities include not only lands actually cultivated but also includes reserves necessary for the shifting of cultivation which is required by the agricultural methods they currently practice and which are recognized by the administrative authorities.*

As discussed in sections below, some areas of mature forest may be included in the communal land title of indigenous communities. The possibilities for indigenous communities include communal ownership as described in Article 26 of the Land Law:

*Ownership of the immovable properties... is granted by the State to the indigenous communities as collective ownership. This collective ownership includes all of the rights and protections of ownership as are enjoyed by private owners. But the community does not have the right to dispose of any collective ownership that is State public property to any person or group.*

Even in the interim period before communities are recognized as legal entities they have land rights:

*Article 23: Prior to their legal status being determined under a law on communities, the groups actually existing at present shall continue to manage their community and immovable property according to their traditional customs.*

As previously mentioned, “traditional customs” do not include land sale.

While community lands can not be legally sold, corruption, the lack of surveys, registration and documentation makes indigenous lands vulnerable to speculators who frequently enlist local officials to facilitate illegal sales. This is creating a rapidly expanding illegal land market, with indigenous communities increasingly aware that their communal resources have become a market commodity and a source of cash. The need for cash to meet education and health costs, improve housing conditions, buy consumer durables, and meet rising community and family expectations is common throughout

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<sup>9</sup>Ibid



virtually all indigenous communities in Northeast Cambodia, so the motivation to raise cash through land sales is clearly present. This is clearly abetted by an atmosphere of self-interest that culminates in minimal adherence to laws.

In most cases, community members are uncertain as to who owns title to the individual parcels that have been sold, as many of the initial transactions are made with a broker or land speculator who, in turn, sells it to other Khmers. Once the initial transaction is made, community members are no longer included in the process and may only learn about the final owner when development begins on the purchased land. The lack of transparency and clear communication in this process of multiple land transfers is creating tensions within villages. However, these offenses usually go uncontested, owing largely to the lack of process, documentation and viable enforcement. As a result, feelings of discontent and animosity linger on, and some community members have suggested that there could be violence in the future.

When asked about how land sales are recorded and parcels delineated, villagers are unable to define the process or any clear distinction on the limits of the land sold. In many cases, a commune official stamps a document noting the sale. Money is exchanged with a general understanding of transfer of ownership, without any surveying, or physical demarcation of the limits. The villager may use his thumb print to notify approval of the sale, but rarely if ever receives a receipt or copy of the sales document. Moreover, because there is some shame associated with the practice of selling land, these transactions generally do not involve witnesses. A devastating result of this lack of transparency and documentation is the common scenario where the new owners of the land will clear and use significantly more land than was originally agreed upon. When villagers protest or confront the new landowner about their breach of agreement, the landowner will frequently ask "Where is your documentation to prove how much I purchased? Where is your stamp?" In the face of these responses, community members express a sense of confusion and powerlessness, feeling they have no recourse for contesting their claim. Once the land has been cleared and planted by new owners, community members do not feel that they have the power or support to reclaim that land. This section will examine how land tenure rights are changing in the three study communities.




### **Tuy Village – A Case of Rapidly Privatizing Tenure**

Tuy was selected as an example of an indigenous community that is rapidly losing its communal land and forests to outside buyers. While there is no official record of any land sales within the village, discussions with members of the community's Natural Resources Management (NRM) committee suggested that more than 100 ha of land north of the village proper were sold between 2003 and 2007. Respondents estimated that approximately 50 percent of the community's lands had been sold to outsiders over the past decades, illustrating the land sale processes that are operating in many communities across the province.

Community members reported that individual land sales grew rapidly after the commune chief



First parcel of land to be sold in Tuy village by the commune chief. It is now a rubber plantation.



sold the first piece of land in 1998. The commune chief convinced community members to allow a piece of land larger than 200 ha to be used for "development" with assurances that the community would benefit from associated economic opportunities. Once the agreement was made, the land was transferred to a series of owners and ultimately cleared for a private rubber plantation. One community member reported that as people observed the commune chief becoming wealthy from selling this land, many decided that they wanted to gain money from their lands too; particularly before the commune chief sold them for his own enrichment. Adding to this has been the complete absence of any disciplinary measures against officials for selling land, despite land-use plans to the contrary and community complaints.

The Tuy village chief revealed that at least 80 of the 103 families currently in the village have already sold land, mostly to Khmers. Few of these Khmer families actually live within the village; most of them reside in Banlung and rely on other people to manage their fields. They also engage local community members for day labor jobs on an as-needed basis. Land transactions are typically conducted secretly between a single community member and a buyer, with the transaction often brokered or promoted by a local government official. According to several accounts, these transactions are most commonly brokered by the commune council chief himself. Indeed there were many reports of commune councilors telling people they had a legal right, almost a moral obligation to sell land and that the government will take the land anyway if it is not sold (to which there has been no rebuttal).

The commune chief indicated that when land sales occur village elders and the NRM committee are not consulted. Rather these sales are supported by the commune council office where they have an official stamp with which to validate the transactions. Most land sales that have been reported emerged from conditions of poverty and desperation and are frequently precipitated by a sickness in a family or an insufficient harvest and a need for immediate cash. In the past, when someone became ill, they would rely entirely on traditional medicine; with the advent of Western medicine and access to clinics and hospitals, community members are more likely to seek out these facilities in times of illness. But if they lack savings or the ability to borrow money, people turn to their only source of immediate cash—their land. Community members reported that buyers are always on hand waiting for the opportunity to make a purchase. Many people also report that they were given inflated medical bills which prompted them to sell their land.

Whereas most of the land sales have been secretly conducted by individual community members, one land transaction that was conducted by the community as a whole involved the trade of ten ha of land to a Khmer family in exchange for the lumber and other materials desired for construction of the large community meeting hall in the center of the village.

Although the existence of land sales is common knowledge within the village, most members are resistant to admitting their own involvement or to talk about their experiences. The village chief indicated that he has not been involved in any land sales. However, community members report that the previous chief who retired in 2005 was among the first members of the village to have sold land. When asked if land sales were still occurring, the new chief indicated that there would be no more land sales because there is not enough land remaining, and that people now recognize how important the land is to their livelihood.

Individual community members who were willing to talk about their experiences selling land admitted to selling relatively small parcels of one to two ha; yet it is clear that much larger transactions have taken place within the village. While many people expressed a sense of shame regarding decisions to sell land, they also revealed that



there is no reprimand or punishment directed at those who choose to do so in spite of the fact that these decisions have a strong impact on the entire community. Members of the community still consider each transaction to be a personal affair. Moreover, there remains no set limits on how much land one person may acquire or sell, as the only criteria for determining claim to land is that of current or recent use.

Now, however, the village appears to have reached an actual finite limit on the amount of land available for cultivation, and there appears to be a real sense of urgency for establishing clear ownership of land and maintaining it. For many people, this means planting cashew and fruit trees, both as a means of generating income and establishing ownership. This sense of urgency has also giving rise to growing tensions between community members, where heated disputes over property boundaries and rights of use are becoming more common.



### **Leu Khun – A Case of Eroding Communal Tenure**

In the case of Leu Khun Village, there is some degree of community solidarity, and a prevailing, although not unanimous, resolve for maintaining their lands under communal stewardship. While the previous village chief was considered to be a strong leader, there are many in the community who question the ability of the new chief, appointed in 2005, to help the community maintain control of their land. Moreover, there is an overall lack of strong NGO support and guidance on issues of land management and protection. As a result, people in Leu Khun have begun to succumb to pressures to sell their land, and while there is strong opposition to this practice among many community members, they are generally ill-equipped to block the sales, to address issues of land grabbing by Khmers, or to fight claims on their land from neighboring villages. These ever present and increasing pressures have created an air of tension and fear within the village, and an overall uncertainty about the future of the community.

We visited Leu Khun in January and April, 2007. Between these two visits, a number of small shops were established along the main road selling a large variety of commercial items including soaps, cooking supplies, snacks and motorcycle parts. This commercial activity may be partly the result of income generated by the recent cashew harvest, but it may also be the result of short-term gains from recent land sales. Leu Khun village appears to be faced with two potential paths to follow in the coming years—the paths of Krala and Tuy. While many villagers are familiar with the example of Krala, there are initial indications that people are beginning to follow the model of Tuy. People are confused about why they have not received the same amount of NGO support that other villages have received. Several community members interviewed expressed an eagerness to develop and wanted to learn how they can protect their land, but in the absence of NGO support, they are uncertain how to stop the sale of communal forest and swidden lands.



Leu Khun Commune Chief (right) reputed as an active broker in local land sales.



### Krala – A Case of Continuing Communal Tenure

As with other communities in the area, villagers in Krala have received numerous offers to buy their land. People recount with an air of experienced bemusement how companies and individuals have come to them saying that they want to help the community, and that by allowing the company to grow rubber on their land they will create jobs and security for the community. They have heard the stories of what has happened in other communities and do not take these offers seriously. They remark that often when these offers are refused, the businessman and or government officials return and pressure them, reminding them that this land is really not theirs, that it is state property. They say that these threats were frightening to them in the past, but now they feel strong and secure in their rights to their land, and that they are not intimidated by such claims.

They also remarked that one of the reasons they were able to remain strong and unified in their resolve not to sell lands is the fact that they have income from their cashews and do not need the money that is offered. The village was approached by potential buyers as recently as 2006, and they had reasons to believe that the Poey commune chief was helping to facilitate the effort. They responded with a very assertive warning to the chief, "If you sell our land, we will kill you."

"What we need is our land. We have respect for the forest and the land and rely on it for our survival," said Yuen Tan, a village member. "We are not like the people in Phnom Penh who only need a little piece of land to put a shop on and sell things. We need our land to grow food, and because of this we will not sell our land." He went on to explain that, "This is what we tell people when they come here trying to buy our land."

The people of Krala have established strong community policies and regulations to retain communal control of their village land and it is apparent they are effective in deterring illegal land purchases by outside investors. Still, Krala's communal lands may remain vulnerable to Economic Land Concessions (ELCs) issued by the central government. Without a reduction in corruption and any formal agreements from the central government providing recognition of their communal tenure rights under Articles 25 and 26 of the Land Law, the forest and land resources of Krala remain vulnerable.



The changing landscape of Ratanakiri.



### Forces Driving Land Tenure Change

Poverty appears to be the most common force driving indigenous communities to sell their land. Villagers frequently reported that falling into debt due to costs incurred by illness or food shortages was the main reason that they sold their land. The cost of medicine and the services of doctors frequently could not be covered through cash on hand and consequently family heads would reluctantly agree to land sales, often their young cashew plantations (see Box 3). With over-charging and without opportunities to borrow money at reasonable interest rates, many indigenous families have no recourse but to sell their farm land, exacerbating problems of food insecurity and cash income. It



has been reported that there are brokers hovering at local medical facilities prepared to "assist" people in selling their land to cover medical expenses.

