

Settlement and Agriculture

in and adjacent to
Virachey National Park



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This report is based on:

Ironside, J. and Baird, I. G. (2003): Wilderness and Cultural Landscape: Settlement, Agriculture, Land and Resource Tenure in and adjacent to Virachey National Park, Northeast Cambodia. - Report for Biodiversity and Protected Areas Management Project, Phnom Penh, 144 pp.

Land-use map of Virachey National Park 2001-2003, produced by the GIS Unit of the Ministry of Environment, June 2003.

Additional information and mapping by the Biodiversity and Protected Areas Management Project, Ministry of Environment.

Cover picture: Kavet woman. Above: Woven basket, Rok Village - Koklak Commune, © BPAMP 2005.

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Ministry of Environment



Biodiversity and Protected
Areas Management Project



World Bank



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Acronyms

BPAMP	Biodiversity and Protected Areas Management Project
GIS	Geographic Information System
NTFP	Non Timber Forest Product
VNP	Virachey National Park

Disclaimer: The findings, interpretations and recommendations expressed in the executive summary included in this report belong to the authors of the full report on which this summary is based, and do not necessarily represent those of the Biodiversity and Protected Areas Management Project, or the Ministry of Environment.

Introduction

Virachey National Park (VNP) is one of the priority areas for conservation in Southeast Asia. The park is located in Ratanakiri and Stung Treng Provinces in northeastern Cambodia (Fig. 1), covering an area of 3,325 km² and protecting flora and fauna of international conservation importance. The elevation of the park ranges from 100 m along the western boundary to 1,400 m near the border with Viet Nam and 1,500 m near the border with Laos. The streams from the mountains, which drain into the Mekong, contribute significantly to the flow of the Mekong River. A high percentage of ethnic minority peoples live in and around Virachey National Park. It is estimated that approximately 4% of Cambodia's total population belong to ethnic minority groups, about 16% of which live in Ratanakiri Province.

Virachey National Park¹ was established in November 1993 by Royal Decree for "its potential scientific, educational and recreational values". VNP is part of Cambodia's National Protected Area System, established by King Norodom Sihanouk through Royal Decree, covering about 3.3 million hectares within 23 Protected Areas, including National Parks, Wildlife Sanctuaries, Protected Landscapes, and Multiple Use Areas. The Ministry of Environment is the government agency responsible for the management of these protected areas.

The Ministry of Environment is implementing a six-year Biodiversity and Protected Areas Management Project (BPAMP). The Project started in early 2000, with the aim of (1) developing and testing proactive measures to minimise unsustainable exploitation and degradation of the biodiversity of national and global significance in the Virachey National Park, and (2) using the experience gained from Virachey National Park to help formulate institutional models for the development of the National Protected Area System of Cambodia. BPAMP is funded by the World Bank, the Global Environment Facility and the Royal Government of Cambodia.

"The mission of Virachey National Park is to conserve and sustainably manage the natural and cultural resources of the park in partnership with local communities and other stakeholders for the benefit of the people of the local communities and Cambodia as a nation." (Virachey National Park Management Plan 2003 – 2007, p. 9).

The migration patterns of minority people living in and around Virachey National Park, and their traditional land-use, have not been fully documented. The Community Development Component of BPAMP, therefore, commissioned a study to (1) identify information and material concerning migration patterns and traditional land-use among indigenous communities living in and around Virachey National Park, and (2) to assess the information, identify gaps, and recommend further studies and possible management actions. The study resulted in the report: Settlement, Agriculture, and Land and Resource Tenure in and adjacent to Virachey National Park, Northeast Cambodia. - Report for Biodiversity and Protected Areas Management Project, Phnom Penh, 144 pp. (Ironsides, J. and Baird, I. G. 2003).

Ironsides and Baird (2003) provide a historical land-use map depicting the situation in 1958/59. The GIS Unit (Geographic Information System) of the Ministry of Environment prepared an up-to-date land-use map² in 2003.