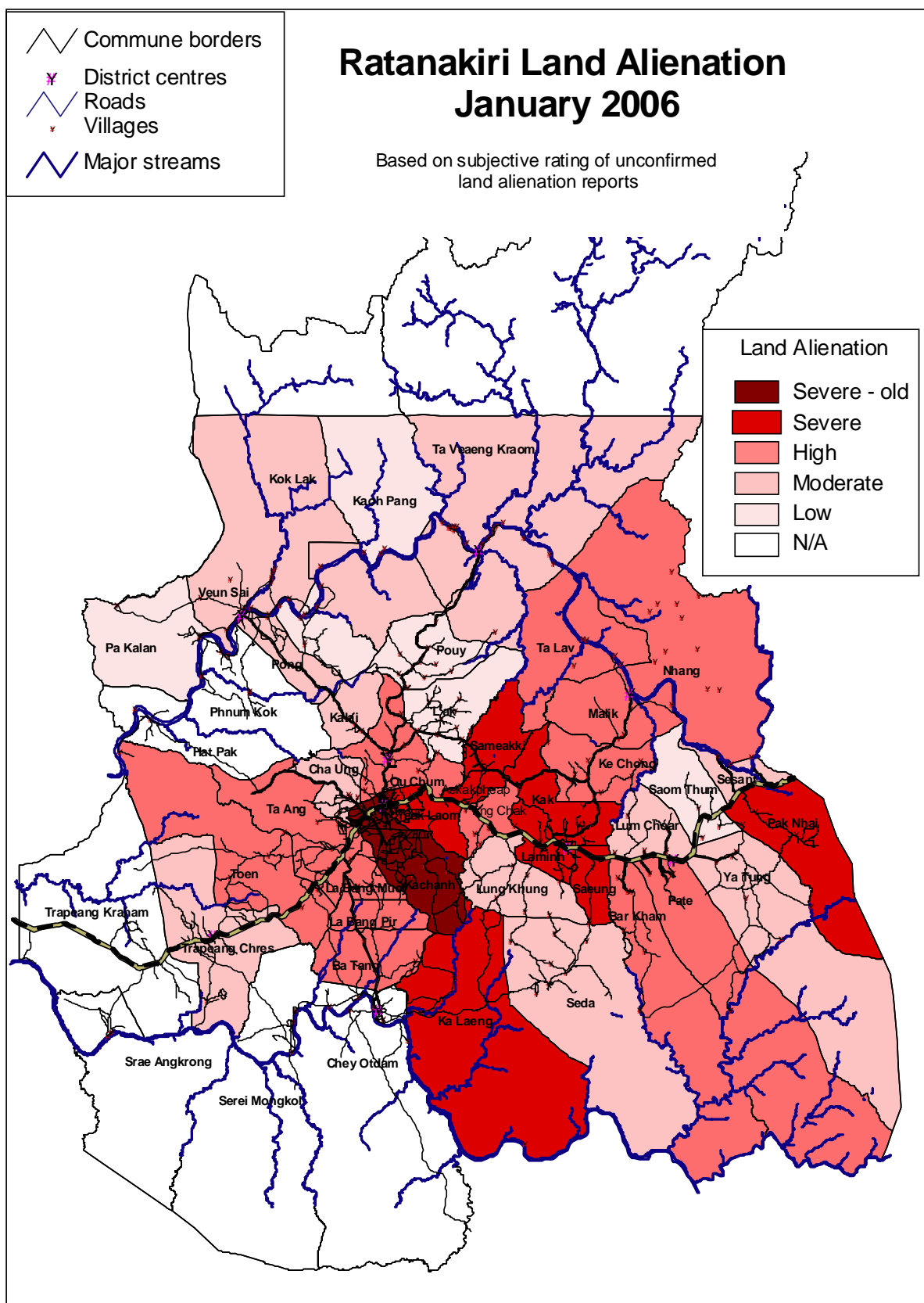
Villagers are also responding to new opportunities to educate their children creating another need for cash. While there are no "official" fees associated with attending the district schools, teachers regularly expect students to seek them out for individual tutoring sessions, for which the students must pay. Students accept that these tutoring sessions are a necessary prerequisite for passing exams and advancing to higher grades. In Tuy and Leu Khun educations opportunities are limited and relatively costly for poor rural families. In contrast, with support from NGOs, Krala has been more successful at creating better educational opportunities for its children.



A young man from Leu Khun village was forced to stop his education in the district capital at grade 7 because of the high cost of fees.

The opening of access to Ratanakiri, a once remote corner of mainland Southeast Asia, to the outside world and its markets is changing land use and tenure patterns. A major factor in the creation of new market linkages has been the development of road networks, and the growth of district and provincial towns. As Map 8 indicates, it appears that the most rapid rate of indigenous land alienation is occurring around Ban Lung and along Highway 78 that links northeast Cambodia to the central highlands of Vietnam. In summary, corruption, lack of transparency, mis-information, poverty and a growing need for cash makes indigenous people highly vulnerable to land alienation in Ratanakiri, especially where community leadership is weak and land market penetration high. It seems likely that a significant proportion of indigenous lands will be sold to outsiders over the next decade unless actions are taken to slow this process. Joint action is needed that links indigenous communities, NGOs, and local government in efforts to increase transparency and to establish the rule of law. If this can be done, the work to map and support communal land titling efforts, endorsed by the relevant central government agencies can proceed. Additionally, support is needed to assist indigenous communities in developing sustainable income generation practices.

Map 8: Estimated Rates of Land Alienation in Ratanakiri<sup>10</sup>



<sup>10</sup>Brown, Graeme. "End of Contract Report to CFI" (Phnom Penh, Cambodia 2008).



## Box 2: Land Sales and Illness

*Mr. Phong's experience illustrates how families are forced to sell their land in times of illness. Medicines and doctor visits are costly and most households have few resources to pay for these important services in times of crisis.*

Up until 2006, Mr. Phong maintained 3 ha of mature cashew trees but found it necessary to sell half of that land in order to help pay medical bills due to an illness. This illness prevented him from cultivating rice during the last season making it difficult for him to feed his family. The cost of purchasing rice along with medical expenses created an urgent need for cash and his land was the only option available for meeting that need. At the time that he decided to sell the land, he told his brother-in-law, who in turn helped him to contact the Khmer buyers. "I sold my land because I was poor," he said. "Now I am still poor, and I don't have my land. This was not a wise thing for me to do."



Mr. Phong and his family, Tuy Village.

He explained that the people in Tuy village want to develop and to learn how to buy and sell things like the Khmers. He went on to explain that the people in the community need someone to teach them what to do. "The Khmers know how to do business, and so they develop and get rich," Mr. Phong said. "But we are uneducated and do not know how to make money. So we stay poor."

Illness also resulted in the loss of Mrs. Chanthon's land in Tuy Village. She is a 36 year old Tampouen woman living in Tuy Village and is married to a Lao man. She became ill in 2003 and did not have money to pay for the medical care that she needed. In order to cover those expenses, she and her husband sold their land, their cow and their pigs. They also no longer had enough money to support her son in school, and he was forced to leave the school and return to the village.



Ms. Chanthorn (left) in Tuy Village.



## Part 4 Impact of Participatory Land-Use Planning (PLUP)

This section examines experiences with a variety of participatory land-use planning (PLUP) activities in the study communities, assessing their effectiveness in guiding land-use change and stabilizing land tenure. The analysis reviews the land-use plans that emerged from PLUP activities in each village and compares them with actual land use as reflected in remote sensing images from December 2006. Natural resource planning processes involve a multi-stakeholder dialogue and produce maps and planning documents that are recognized by government. These documents should help to regulate land use and stabilize tenure change in accordance with national law and policy.

Small scale land-use mapping began in Ratanakiri Province in 1996-97 as part of the CARERE project started by International Development Research Center (IDRC-Canada) and NTFP. In 1998, the Cambodian Government launched the SEILA Project that included a community-based natural resource management planning subproject within the Provincial Department of Environment. By 1999, donors and government officials, observing the growing incidence of illegal land grabbing, decided that mapping needed to be accelerated to contain the loss of indigenous community forest and land rights. A GIS Unit designed to support community land mapping was established in 2000 in Ban Lung. The GIS Unit worked with a field team to assist villagers to draw sketch maps of their current land. The villagers formed NRM committees consisting of men and women elected by the village to oversee the mapping process. Sketch maps were then converted into digitized topographic maps to make a "Scale sketch map." The villagers were then supposed to approve the map, along with rules and regulations for land use in the village area. This document was then approved by provincial authorities and recognized as proof of community use and management of the area<sup>11</sup>. Mapping activities targeted land along Highway 78 that links Ban Lung to the Vietnamese border and where land speculation and deforestation has been most rapid. The GIS Unit had completed twenty-three out of forty-nine communes in the province by 2004.



Tuy villagers point to the site of recently cleared land in an area designated as protected forest on the PLUP map.



### Experiences of Three Communities with PLUP Processes

#### *Krala Village—An example of successful planning*

The most successful participatory NRM planning activities occurred in Krala Village where villagers began land-use planning activities in 1998 with support from a German Technical Assistance (GTZ) technician. Initially this process relied on "sketch" mapping

<sup>11</sup>Sarem, Lot, Jeremy Ironside, and Georgia Van Rooijen. Understanding and Using Community Maps among Indigenous Communities in Ratanakiri Province, Cambodia. In Fox, Jefferson, Krisnawati Suryata, and Peter Herschok (2005) **Mapping Communities: Ethnics, values, Practice**. (East West Center: Honolulu, Hawaii) p.44.



that was used to develop a land-use strategy and as an advocacy tool when dealing with the provincial and national government<sup>12</sup>. A GIS map of Krala was completed in 2003 with support from the NTFP a local NGO. NTFP helped communities to produce GIS maps that demarcated areas villagers have allocated for forestry and agricultural use, as well as protection<sup>13</sup>. The NTFP went further to assist the community to develop land-use regulations and by-laws to manage their forest and land.

Villagers concerned about land alienation occurring in neighboring communities were quick to see the usefulness of mapping. As one villager noted: "If we have no map, land disputes will increase<sup>14</sup>." According to one study, 80 percent of the villagers interviewed said they wanted maps to display them in their village.

*People feel that maps help them to stop illegal logging and other activities. They use maps as documents that establish their territorial claims with outsiders such as government authorities and company representatives. Previously villagers did not have clearly demarcated boundaries, and villagers would frequently cross each other's territories to make new swidden fields and to gather non-timber forest products. During that time they also had disputes over benefits, but these were solved following accepted traditional procedures<sup>15</sup>.*

In Krala, both sketch maps and GIS maps were created by villagers with help from NTFP. Sketch maps helped the community to understand their boundaries and discuss land-use zoning. GIS maps were created to provide local and national government with precise coordinates regarding boundaries. The tribal chief noted:

*Both maps are very good, and I need to display both of them in my village. I can remember the sketch map in my brain and the GIS map has many signs, colors, and marks on it and no one can understand it completely except clever people<sup>16</sup>.*

While NTFP held several mapping training sessions, these largely involved members of the NRM committee. The eleven members of the NRM committee in Krala village met weekly to develop their plans and mapping activities. While the planning and preparations were all performed by committee members, the final decisions on all matters that impacted the village were made at village-wide meetings, at which at least ninety percent of community members were usually present.

According to one NTFP staff person, the people in Krala village have worked hard on developing their land-use plan as well as their rules and regulations that have been recently revised and are currently waiting approval at the commune council level. Many people have dedicated a significant amount of time to attending meetings and collecting GPS data in the field. Informants shared that they are tired, and some members would like to take a break, but they all expressed enthusiasm for the work they are doing and pride in their accomplishments.

The community's rules and regulations set penalties and fines for offenses such as causing a fire in the spirit forest or burial forest or for burning another person's field. However no limits were set on the collection of non-timber forest products for subsistence use.

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<sup>12</sup>Prom Meta and Jeremy Ironside. *Effective Maps for Planning Sustainable Land Use and Livelihood*. In Fox, Jefferson, Krisnawati Suryata, and Peter Herschok (2005) **Mapping Communities: Ethnics, values, Practice..** (East West Center: Honolulu, Hawaii) p. 29-40.

<sup>13</sup>Ibid p.30.

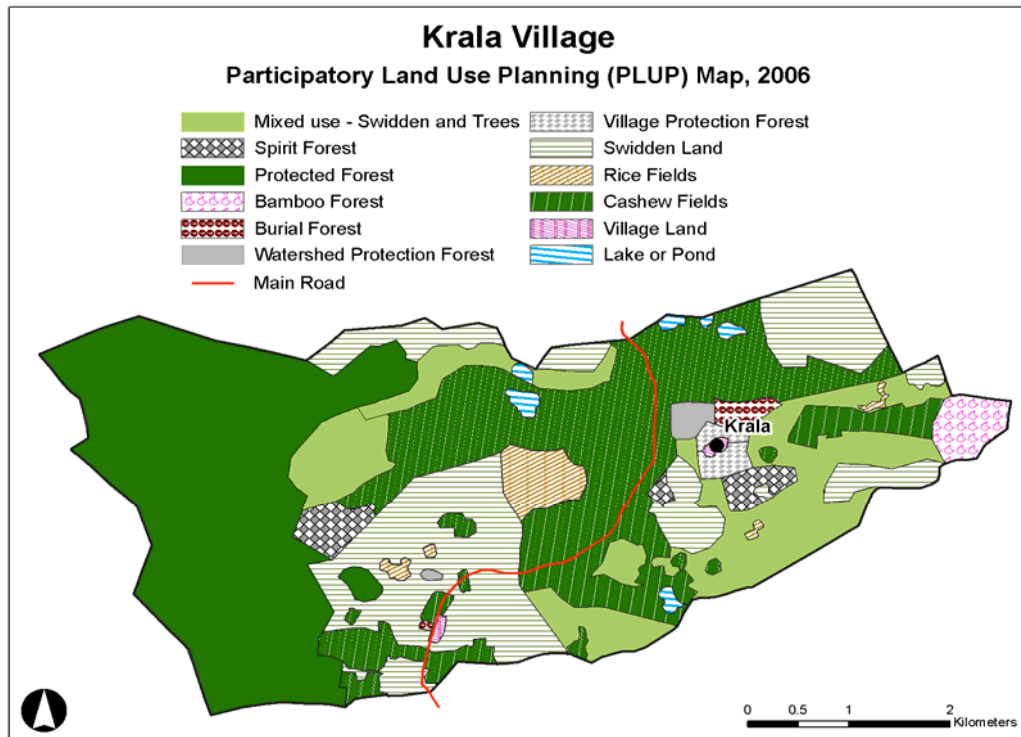
<sup>14</sup>Ibid, p. 36

<sup>15</sup>Ibid. p. 34

<sup>16</sup>Ibid, p. 36.

If someone wanted to create a business that relied on the collection and sale of non-timber forest products they would be required to obtain permission from the community and possibly pay a fee to the community. The village's rules and regulations allow land sales, however, members are only allowed to sell land to other members of the community. Selling land to outsiders is strictly forbidden, and would result in expulsion from the community. Krala, with the support of NTFP, has also submitted an application for a communal land title to the provincial authorities. Their application has the support of the Ministry of Interior, but has not been approved by the Ministry of Land.

**Map 9: Krala Village Participatory Land-Use Planning Map (2006)**



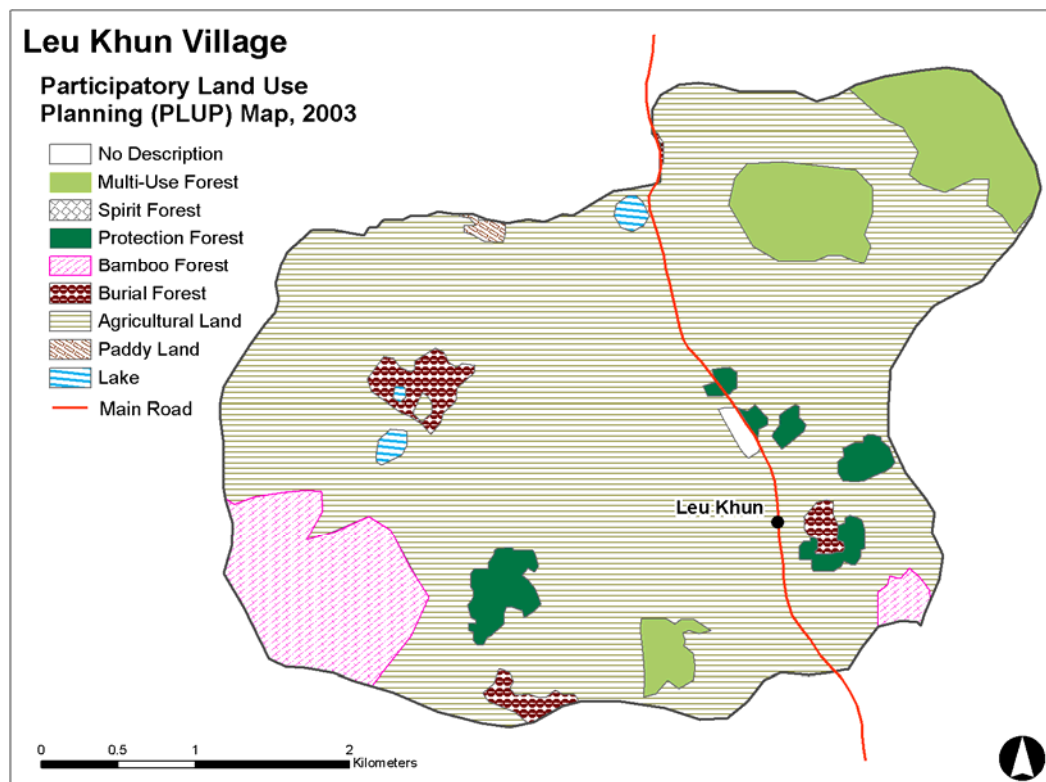
The land-use planning and dialogue process in Krala was successful in guiding land-cover change. For example, virtually all of the protected forest, bamboo forests, burial forest, and watershed and village protection forest remained under forest cover between 1989 and 2006. Forest lands that have been cleared and converted for cashew cultivation were all drawn from the mixed use and swidden agricultural land pool designated in the plan. This is apparent by comparing Map 2 with Map 9.

***Le Khun Village—An example of “Fast Mapping:” A Rapid PLUP Process***

In Leu Khun Village a PLUP map was prepared in 2003 by members of the Provincial Rural Development Committee with the guidance and support of the SEILA program. The PLUP process that generated the map neglected to establish a consensus among key local leaders regarding village and commune boundaries. No community members participated in the drawing of this map, except for the former village chief. The former chief, who is now deceased, acted as the primary informant from the village. Villagers we interviewed expressed a desire to have a map of the community which shows the village's boundary, but they are not certain about how to do this. They would also like to have ownership of their land, and have not heard anything about the communities who have requested communal land title.



**Map 10: Leu Khun Village Participatory Land-Use Planning Map (2003)**



In Leu Khun, SEILA, under pressure to cover a large portion of the province, adopted a rapid PLUP process of “fast mapping” that took less than two weeks to complete. Inter-village boundary demarcation was not attempted during the PLUP process, which focused only at the commune level. Because the PLUP map failed to achieve consensus on village boundaries, it created conflict among villages over boundaries. Today, these problems are multiplying as land speculation and sales increase. Further, the PLUP mapping did not occur until 2003 by which time land sales were already underway. The PLUP process did not address this problem.

The PLUP process did not resolve inter-village land conflicts and the PLUP maps are not being used to guide land-use decisions. The Highlanders Association and the Ratanakiri Natural Resources Management Network, however, are creating a community dialogue to halt any further land sales to outsiders. Some families are promising to conform to new community resolutions (see Box 4).

***Tuy Village—An example of “Too Little Planning Too Late.”***

In 2000 Tuy Village became one of the first communities to start land-use mapping with training exercises involving several communes and villages. The CBNRM project used a “slow approach” to the land-use planning and mapping process in the village that extended over three years. By the time the mapping began, however, significant amounts of land sales had already taken place. As mentioned earlier, over 80 percent of all households have sold land to outsiders. The most recent PLUP map produced by the SEILA program in 2002 (see Map 11) recognizes extensive private land holdings in Tuy. According to this map, all of the land south of the road, and nearly all of the land along the north side of the road and along the western margin of the village are private land, and are being converted to rubber plantation or commercial development by Khmer migrants.

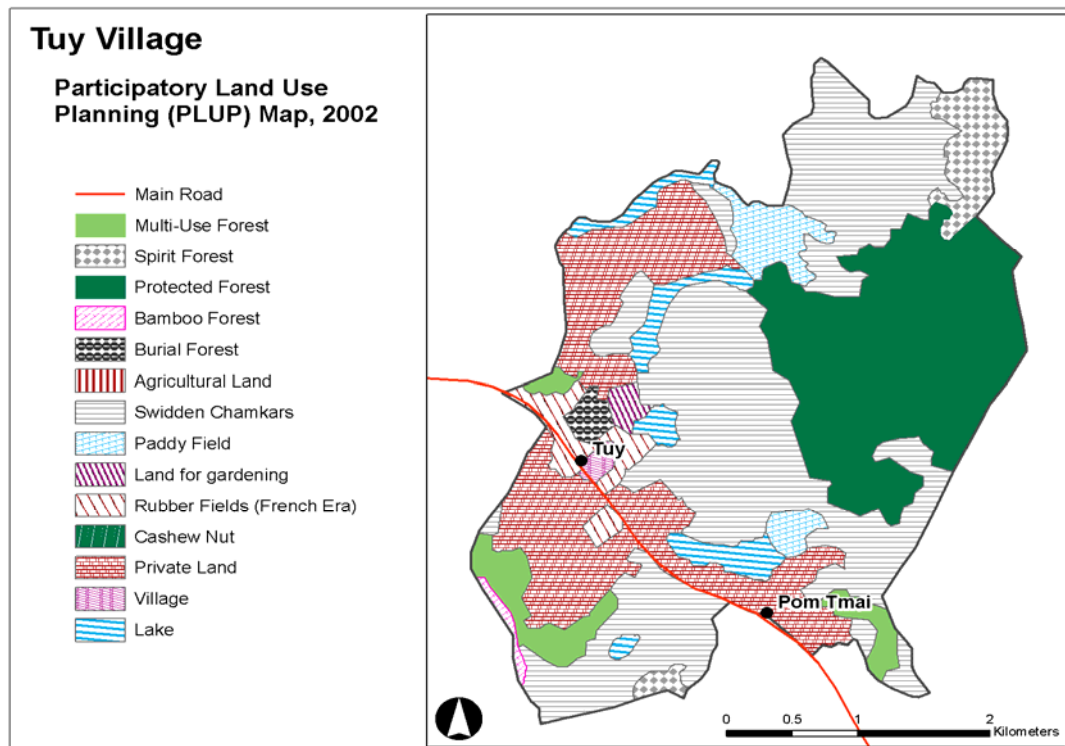
The area along the north side of the road to the east of the village proper is occupied by a rapidly growing Khmer village known as Tmay (New in Khmer). The SEILA-PLUP map represents this land as being under private ownership, however accounts indicate that this represents only a small portion of the total land area that has been sold to or taken by outsiders.