This report begins with the executive summary from Ironsides and Baird (2003). The next section uses the maps from the sources listed above to illustrate migration patterns and changes in land-use described by Ironsides and Baird (2003).

¹Before Virachey National Park was officially established in 1993, IUCN referred to the proposed protected area as Hondrai Sou, an area bigger than Virachey National Park (IUCN 1990: 1989 United Nations List of National Parks and Protected Areas. IUCN, Gland, Switzerland, and Cambridge, UK).

²Production of this map was commissioned by BPAMP as base-line data for the development of a 5-year Management Plan for Virachey National Park.

Wilderness and Cultural Landscape:

Settlement, Agriculture and Land and Resource Tenure in and adjacent to Virachey National Park Northeast Cambodia

J. Ironside and I. G. Baird, 2003

Acknowledgements

We would like to extend a special thanks to all the *Brao*, *Kavet*, *Lun* and *Kreung* indigenous people who provided us with valuable information used directly or indirectly to complete this study. In particular, we thank Mr. Van Son, an ethnic *Brao* from Taveng Leu Commune who works in Kok Lak Commune for NTFP Project. He provided much information about the situations in Kok Lak and Taveng Leu Communes. Acknowledgement must also go to Mr. Mathieu Guerin who provided comments on the text and assisted with acquiring aerial photographs from France. Thanks also go to the director of the Biodiversity and Protected Areas Management Project (BPAMP), Mr. Meas Sophal; the team leader of the Community Development Component of the BPAMP, Mr. Kim Sovann; the director of Virachey National Park (VNP), Mr. Koy Sokha; and members of the Community Development Component based in Siam Pang, and to Mr. Glenn Morgan, Mr. Graeme Brown, Dr. Klaus Schmitt and Mr. Meas Sophal for providing comments on the first draft of this document. The authors are grateful for the information and assistance that has been openly supplied to them by the BPAMP and hope that this report is seen as a joint effort in the interests of community development and biodiversity conservation in and around Virachey National Park.

The authors also take full responsibility for any errors in the historical and cultural information provided in this report. Mistakes in the translation of any of the French material used in this report are the responsibility of the first author. The first author prepared the maps. Community information in this report is the intellectual property of Taveng Leu, Kok Lak and Santapheap Commune communities.

Executive Summary

Introduction

This report outlines the links between the people and the land that is now Virachey National Park, in Stung Treng and Ratanakiri Provinces, northeast Cambodia (Fig. 1). Cambodia's largest National Park is and has historically been one of the remotest corners of the country, but to the indigenous *Brao* and *Kavet* peoples who have lived there for centuries, it is the heartland of their culture and the centre of their world. At the same time as being remote, or because of this, the Virachey area has also been a strategic location in the conflicts between surrounding countries, as well as colonial powers that have tried to assert their control and influence over the area. This report attempts to put into historical context the way that the people of what is now VNP have had to adapt to and accommodate these changing geo-politics and hopes to show that given the wars that have swirled about them, they have shaped history as much as it has shaped them.

This report also uses the Virachey context to analyse the contrasting views between central and local management and attempts to define what is the best mix of these for effective biodiversity conservation, as well as cultural and livelihood protection. This study is concerned primarily with the broad *Brao* ethnic group, including the *Brao*, *Kavet*, *Kreung* and *Lun* sub-groups, as Virachey is the traditional home of these people.

The main objectives of this study therefore are:

1. To summarise the existing information concerning traditional land use and the historical movements and settlement patterns of indigenous communities living in and near to VNP.
2. To assess this information, identify gaps and recommend further studies, or possible actions that VNP could undertake in order to make informed decisions concerning park boundaries and zones as well as possible support to local indigenous communities in terms of possible land tenure instruments.