While Tuy relied on a “slow process” of planning, the actual mapping process was done in 15 days of actual work (see Map 11). There was little time for broad-based participation of community members and representatives of neighboring communities. The process was completed in 2002 after a number of land sales had already taken place. While an attempt was made to negotiate formal boundaries between the villages in the commune, the maps were not widely distributed and there was no follow-up by SEILA. As a consequence, the inter-village boundaries are now disputed and a source of conflict. Further, the land-use zoning has not been followed in terms of management. As indicated in Map 6 and Map 7, forests have been extensively cleared not only on the land zoned for agriculture (Map 7), but in the areas zoned for forest protection as well (Map 6).



Cleared land in the protected forest in Tuy village.

#### Map 11: Tuy Village Participatory Land-Use Planning Map (2002)







### Summary of PLUP activities

Ratanakiri Province has had mixed results with participatory land-use planning over the past decade, in part due to limitations of the human and financial resources needed to implement effective and participatory planning and to facilitate implementation. Actors responsible for implementing PLUP activities in the province decided to speed up the process by focusing on commune boundary demarcation with reduced time for community meetings and dialogue due to a number of factors including donor pressure, the absence of sufficient trained staff, mounting pressures on land, and illegal land sales. The consequences of accelerated planning was first to leave village boundaries undemarcated and open for conflict,

and second to limit community involvement which resulted in a general lack of understanding of the management plan among stakeholders. In the case of Tuy and Leu Khun villages, most villagers had not seen the land-use map, let alone had it explained to them.

PLUP activities also suffered from the lack of effective mechanisms for implementing the plans. While all study communities attempted to form NRM committees to monitor land and forest use and planning, only the committee in Krala appears to be functioning at the present time. The success of the Krala committee is due, in part, to the continuous presence of NTFP staff who visit the village each week for discussions.

A recent assessment of land-use planning in four villages in Ratanakiri where the provincial government GIS and CBNRM projects were working made the following observations:

*Maps and regulations can be used to control the activities of outsiders, but the project documented several cases where maps were not enough to control land alienation<sup>17</sup>.*

*Some villagers said that maps can be used to communicate where illegal activities are taking place. One villager said that without a map, not much can be done about people coming and cutting trees or cutting an area for a swidden field in their village. They felt that using a map adds authority: as a participant said, "If there is no map people don't believe."<sup>18</sup>*

In comparing the experiences with PLUP it is apparent that there were a number of important differences in terms of methods and processes (see Table 7). The most successful experiences were from Krala, because of the long term commitment of NTFP to not only facilitate the PLUP, but to build the capacity and the commitment of the community to implement the plan. In Krala, initial mapping activities took place in 1998, before any land transfers had taken place. NTFP focused on engaging and empowering community members to document their communal land resources, with a strong message that these should continue to be held under the stewardship of the community. The process of mapping and land management planning was completed in 2006, after nine years of discussions with NTFP facilitating these discussions. This allowed for an ongoing updating of the plans to address needs for cashew land and other considerations.

In summary, these case studies indicate that the success of participatory land-use planning and mapping depends on the quality of the process in terms of engaging stakeholders and negotiating agreements that are acceptable to the concerned communities.

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<sup>17</sup>Ibid, p.43

<sup>18</sup>Ibid, p.48.

Special attention needs to be placed on: 1) resolving boundary disputes between villages and communes, 2) anticipating and allocating land for future agricultural expansion, 3) creating broad-based community commitment to implementing land-use plans, including the protection of conservation forests, and 4) establishing institutional mechanisms, such as strong and culturally appropriate NRM committees, within the village to monitor and enforce plan guidelines.

While “fast mapping” proved ineffective in stabilizing land use and tenure, it also appears to have generated additional conflicts by ignoring important issues or formalizing plans that were not widely accepted or acknowledged. In some cases it resulted in formation of ineffective formal committees at the expense of community ownership.

PLUP must be viewed as a component of a larger process of institutional capacity building at the community level, as land-use plans without the management capacity and authority to enforce them have little meaning. In an environment of corruption and low transparency it is community solidarity that determines how resources will be respected. At the same time, effectively implemented planning and management capacity building can lead to more sustainable land-use transitions and more stable tenure as is demonstrated by the case of Krala. As a result, the broad community participation in the Krala mapping activities, and the extensive follow-up and use of the map in community decision-making, have manifested among community members a deep sense of empowerment and a strong shared understanding around issues of resource sustainability.

More investment is urgently needed to build the capacity of civil society organizations to address land-use and tenure-change problems. Properly formed community NRM committees can play important roles in developing management plans and guiding the behavior of village families. However, to be effective NRM community members need sustained training and technical support. Network building at the district and provincial level is also proving to be an effective means of facilitating communication regarding land tenure policies.

### **Box 3: Retreating Forests – Retreating People**

*As families sell their village lands, as in the case of Mr. Phong, they are forced to go into more distant forests, once considered by the village to be protected for environmental or spiritual reasons.*

Mr. Phong one of the original members who re-established the village after the Khmer Rouge, attempted to convert his swidden fields to cashew cultivation but was compelled to sell his land to pay medical bills after falling ill. After selling his land near the village he was compelled to open new fields far from the village in the protected forest, as no other land was available. Mr. Phong's new swidden fields are located within what is considered to be the “protected forest” area as identified in the community's land-use planning map. It is on the eastern flank of the mountain which defines much of the forest. Since all of the land near the road has been purchased by outsiders and is being converted to rubber, he and many other members of the community have to travel much further from the village center and cut their fields into the old growth forests, something they avoided in the past. Before he sold his land Mr. Phong could walk to his fields from his home in about 10 minutes. Now the walk can take as much as 2 hours. Because of this Mr. Phong has relocated his entire family to his field hut where they live there for most of the growing season, only occasionally returning to the village.



**Table 7: Impact of Participatory Land-Use Planning**

|                                   | <b>Tuy</b>  | <b>Leu Khun</b>  | <b>Krala</b>  |
|-----------------------------------|---|--|---|
| <b>Land-Use Mapping Conducted</b> | SEILA program staff, working through the Department of Land, conducted PLUP map activities in 2002. It took approximately 15 total days of work to create the map. Neighboring villages were invited to participate, and agreed to boundary areas. Community members claim that they were shown the final map but were never provided with a copy. They indicate there has been no follow up from SEILA, and that neighboring communities have since disputed the agreed boundaries, claiming lands within the mapped area. | SEILA program staff produced a PLUP map of the entire Khe Chong Commune in 2003. The map identified key land uses and resources based on meetings with select village and commune leaders, but did not attempt to delineate boundaries between individual villages. This was referred to as a "fast map," to distinguish it from the more detailed (and time intensive) village level mapping. The village chief claims to have a copy of the map, but was not involved in the process, as only the former chief was consulted in that mapping effort. | Detailed land-use mapping of communal lands emerged as a gradual process of community empowerment around overall land-management decision-making. An initial community land-use map was created in 1998. Mapping training sessions were held for villagers in 2000-2001, with the first GIS map produced in 2003. The map and land-use plan was finalized in 2006 representing the culmination of nearly 9 years of concerted effort at decision making and capacity building within the community land management committee. |
| <b>Active NRM Committee</b>       | NRM committee is comprised of five members, but is largely inactive. Discussion reveals that the sole function of the committee is to attend the occasional gathering that is held when an NGO member visits the village, generally for purposes of disseminating information and encouraging community members to not sell land.   | Formed in January, 2005 through efforts of the Highlander's Association (HA) to encourage community members to preserve communal lands. The community selected 5 members to serve as the advisory committee and work with HA. Virtually all members of the community signed (thumb printed) an agreement not to sell land. HA staff claim that the committee has ceased to function, largely as a result of the death of the village chief in mid 2005.  | The NRM committee meets continually with the community and sees it self as reporting to community. The committee also meets once a week with NTFP staff as they work through the process of gaining community recognition as a legal entity (which is a preliminary step toward attainment of a communal land title). The committee also meets frequently at the request of other NGO's and communities who visit to learn from the Krala example.  |

#### Box 4: Perceptions of Land Tenure Security

*This case illustrates the challenges indigenous families faced as they have resettled after the Khmer Rouge era, adapted to commercially farming cashews, while attempting to retain control of their lands and forests as a growing number of outsiders entered their villages. The tenuous hold indigenous leaders and communities have on land and their economic vulnerability is evident.*

Mr. Romas Hleng, 58, returned with his neighbors to re-establish Leu Khun village in 1979, after the Khmer Rouge left. He has a family of six, though only one of his four children attends the community school, which only goes up to grade 4. His other three children have passed the age of attending school, and have no immediate plans of pursue an education. Mr. Hleng hopes to send his son to the Bor Keo district town school to attend school at the 5<sup>th</sup> grade and beyond, and recognizes the importance of education for his son's future, but is uncertain if he will have the means to pay the expense.

Mr. Hleng has two ha of cashew trees that were planted in 2001, one hectare of rice, and three ha of land held as secondary forest for future rice cultivation and vegetable harvesting. Although he has not planted any trees or established any other markers to show his ownership of the three ha of secondary forest he indicates that he feels reasonably secure about his land claim within the eyes of the community largely because it is well within the recognized boundaries of the village, located only about a half kilometer northeast of the village center. In spite of the problems faced by the village due to lack of resources, Mr. Hleng maintains that there is a lot of solidarity in the community, and that he does not perceive any internal disputes or tensions within the village itself. However, he did point out that people believe the spirits are angry because of the cutting of the forest.

With regard to community leadership, Mr. Hleng attributes much of the success of the community and its ability to maintain its land to the strength of the former village chief who died in late 2005. He has concerns, however, that the new chief is not exhibiting the same strength of leadership in building community solidarity. Furthermore, he considers the commune chief to be a detrimental force within the commune, often encouraging people to sell land in spite of knowing the agreement that the village members have collectively made. Overall, Mr. Hleng is proud of the fact that his community has managed to withstand many attempts to take their land. However, he remains fearful that Leu Khun might become like many of the other surrounding villages who have sold land and fallen into dispute.

As with most of his neighbors, Mr. Hleng is frequently approached with offers to purchase his land. While there are some Jarai and Tampouen middlemen who have actively brokered land deals in the district, Mr. Hleng is most often approached directly by Khmer immigrants who visit him in his fields where transactions can be made with greater discretion. Most commonly, he is offered \$200-\$300 for one hectare of land, and in some cases the offer involves a direct trade of one moto (moped) for a hectare. In all of these cases, Mr. Hleng declines the offer in keeping with the agreement that all of the families within the village have made pledging not to sell any communal land.



Romas Hleng (left) with Leu Khun village chief.



## Part 5 Lessons from Community Land Management Experiences

Part 5 seeks to compare land-use and tenure changes across the three study communities. We give special attention to the role of village and commune leaders, community level policy formulation, resource rules and regulations, and capacity to respond to illegal land transactions.

### Role of Village and Commune Leadership

The case studies indicate that the role of village and commune leaders is important in slowing or accelerating sales. Many village leaders are drawn from a pool of elders who traditionally played leadership roles within the community. By contrast, the commune chiefs are often wealthier members of the community or neighboring villages with political connections. Moreover, in some cases commune chiefs exercise significant control regarding the decision of who will become a village chief or deputy. Village chiefs in the studied villages varied in their ability to control land sales. In Krala and Leu Khun some village chiefs and elders have shown strong support for banning any land sales to outsiders (see Box 3), while in Tuy and Leu Khun other village chiefs have been under pressure to allow land sales, and even actively participated in facilitating land transfers (see Table 1). Community ability to resist illegal land sales is significantly influenced by the commitment of the village chief to developing community consensus opposing communal land sales, while changes in leadership can influence community ability to retain communal lands.

This study found a number of commune chiefs are reported to play an active role in promoting land sales and profiting from them. In the case of Krala, strong solidarity among the community and support from village chiefs have frustrated attempts to promote land sales in that area (see Box 5). Support from local NGOs has also been important in reinforcing these policy decisions. In some cases, villagers have threatened retribution if the commune chief allowed land sales in their village.

One villager noted that that their commune chief is responsible for most of the land sales that have taken place in the commune. She recalls that people in the community previously knew nothing about land sales and were not interested in such things. But the commune chief actively brought buyers to the commune and convinced individuals to sell their land. She believes that the commune chief is earning more from the land sales than are the community members who sell their land. She has heard the commune chief tell community members that the land they are farming is needed for development and will be taken from them eventually. He tells them that it is best for them to sell their land now so they can at least earn some money from it. As she has witnessed, many people are afraid of losing their land and getting nothing in return, and they readily comply with the commune chief's recommendation.

Change of leadership, opportunities for personal gain, external pressures, threats and intimidation are all factors shaping the ways in which local governments are responding to the growing tide of land sales in Ratanakiri. Village and commune leadership is a critical element either in support of sustaining communal ownership or in facilitating land alienation processes. It is essential that local government and justice systems address the problems of illegal land sales. As yet, efforts by higher levels of government to control the illegal actions of commune officials appear to have had limited impact in controlling the alienation of indigenous lands.

**Table 8: Community Leadership, Policies and Regulations regarding Village Land Sales**

|  | <b>Tuy</b>   | <b>Leu Khun</b>   | <b>Krala</b>  |
|--|--|---|---|
| <b>Village Leadership</b>                    | Breakdown of community leadership. Reportedly, former village chief was among the first members of the community to sell land.   | Weakening Leadership. Formerly strong leadership has become significantly weaker with the appointment of the new village chief in 2005  | Strong Community Control. The previous village chief, and the current chief are proponents of maintaining communal land.  |
| <b>Commune Leadership</b>                    | Commune Chief is considered to be one of the wealthiest men in the area, and is reputed to use manipulation and intimidation to help businessmen broker large land deals throughout the commune.   | Commune Chief instrumental in numerous land sales. While reports suggest that he has not been as aggressive as the Ting Chak Commune Chief,   | Commune Chief has invited village leaders to meetings with land speculators to discuss prospects of selling land but has not actively pressured the community to sell land. |
| <b>Position on sale of Communal Land</b>     | Some resistance within the community but most community members believe it is the individual's right to choose to sell their land. Communal systems largely destroyed.   | Community mostly in denial about the existence of land sales. Some community members have spoken out but many have remained silent and denied that sales have occurred.   | Prohibited. Community members are unified in their opposition to communal land sales and seek recognition for their communal land title.                                    |
| <b>Punishment for sales of Communal Land</b> | No official censure by village or commune leadership. Numerous reports of families breaking up as a result of disagreements over land sales.   | Community Protest. Some village members speaking out in opposition to land sales. Some shame and guilt associated with selling land, but no official censure.   | Strong censure for village land sales with rules that violators would be expelled from the village.   |
| <b>Communal Land Decisions</b>               | Not functioning. Village chief generally not informed of decisions to sell land. Chief claims that many community members are angry with him because he refuses to sign land sale agreements. Community members go directly to commune chief for approval of land sales. | Partially Functioning. While several community members have indicated that the village chief has approved some land sales in the village. Leaders have indicated that they have repeatedly sought the assistance of the Cadastral commission in resolving disputes with neighboring villages and have negotiated with them. | Functioning. Strong adherence to consensus building practices. No decisions made without full discussion and approval of community members.                                 |



## Community Policies and Sanctions on Land Sales

The extent to which the three study communities have formulated explicit policies on land sales varies from no policy in Tuy village to formal, written policies prohibiting land sales in Krala. In Leu Khun, community members generally reject land sales, but no formal policy has been established (see Table 8). Similarly, Krala has explicit sanctions against any community member who tries to sell their land; Leu Khun relies on peer pressure and the village leadership to discourage land sales; and Tuy has no sanctions or censure. Only through fully formulated community policy enforced by sanction can indigenous communities hope to stop land alienation given the growing market pressures in Ratanakiri. Some local NGO staff are discouraged with the inability of government, NGOs, and the communities themselves to slow the rapid pace of land alienation in Ratanakiri. Information campaigns and the dissemination of information regarding Cambodian Land Law and community forestry policies have provided some encouragement to indigenous communities under pressure from illegal land investors and commercial plantation developers.

## Land Conflicts

The process of land sales reinforces the changing perception of land as a market commodity rather than as a resource held in stewardship by the community. Sale of communal land not only changes tenure controls, but use as well. Once land is transferred it is usually cleared of valuable timber and converted to commercial crop production or held without development for future land sales. By changing the "rules of the game" community members see resources that were once a communal good, being turned into more open access resources to be used for personal gain. The commoditization of land has contributed to competition over resources which in turn is generating conflicts within the village, between neighboring villages and with outsiders (see Table 9).



A member of Tuy village stands behind the barbed wire fence separating the village from its ancestral lands.

In Tuy, growing land sales and resulting land scarcities are increasing tensions between community members. As an example, Mr. Nuk, originally from Tuy, but now living with his wife's family in nearby Kuhn Thai village, has recently returned to make a claim on an old swidden field that is currently being farmed by Mrs. Laeot Yeen. The land had previously been set aside as fallow and in keeping with the traditional practice of swidden land use, Mrs. Yeen began re-cultivating it with upland rice and fruit trees as well as began to plant cashew trees. Now that the land has been farmed by her for three years, Mr. Nuk has demanded that she pay him 50,000 R (US \$1.20). While Mrs. Yeen does not believe that Mr. Nuk has any legitimate claim to that land, and this view is validated by other members of the community, she remains fearful of his anger and has already paid 30,000R (US \$0.70) in order to appease him.

Mr. Nuk has also sold land within the village. One parcel he sold to Mr. Phong for 30,000R (US \$0.70), who in turn sold the same parcel to Khmer migrants. It is interesting to note that the growing recognition of land as a commodity is increasing tensions between community members. As a result, families are less willing to leave swidden fields fallow, opting instead for conversion to cashew production and the subse-

quent clearing of adjacent lands for new swidden. Moreover, the practice of cash transactions for land is beginning to occur within the community as well as outside of the community.

In Leu Khun Village, community members reported a strong expectation that land and forest conflict would increase in the future, creating potential for violence. They noted growing incidence of disputes over field boundaries that have to be resolved by village elders. They also noted that these issues have become tenser because there are fewer options for finding additional land. As such, they recognize that such disputes in the future have the potential to result in physical confrontations. Currently, the more difficult disputes are with neighboring villages over territorial boundaries. For example, there is a large stretch of land beyond the southern administrative boundary of the Khe Chong commune that the Leu Khun village members consider to be a part of their traditional domain, but which lies within the land of neighboring Koh Commune. Village members indicate that this land was "loaned" to the people of Toich (small) hamlet when they were permitted to establish a community on Leu Khun territory. The apparently arbitrary decision to run the commune boundary between these two communities has put a strain on their relationship and created a significant amount of confusion about leadership and authority. The land in dispute is approximately 2,600 ha. While villagers have some expectation that the boundaries will be redrawn, and that this issue will be resolved in their favor in the future, none of the NRM committee members had any knowledge about how this decision would be made. This issue is of particular concern given the very common scenario of illegal land transactions frequently occurring in areas of uncertain land tenure, with the land often being sold illegally by the party with the least valid claim to the land.

In another conflict, members of the NRM committee are concerned about a dispute between Leu Khun village of Khe Chong Commune and Yeun village in Kak Commune. The commune chief of Khe Chong commune brought the SEILA program commune PLUP map to show to the Kak Commune chief, but the Kak Commune chief did not agree with the map and refused to accept it as a legal document. The people of Leu Khun are uncertain how to proceed and hope to resolve the conflict with their neighbors either through NGO mediation, or through more traditional ritual methods.

The conflicts Leu Khun Village faces with its neighbors reflects the ineffectiveness of the rule of law and of PLUP activities (particularly "fast" PLUP mapping) in facilitating lasting agreements regarding inter-village and inter-commune boundaries, owing largely to the lack of time and effort spent on building consensus. Boundary conflicts also appear to be linked with rapid land-use change and unsustainable resource exploitation. Such conflicts may also create more opportunities for illegal land sales as there is a lack of clarity regarding resource rights and ownership. By contrast, Krala has not experienced internal or external conflicts over land, since no sales have been permitted and boundaries with neighbors were carefully negotiated.