This study focuses on three out of nine Communes bordering VNP:

- Taveng Leu Commune, Taveng District, Ratanakiri Province
- Kok Lak Commune, Veun Say District, Ratanakiri Province
- Santepheap Commune, Siam Pang District, Stung Treng Province

Studies such as this one can make an important contribution to effective protected area management, as they build greater understanding of local peoples beliefs systems and management practices. This report therefore attempts to explain the issues related to land and resource use and tenure of people living in and around VNP. The historical analysis in this report shows that people and nature in VNP have long been interacting. These interactions cannot easily be separated and need to be understood for effective biodiversity management. A key part of successful and sustainable park management in Virachey is to understand the social processes that enable local people to conserve and enhance biodiversity through their livelihood systems.

This report argues for improving partnerships with the people of the area as the most effective, economic and sustainable way to implement biodiversity conservation. Conserving biological diversity requires addressing both natural and human aspects. As part of this partnership between the central and local level, this report also argues that the *Brao* and *Kavet* indigenous communities should be given the role of park gatekeepers, as this is their traditional territory. The historical record of relationships between the local and the central level in this area, however, indicates that new approaches are required in communications, decision-making and in developing and implementing management plans. This report argues that it is in the interests of Biodiversity and Protected Area Management Project, VNP and the country as a whole if local cultures and ways of life are better understood and their concerns and substantial local knowledge are incorporated into VNP management.

Historical Overview

Historical records dating as far back as the 4th century A.D. mention trade relations between coastal towns and the highlanders of present-day Northeast Cambodia, with mutual exchanges between the highlanders and successive *Khmer* Kingdoms lasting until 1859. Historically trading in slaves by the *Khmer*, *Lao* and *Siamese* kingdoms has been an important activity, with reports from as far back as the 13th century mentioning that the slaves that fed the markets of several areas largely came from highland areas of southern Laos, northeastern Cambodia and central Viet Nam. This long-practiced slave trade particularly devastated highland groups.

In 1863, King Norodom was forced into making Cambodia a protectorate of France, and in 1893, after a short war with the *Siamese*, the *French* took definite possession of *French* Indochina. Slave trading was replaced by colonial rule, though in many areas highland groups actively resisted these new rulers. By 1953, at the end of the *French* colonial administration, the turbulent and independent minded tribal groups of present-day VNP had been reportedly “subdued”.

The new province of Ratanakiri was established in 1959, after being extracted from Stung Treng Province. In the early 1960s, some of the *Brao* sub-groups populating present-day VNP were subjected to the government’s development plans, with many being forcibly moved to the lowlands where they could be educated in *Khmer* language and culture. However, Khmerisation efforts were not popular or very successful, and fighting soon broke out over the government’s attempts to establish rubber plantations using forced labour. The Khmer Rouge exploited this resentment and highland groups formed a “marriage of convenience” with them. In June 1970, the Lon Nol government pulled 9,000 troops out of the province, abandoning it to the Khmer Rouge.

Initially, Khmer Rouge rule was not particularly harsh in northeast Cambodia, but it became stricter and more draconian as time passed. The *Brao* people in Taveng became particularly unhappy, and in March 1975 more than 3,000 *Brao* people, including almost all of the population of present-day Taveng and part of eastern Veun Say Districts fled to Viet nam, and later half of these people went to southern Laos. Others soon followed. After the *Vietnamese* liberate Cambodia in late 1978 to oust the Khmer Rouge from power, *Kavet* people from Siam Pang also fled to Laos.

In the early 1980s, the *Brao*, *Kavet*, *Kreung* and *Lun* refugees in Laos and Viet nam began returning to Cambodia, and by the late 1980s and early 1990s, almost all of the people presently living in Kok Lak, Santepheap and Taveng Leu were located in their respective communes, but due to security concerns, all were situated adjacent to or not far from the Sekong and Se San Rivers. The government also influenced these people to “settle” in the lowlands.

Although the Cambodian government has generally been unfavourable towards shifting cultivation, once the Khmer Rouge security threat no longer existed after 1998, many *Brao* and *Kavet* families in all three communes studied began moving back towards their former homes in mountainous areas, where they desired to resume practicing their rotational multi-crop upland rice-based swidden agriculture, using mainly bamboo and secondary semi-evergreen forests.