**Table 9: Land and Forest Conflict**

|  | <b>Tuy</b>   | <b>Leu Khun</b>  | <b>Krala</b>  |
|--|--|--|---|
| <b>Emergence of land conflicts within villages</b> | Disagreements over decisions to sell land are increasingly common within families. A common scenario reported is that of sons selling their parents' land without permission.  | Tensions increasing within the community as the practice of land sales become more common. Community members note that people are becoming more vocal about condemning land sales  | Clear regulations and strong internal governance prevent the emergence of land conflicts between community members. All disputes and disagreements are settled in a public forum of all village members.                              |
| <b>Land conflicts with neighboring villages</b>    | Virtually all neighboring villages have claimed portions of land mapped as being within Tuy's boundaries, and have reportedly already sold off large portions of the claimed land.   | The community faces land conflicts on virtually all sides. In most cases, villages that have already sold off large portions of their own lands are seeking to claim Leu Khun land for both cultivation and selling.   | No active land conflicts with neighbors. This is largely attributed to the fact that all neighbors were included in extensive discussions about village boundary mapping.   |
| <b>Emergence of land conflict with outsiders</b>   | As the land along the road south of the village was cleared and fenced, community members are no longer able to access their fields that lay beyond the fenced area. They have subsequently abandoned those fields and found that they have since been claimed by members of neighboring villages. | A Khmer police officer living in neighboring J'rung village has arranged to sell 200 ha. of Leu Khun land to a developer. He has offered \$300 to each of the 16 families using that land to abandon their farms, and has made public death threats to anyone who opposes him. | No conflicts reported. Early attempts to claim village land in 1993 were met with fierce resistance by villagers. Villagers frequently receive requests to sell land, but uniformly reject these offers as a matter of public policy. |



#### **Land Alienation, Deforestation and Land-use Transitions**

These case studies indicate that as indigenous families sell their farmland they are moving into more remote forests, often those that were traditionally considered reserved for conservation or collection. As forests are cleared and land is alienated from indigenous control, local communities are becoming increasingly resource poor. This process drives a "retreat" into more remote forest areas (Box 6), as well as highlighting the reality that the pool of land and forest resources is disappearing rapidly and will be-



come increasingly scarce for future generations (Box 7). This is apparent in both Tuy and Leu Khun villages, as illustrated by Mr. Phong's experience (Box 3).

The remotely sensed data presented in Part 2 dramatically illustrate the changes in land use that have taken place in all three villages over the past seventeen years. Since the data is only for two points in time (i.e., 1989 and 2006) it does not reflect the clear acceleration of land-use change that has occurred over the past five years. It is apparent that Tuy and Leu Khun have experienced a more rapid and chaotic process of forest clearing, reflected in the widely scattered openings in the forests as seen in the 2006 imagery. Interview data reveals that such land clearings occur as indigenous households sell land located along the roads and nearer their villages and move their farms to more remote areas.

Krala, by contrast, has been able to retain their existing swidden lands, both actively cropped and fallowed, reducing pressures to move into protected forests and opening them for swidden as has been happening in Tuy and Leu Khun. Community members in Tuy estimated that one third of the 350 ha protected forest designated in the PLUP map had already been encroached for swidden, illegal logging, and establishment of new homesteads. In contrast, Krala leaders reported no encroachments in their 700 ha protected forest, a claim that appears validated in the remotely sensed images (Table 3).

Deforestation and degradation are resulting in a declining availability of non-timber forest products that are often found in older growth forest tracts where *swidden* has not been practiced for a number of decades. Such forests often possess older *dipterocarpus* trees that have reached a girth of 45 to 50 DBH, probably reflecting an age of 40 to 50 years. In areas with resin trees, the majority villagers may collect resin for commercial purposes, a practice that has expanded rapidly in the past decade. Because most of the old growth forests have been felled in Tuy and Leu Khun, the availability of non-timber forest products has been greatly diminished with a corresponding economic loss to families dependent on that income.

Loss of natural forest cover presents serious economic implications for indigenous people in Ratanakiri. Many households have traditionally generated substantial income in cash and kind from non-timber forest products. Prior to the introduction of cashews, much of a household's material needs were met through non-timber forest product collection. Leu Khun villagers indicate that there is now an insufficient supply of bamboo for their construction needs, and that they are much more likely to construct new homes from lumber that they harvest in their remaining forests (Table 11). Villagers also noted severe decline in such resources as forest vegetables, rattan, and several varieties of tree bark used for making rope. Additionally, because of the lack of large trees, they have seen a very dramatic decrease in the availability of wild mushrooms. Hunting has also been severely impacted by the loss of forests. Villagers recall that in the past there were wild pigs, monkeys and a host of birds available for hunting. But now there are significantly fewer birds, and no pigs or monkeys. These days, their primary source of wild game is small animals such as field rats. This takes on added significance as the forest has traditionally been seen as a reserve food supply at times of rice deficiency.

Forest degradation also appears to be impacting water availability. Both Tuy and Leu Khun respondents reported a decrease in spring flow during the dry season. Villagers also recall the presence of a lake in an area that is now considered paddy land that once that held water throughout the year and yielded a variety of fish. However, ever since the trees around the lake were cut down, the lake has dried up during the dry season. Villages believed that the loss of the shade from the large trees has allowed the lake to dry up, but it is also possible that increased sediment flux into the lake from degraded forest lands may also have contributed to this change.



The development of bore wells has helped address water shortages, though demand for water resources is increasing. There is no monitoring of ground water levels at the present time, though the removal of forest cover and its replacement by rubber and cashews may have a significant impact on the hydrological regime and the availability of water in the dry season.

The shrinking availability of land for swidden farming is also reported by community members in all villages. In part, this reflects the conversion of swidden land to cashew cultivation and permanent agriculture, though it also is a result of land sales. In Tuy, of the 550 ha designated as swidden land or fallow under the PLUP map of 2004, only 170 ha remains with an additional 100 ha taken from new sites in the "protected forest." Little land has been converted to paddy cultivation, largely appropriate land is extremely limited. The loss of swidden is creating food shortages, since most staple foods are produced in the swidden fields (see Table 10).



Women filling water jugs at a communal spring in Krala village.

Cashews have expanded rapidly over the past decade and now cover substantial areas in all three villages. Cashews carry fewer costs and less risk than other commercial crops like rubber or coffee, providing an entry way into the cash economy for low income swidden farmers. In Krala, the NRM plans allow for a substantial increase in cashew area over the next ten years. Krala has shown the most rapid and equitable expansion of cashew cultivation among the three communities. Still, while cashews are increasing cash flow, the combination of poor market access and generally low prices means that families currently earn as little as \$200 to \$300 per year from their annual cashew harvest. However, because they have allocated much of their food production land to this crop and reduced the number of productive species from several dozen to a single cash crop, they may have actually decreased their food security, becoming more vulnerable to climatic and market uncertainties.



Cashew groves have been planted in areas previously clear cut by loggers.

**Table 10: Changing Forest Use and Condition**

| Village  | Tuy   | Leu Khun   | Krala   |
|--|---|--|---|
| <b>Forests</b>   | Largely degraded. Only remaining old-growth forests areas defined by high-slope areas surrounding the mountain. Other areas with flatter slopes are being actively cleared for swidden  | Mostly degraded. Timber for domestic use and most non-timber forest products found only in areas designated as protected forest.   | Well preserved old-growth forest. Abundant regrowth in areas of secondary swidden fallow.   |
| <b>Protected forests</b>   | Designated protected forest land is about 350 ha. In practice, the land is not protected and is being actively logged and cleared for swidden. Estimated 100+ ha of protected forest cleared for swidden as of 2007.  | About 70 ha designated as protected forest (according to commune PLUP map). In practice no protection exists and all remaining forest areas are considered multiuse forest.  | About 700 ha reflected in updated 2006 land-use map. Interview results suggest strong commitment to maintaining protected lands.  |
| <b>Commercial and illegal logging</b>                                      | 1985-89 heavy commercial logging by Vietnam. 1993-present Cambodian army, police and neighboring communities engaged in illegal logging with 1-3 trucks of lumber departing protected area each day   | 1986-1992 heavy commercial exploitation by Vietnam<br>1993-Present Cambodian military, police and private parties are involved in illegal logging. Several trucks a week bring lumber from Se Leu Mountain protected forest. | No commercial logging conducted within Krala land. However, Hero Concession was active 1996-2000 on nearby land. Very little illegal logging, however, some serious reports from surrounding villages and communes. |
| <b>Plantations</b>   | Cashew production: 140 ha estimated current cashew land (no official designation of limits or locations). Rubber : 50 ha of old rubber (colonial era) controlled and harvested by outsiders. 150 ha. of new rubber trees planted in 2004. (owned by outsiders)<br>180 ha. currently being cleared and planted with new rubber | Cashew Production: 110 ha estimated current cashew land (no official designation of limits or locations). Cashew lands generally located within 500m of road   | Cashew production: About 650 ha designated for cashew (based on planning map)<br>About 190 ha estimated current cashew lands.   |
| <b>Availability of swidden lands</b>                                       | 550 ha designated for swidden cultivation (in 2004 PLUP map). However: 80 ha claimed by Kroich Village, 160+ ha sold to outsiders and 140 ha planted in cashew. 170 ha remains for swidden. (based on land designated as swidden on PLUP map). Estimated 100 ha of protected forest area recently converted to swidden        | 1000+ ha considered available for swidden.<br><br>Estimated 320 ha currently cleared (in use) for swidden.   | About 500 ha available based on community land-use map. Estimated 240 ha currently used for swidden.  |
| <b>Availability of timber and non-timber forest products for local use</b> | Severe shortages of many non-timber forest products, particularly wild game, rattan, bamboo   | Some reduction in non-timber forest products noted. Serious shortfall in availability of rattan and wild mushroom, and some tree barks used for rope.  | No notable shortages of non-timber forest products. Some community members report earning income from non-timber forest product collection (rattan, bamboo, forest vegetables)                                      |



### Box 5: Dealing with Land Speculators - Challenges of a Village Chief

Mr. Doung Ven has been the Krala village chief since 1987 when the government selected him because of his ability to read and write Khmer. As part of his responsibilities, he must attend regular meetings at the commune council office, and is frequently called upon to meet with visitors from other communities and organizations. For all of his responsibilities, he is supposed to earn 10,000R (US \$2.50) per month, however at the time of this interview he had not been paid for five months. As the village chief, he is often confronted with efforts to acquire village lands. As recently as December 2006, he attended a meeting at the Poey Commune Council, along with the chiefs of the seven other villages, where they were presented with an offer from a businessman who wanted to develop a rubber plantation within the commune.



Mr. Doung Ven presents the PLUP map of Krala Village.

In that meeting, they were hoping to convince the village chiefs to sell their community land. But Mr. Ven, informed

the representative that he personally had no power to make such an agreement, emphasizing that it was up to the members of the community to decide if they want to sell land. All eight of the village chiefs replied similarly. The company, the name of which he does not know, returned again, to ask them individually and to request a meeting with the entire community.

Krala has also established strong controls and regulations prohibiting the sale of individual land. According to Mr. Ven, any member of the community who is found to have sold land would be banished from the community and lose their rights to their land. He says that he believes members of the community take these agreements very seriously, and he is not worried about people selling land. However, he remains concerned that commune and district authorities may try to sell or claim the lands and indicated a determination to fight any such attempts.

He would like to relinquish his duties as chief, and has made this request to others in the community and the commune. He explained that the demands of his position as village chief have prevented him from attending to his rice and cashew fields and this has limited his ability to provide for his family. He says that he is tired and needs to rest but does not want to disappoint his community. In spite of this request, however, he has been repeatedly selected by the commune chief and has accepted this responsibility out of a sense of duty.

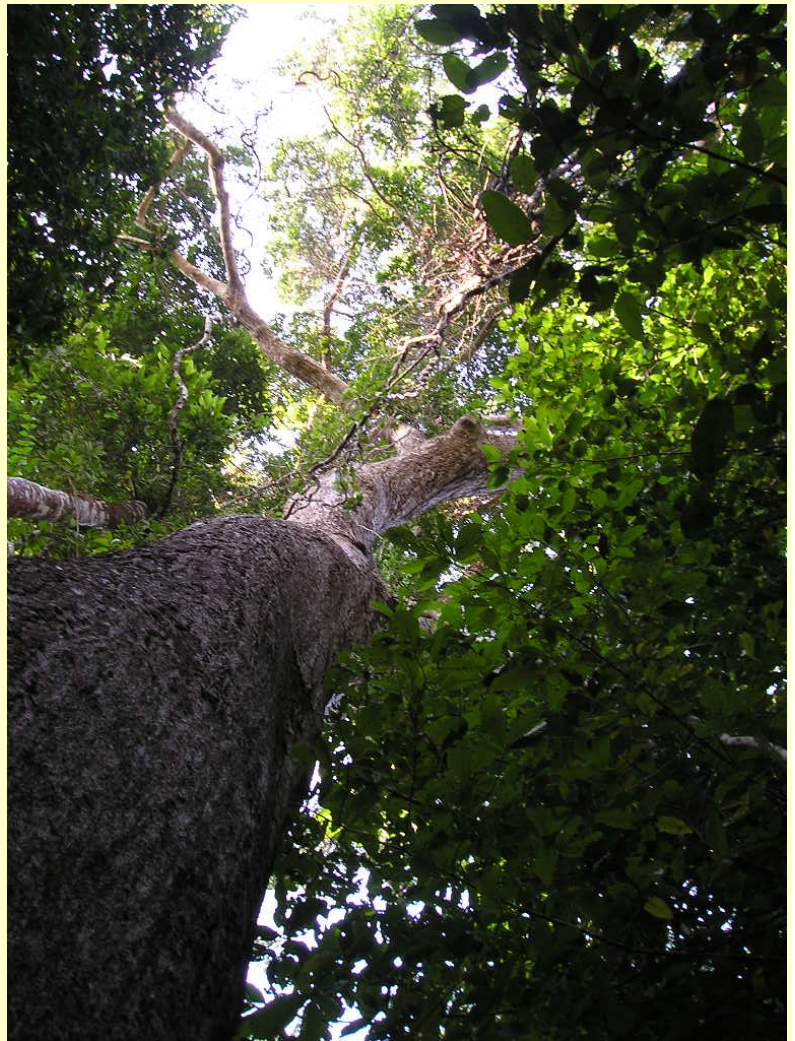


## Box 6: Land for My Grandchildren

Mrs. Romas Lopp of Leu Khun Village is worried about how her children will support themselves as land becomes increasingly scarce and prices rise. There are six people in her family including one son and four daughters. Her husband died six years ago. All of the children are now married and live in the village. She has no land of her own to give them, and remarked that in the past this was not necessary as there was enough land in the village for young people to clear their own fields when they were ready to start a family. She recognizes that this may not be possible in the future, and is worried about what her grandchildren will do for land.


One of her daughters still lives with her because her son-in-law is working in the gem mines and comes home very infrequently. She is worried about her daughter because even though her husband is working, he spends his money on gambling and drinking and does not send any money back for his wife. Mrs. Lopp does not expect to have enough rice to last her through the year. She is not sure what she will do for food but hopes that she will be able to support herself through the income she earns by making and selling rice wine. Each time she makes a batch of rice wine she brews 10 liters which takes about 20 cups of rice. She says that this is the easiest way of making money and she never has problems selling her wine.

She considers that life in the village is more difficult now than it was ten years ago. For her, there was more food to eat and less concern about the future. Now, she feels that there is less harmony within the village and more violence and problems within the families. There is more drinking and gambling now than in the past. She believes there is more violence within families and fights that occur at public celebrations. People are making more wine than they did in the past, and the Khmer families who maintain shops in town sell beer and other alcohol. She also feels that there is more crime in the village, and that people need to be much more concerned about their possessions than in the past. She indicated that it is not uncommon for livestock, or bicycles, to be stolen which she believes are being taken and sold in other towns. She senses that people are stealing these items to gain money so that they can drink. In the past, Mrs. Lopp said that people never even thought about stealing but outsiders who have married into the village introduce these ideas and now people know that they can steal



Spirit Forest in Ratanakiri.





things and easily gain more money.

Mrs. Lopp is recognized by many as a mediator who can help settle domestic disputes. In some cases when people consult her to help resolve disputes they donate some money. She feels that she has a strong voice in the village and is free to speak out in community meetings. She has been most active in the establishment of the community health center, where she is a traditional birth attendant, and has been involved in delivering many of the children within Leu Khun and several of the surrounding villages.

## Part 6 Future Directions

Throughout mainland Southeast Asia, upland watersheds are being transformed as roads create market access and traditional forms of agriculture and forests are replaced by commercial plantations and conservation areas. The transformation of land use and land tenure in the region raises numerous questions regarding impact on the local culture, economy, and environment. The extent to which these upland transitions can be guided in ways that are supportive of social equity and environmental service goals depends to a great extent on the effectiveness of land-use policy formulation and implementation.



### Land-Use Change Scenarios for Ratanakiri

Lebel<sup>19</sup> describes 4 scenarios for alternative futures for upland watershed in mainland Southeast Asia. We have adapted these for this discussion (Fig. 1). The following pages describe the four land-use scenarios

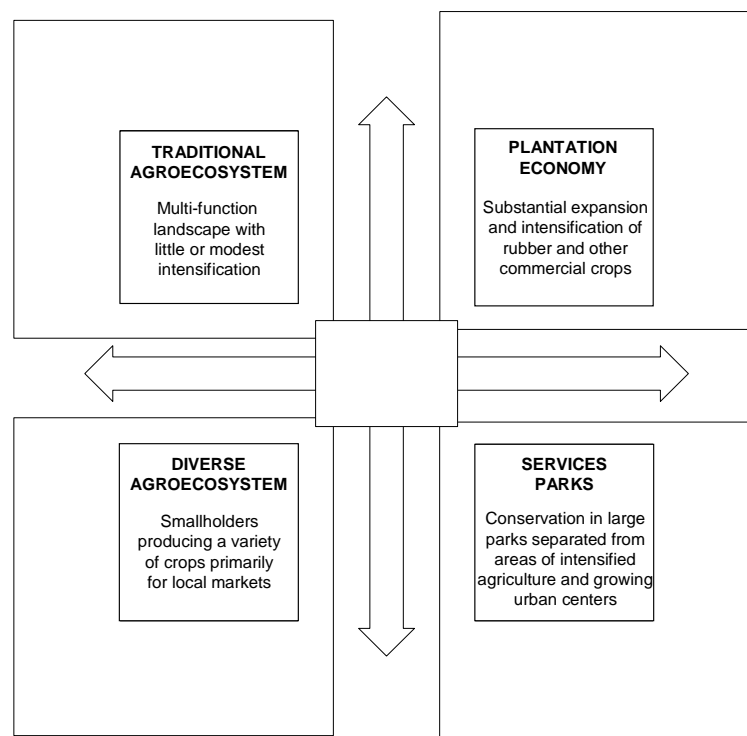


Fig. 1 Scenarios of Future Land-Use Changes in Ratanakiri

#### Plantation Economy

In this scenario economic growth is driven by agricultural businesses. While farmers are interested in planting a number of market crops, rubber (*Hevea brasiliensis*) is the major commercial crop replacing traditional agriculture and secondary forests in the Southeast Asian region, a direct result of strong market demands from China, the world's largest consumer.

Low  
Connectivity  
RURALIZATION  
Anti-modernist

FIELDS and FALLOWS

<sup>19</sup>Lebel, L. 2006. Multi-level scenarios for exploring alternative future for upper tributary watersheds Mainland Southeast Asia. Mountain Research and Development 26 (3): 263-273.

Multi-function  
landscape with  
relatively low emphasis  
on conservation of  
trees, only modest  
intensification



In Cambodia, the Ministry of Agriculture, Forests and Fisheries (MAFF) plans to expand the area under rubber cultivation from 50,000 ha to as much as 800,000 ha by 2015 (or 4.4% of the total land area of Cambodia).

Some of the implications of this scenario may be that the state will introduce policies that facilitate profit-making by agricultural businesses that may or may not include smallholders.

The issuance of Economic Land Concessions could result in the transfer of land and forest resources previously utilized by local communities to external investors<sup>20</sup>. Over time, property rights may become predominantly vested in private firms; and as ethnic minorities lose ownership of their land they may become a source of flexible, low-cost and mobile labor. A plantation economy would drive investments in road, transport, and communications infrastructure. But the large scale expansion of monoculture cropping could increase susceptibility to pest and disease outbreaks. Farmers' livelihoods would become increasingly vulnerable to changes in the market, climate, and other variables.



Khmer farmers transporting materials to their newly purchased homesteads on Tuy village land.


### ***Parks and Conservation***

In this scenario economic growth might unfold primarily through tourism that places a high value on forests, wetlands, rivers, and perhaps even 'ethnic' diversity. Cambodia has already established Virachey National Park in Ratanakiri and Stung Treng Provinces. This scenario could result in the government acquiring property rights from indigenous people and small holders; a segregation of areas of production and living from areas of nature and recreation; labor being drawn away to urban and peri-urban agricultural areas; and investments in transportation and communication for tourism. A park scenario could also be envisioned that leaves local people on their land to practice traditional land-use practices. The ability of local people to control their own lives, however, might be constrained.

Integrating communities into national protected area systems could also be explored through the establishment and recognition of Community Conservation Areas (CCAs) known in Cambodia as Community Protected Areas (CPAs). Many forest-dependent communities have traditions of forest protection including sacred groves, burial forests, water source forests, and shelter forests which could be strengthened through Government policies and programs. None less, even formal protected areas like Virachey are vulnerable to alternative uses. Recently, mineral exploration rights were leased to private firms for much of Virachey National Park. In coming decades, as economic growth accelerates in Cambodia, it will take substantial political will to retain areas designated for conservation.

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<sup>20</sup>Cambodia Office of the High Commissioner for Human Rights. (2007) Economic Land Concessions in Cambodia: A Human Rights Perspective. (United Nations: Phnom Penh, Cambodia).



Conservation initiatives can play important roles in either supporting indigenous stewardship and forest protection systems or in displacing them. Much depends on the conservation strategy that is adopted by government and implementing agencies. Communities can play very strategic roles in controlling important drivers of deforestation, especially if their resource rights are recognized under conservation program agreements.

### ***Traditional Agroecosystem***

For centuries, Ratanakiri, like much of the uplands of mainland Southeast Asia, has been managed by indigenous hill tribes who practiced a variety of forms of long rotation agriculture, supplemented through forest gathering and hunting. These systems are being replaced as the need for cash by upland communities is guiding them into more sedentary cash crops, while growing population pressures and land prices limited the availability of fallowed forests needed to support swidden farming rotations.

Lebel (2006) argues that given current political and economic trends traditional agroecosystems will continue to disappear unless there is a progressive lowering of private and public investments in regional infrastructure, either because these funds are targeted elsewhere or because of a prolonged global recession. This scenario could reflect anti-globalization movements, dwindling agricultural trade, and an expansion of local exchange systems. Some of the implications of this scenario could be food security problems and land conflicts, as well as rediscovery of local knowledge and appropriate technologies. It could also portend a rural bias in state policies. Rising costs for petrochemically based fertilizers and pesticides, in addition to increasing fuel and transportation costs may also create financial incentives for local communities to retain more traditional, self-sufficient farming systems.

### ***Diverse Agroecosystem***


Under this scenario, significant but diversified economic growth occurs, but it would draw on local comparative advantages in agriculture, tourism, and perhaps mining rather than on the adoption of more uniform technologies and production systems. This scenario would require government policies that recognize the rights of minority peoples, integration of the national park into the wider landscape, and development of transportation and communication systems sufficient to meet the needs to the crops grown and agroecological tourism. This would appear to be the most 'ideal' of the scenarios outlined here in terms of protecting local resource rights and sustainable development. Farmers' livelihoods would be based on secure tenure rights as well as diversified agricultural production for local and international markets.



## **Conclusion**

As land is increasingly viewed as a marketable commodity, especially if planted with valuable crops like cashew or rubber, economic incentives are created to develop forest lands for income or for sale. Land as a market commodity conflicts with indigenous land management concepts that view land and forests as a communal resource to be kept intact for future generations. Demographic growth, both through natural increase and immigration, combined with corruption, economic expansion, challenges the viability of more traditional land management models as natural resources become scarce. Nonetheless, there are many indigenous communities around the world profitably and sustainably managing extensive areas of land held under communal tenure while providing significant national benefits and environmental services. Indigenous management and communal ownership do not necessarily conflict with modern commercial agricultural or forestry production systems, and can in fact enhance agricultural transitions and sustainability.





Indigenous communities in Ratanakiri are gradually shifting their land-use systems to reflect a greater emphasis on cash crops, especially cashews. In Krala, by retaining communal ownership the village has been able to accelerate cashew planting when compared to neighboring communities and has achieved a high level of equity in the process. An effective process of land-use planning ensured that the Krala community retained conservation forests, as well as a sufficient production forest reserve to allow for continued swidden and cashew expansion area. This experience stands in sharp contrast with Tuy, where land tenure insecurity and poverty have led to a rapid process of land alienation forcing local villages to open new fields in remote forests that were considered “protected areas” in the past. In Tuy and Leu Khun, the formulation of “participatory land-use planning - PLUP” documents has had limited effectiveness in guiding land-use change and protecting indigenous land rights, though in the case of Krala, it is apparent that these tools can be effective if based on extended community capacity building

There are, however, new legal tools that can be used to stabilize the tenure situation in Ratanakiri and limit illegal land sales. Over the past decade, the Royal Government of Cambodia has drafted a new Land Law, Forest Law, and Community Forestry Sub-Decree, all of which have elements that could help insure more equitable and sustainable use of its natural resources. Unfortunately, due to a lack of financial and human resources and constrained by competing policy and political agendas, these policies and legislation has not been effectively operationalized and implemented. The RGC, with support from the donor community, needs to move forward proactively to utilize existing legal mechanisms to support indigenous community efforts to stabilize forest and land resources over the coming decades.

It is clear that land use is changing rapidly in all three study villages, reflecting broader patterns operating in Ratanakiri and other parts of the uplands of mainland Southeast Asia. Some of this change reflects a broad-based agricultural transition from forms of swidden farming to commercial cash cropping, especially the adoption of cashew trees. The commercialization of farming systems has created a new source of income for many indigenous families, while at the same time stimulating land markets and accelerating land alienation. Communities like Krala, that have strengthened their indigenous institutions and established clear policies on land use and tenure, are successfully building on new market opportunities while sustaining their forest resources and cultural institutions. By contrast, communities like Tuy are being rapidly transformed into areas where villagers sell their land and migrants move into the areas. At the present time, many Ratanakiri villages are like Leu Khun, struggling to maintain community lands and forests in the face of growing pressures. Whether these communities will share the fate of Tuy and experience a chaotic pattern of land-use and tenure change, or stabilize their resources like Krala and systematically move into new modes of production depends on a number of factors. Even Krala may succumb to disintegration if social systems are not respected.

A key variable is the extent to which these communities will receive support from outside agencies including both NGOs and government programs, and receive some protection from illegal land speculators. In all study areas, villagers noted the importance of NGOs in helping them to retain their communal land and learn how to deal with local government and market forces. The study also showed that long term, sustained community building is a key to success in establishing viable community institutions that can guide land-use and tenure policy making.

Local NGOs have made a tremendous contribution to indigenous communities in Ratanakiri and their capacity also needs to be increased, both in skills and coverage.

They also need to find ways to integrate further with indigenous institutions to gain a greater degree of community ownership. Community networks that are less dependent on non-indigenous structures need to be fostered to further strengthen civil society institutions in Ratanakiri.

Finally, local government officials and community leaders require training and guidance in national land policy and an open and transparent framework for dialogue at the commune, district, and provincial level. There is an urgent need to clarify land and forest resource management rights and responsibilities throughout the province, especially in an effort to protect the ancestral domain claims of the region's indigenous communities. The Forestry Administration has the role and responsibility to demarcate the state public forest domain and to determine which areas are suited to Forestry Administration Recognized Community Forestry. The Forestry Administration also has the role of coordinating with the Ministry of Land Management, Urban Planning and Construction in order to delineate land for inclusion in communal titles of indigenous communities. While much of the legal framework is in place to begin establishing recognized community forestry sites and to begin issuing communal titles, the priority must be placed on the mobilization and strengthening of communities.

Economic Land Concessions need to be kept out of indigenous peoples areas. ELCs are creating conflict and causing displacement, while apparently not proving to be effective stimulants for economic growth. As a recent United Nations report concludes:

*Economic Land Concessions have not led to increased agricultural productivity or economic growth in Cambodia, and large areas of conceded land have been left idle or under utilized. As recommended by the World Bank poverty Assessment 2006, secure land title and family-based or smallholder agriculture would improve development outcomes for rural communities. Community-based initiatives for land and natural resource management should also be prioritized<sup>21</sup>.*

The landscape of Ratanakiri is being transformed as forests are being cleared at an estimated annual rate of 5 percent along Highway 78 that runs from the Mekong River in the west to the Vietnamese border in the east. This study indicates that traditional communities in Ratanakiri have lost nearly 40 percent of their forests over the past 16 years.

In Tuy, at the current rate of clearing, all village forests will be gone by 2018. Land purchases by outside investors, mostly illegal, are rapidly displacing local families who are driven further into forests once zoned for conservation in order to create new agricultural lands. Community respondents in Tuy estimated that nearly 80 percent of households have already sold their land to migrants and investors, many times with coercion being a significant factor. As forests are cleared, the land is being replanted in rubber and cashews.




Tuy women and children return from the forest.

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<sup>21</sup>Ibid, p.22





While processes of forest conversion to estate crops and indigenous land alienation are most advanced in Tuy, other communities are following these patterns closely and they are spreading throughout much of the province.

The problems presented by this rapid change relate to issues of social justice and continuity, economic equity, and the provision of environmental services. Land alienation is a classic problem for indigenous peoples.

Loss of ancestral domain leads to an erosion of cultural identity, especially for cultures that hold their land and forest resources communally, as do the peoples of Ratanakiri. Illegal land purchases and the leasing of large economic concessions are increasing rapidly, often facilitated by local government officials in exchange for commissions. Disempowered and impoverished communities urgently require implementation of both policies and programs that protect them from exploitation. This needs to start at the most basic level, with implementation of the Cambodian Constitution and the 2001 Land Law before the development of new policies and laws<sup>22</sup>.

The case of Krala demonstrates that supportive measures by government and civil society organizations can create environments where indigenous peoples can retain their cultural identity while successfully participating in a market economy, supporting national economic development goals, and implementing sustainable agricultural transitions. Community management needs to be strengthened to deal with increased conflicts over land and forests. In Ratanakiri, the traditional decision making unit for governance and conflict resolution is at the village level. The Royal Government of Cambodia already has the necessary legal and policy framework in place to protect forest-dependent peoples' resource rights. Now the Government must demonstrate the political will to actively enforce and implement this framework. The people of Ratanakiri possess an in-depth knowledge of their environment that has tremendous potential value for informing management decisions as well as for playing an active role in Cambodia's economic growth.

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<sup>22</sup>In India, during the colonial and independence era, national legislators and policy makers adopted laws to prohibit the sale of land in areas designated as scheduled tribal areas in regions like Northeast India and the central tribal belt.

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### **Dennis McMahon**

Dennis McMahon is living in Phnom Penh Cambodia, where his work is focused on managing and preventing conflicts at the individual and community level.


Much of this work is aimed at the resolution of conflicts surrounding community efforts at protecting natural resources. He received his MS in Geology with an emphasis in soils and geomorphology from New Mexico Institute of Mines and Technology. As part of his research, he investigated soil, vegetation and land surface interactions in a small drainage basin in central New Mexico as a way of demonstrating systematic variations in those properties as a function of landscape position. Mr. McMahon also worked as an environmental scientist with the Desert research Institute in Reno Nevada, where he investigated the effects of human disturbances on soil hydrology and vegetation in the desert regions of the United States. In addition to his research activities, Mr. McMahon has also served as a Peace Corps volunteer, working on water resource management projects in Mali, West Africa, and has subsequently held several positions with the Peace Corps, including technical trainer, interim program director, and public affairs specialist.

**Mark Poffenberger, Ph.D.**, is Executive Director of Community Forestry International, a non-profit organization based in California. He has spent over thirty years studying community forestry systems in Asia and designing supportive programs. His most recent book is *Communities and Forest Stewardship: Regional Transitions in Southeast Asia*. His other books include *Village Voices*, *Forest Choices*, *Keepers of the Forest*, and *Patterns of Change in the Nepal Himalaya*. He also founded and directed the Asia Forest Network in the 1990s and lectured at the University of California at Berkeley.

### **John Vogler**

John Vogler received BA and MA degrees in Geography from the University of North Carolina (UNC) at Greensboro and UNC at Chapel Hill, respectively. He is currently the geospatial information technologist for the Pacific Emergency Management, Preparedness, and Response Information Network and Training Services (Pacific EMPRINTS) program at the University of Hawai'i at Manoa. Before joining Pacific EMPRINTS and while working on the project described in this report, Mr. Vogler was the spatial information technology specialist in the Research Program at the East-West Center (EWC) in Honolulu. At the EWC, he worked closely with Dr. Jefferson Fox on several population, health, and land-use change projects based in Southeast Asia. He also managed the spatial information laboratory and provided center-wide geospatial data collection, management, mapping, and analysis services. Mr. Vogler has over twelve years of experience in the field of geographic information science and technology. He has exten-





sive research project experience, including building and managing GIS databases, developing and implementing geospatial data collection and analysis strategies, and conducting field- and remote sensing-based land use mapping in a variety of international settings.



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