Review of the Situations in Kok Lak, Santepheap and Taveng Leu

The vast majority of the people in Kok Lak and Santepheap Commune are ethnic *Kavet* and those of Taveng Leu are the closely related *Brao*. Kok Lak and Santepheap Commune elders say that all the *Kavet* originally come from the area around the Lao and Cambodian borders – Kavet, ‘Ntrak and other streams (Fig. 2). Lalay stream was also important. Each village and its inhabitants took the name of the stream they lived beside.

The *Brao* in Taveng mainly lived near the Kampha and Tabok streams (Fig. 2). The *Lun* and *Kreung Dak* have always lived by large rivers in Taveng and Santepheap Commune. *Brao* and *Kavet* people heavily populated large areas of VNP up until the 1960s and 1970s, in dispersed small settlements in several stream valleys (Fig. 2).

Most of the *Brao* and *Kavet* people in Taveng Leu, Kok Lak and Santepheap Communes who originate from areas near or inside VNP would like to be able to live, conduct swidden agriculture,

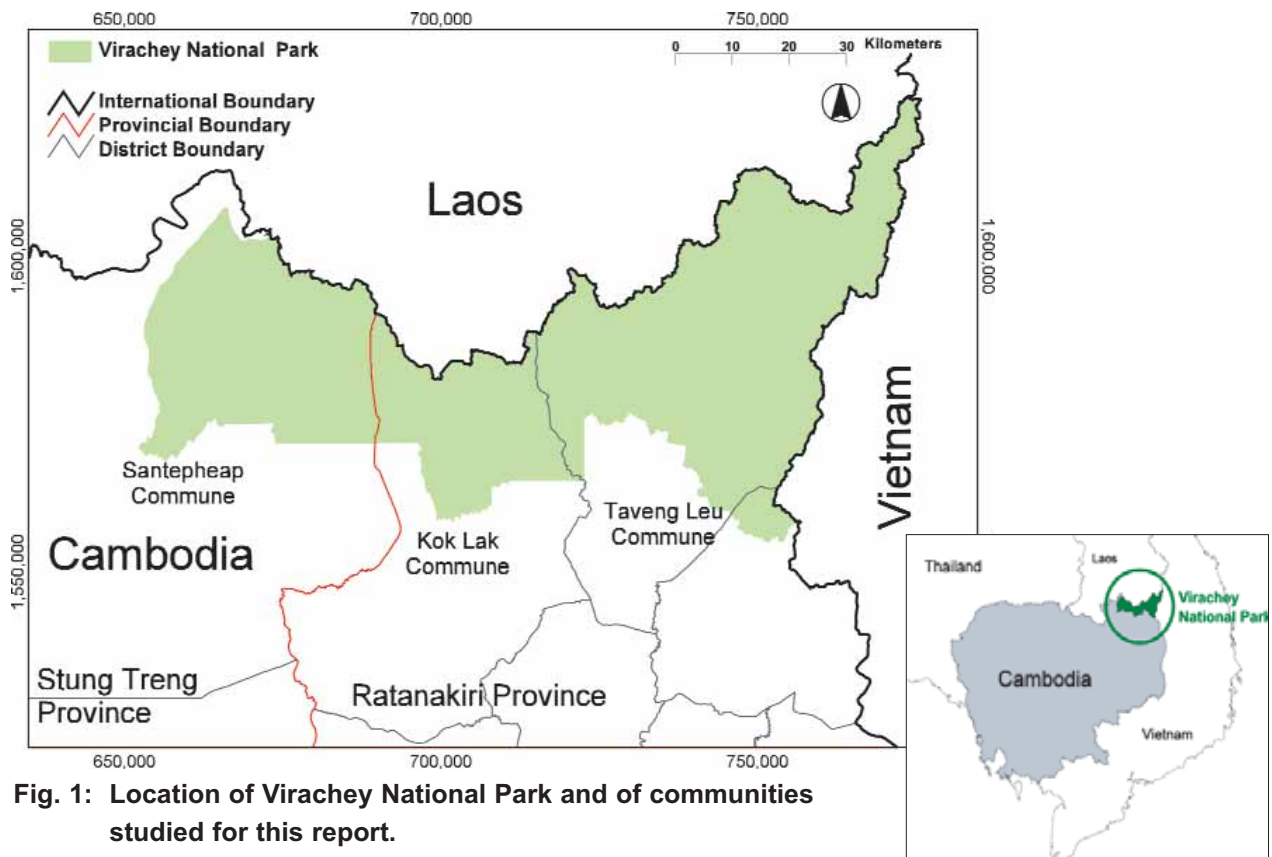


Fig. 1: Location of Virachey National Park and of communities studied for this report.

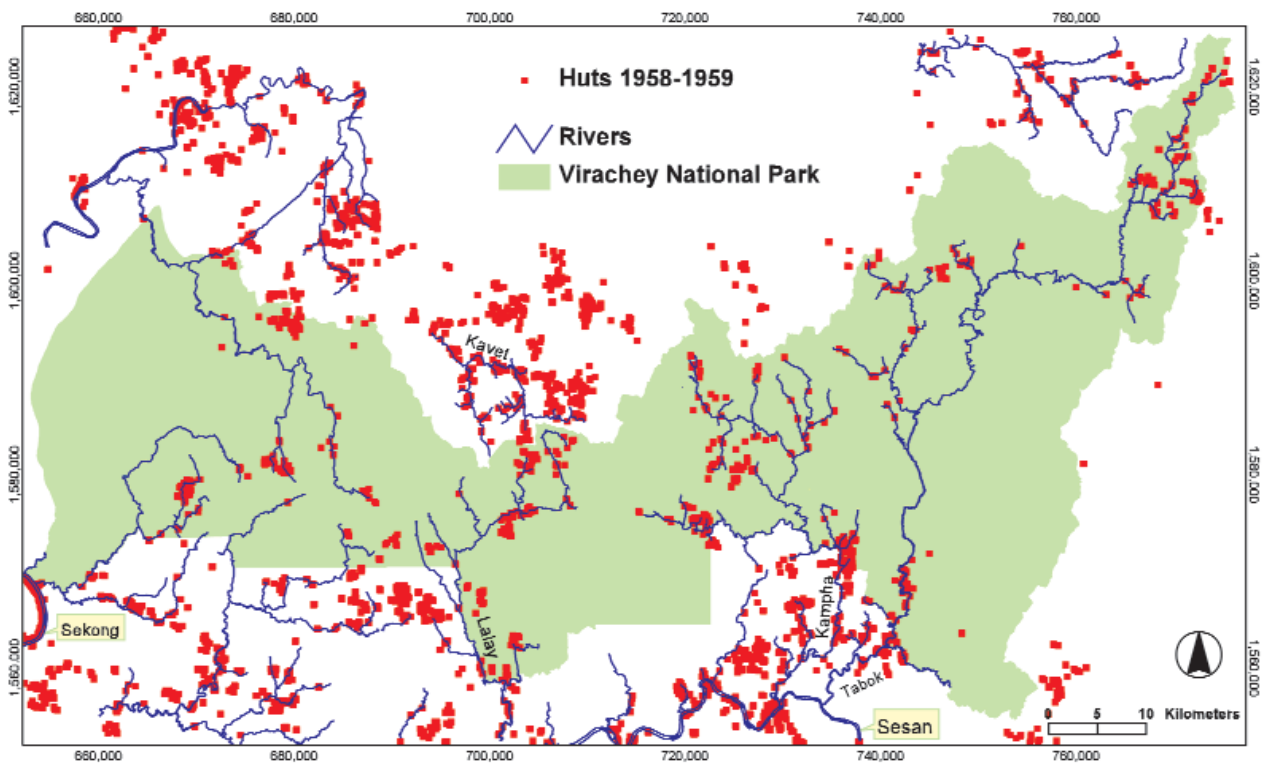


Fig. 2: Distribution of huts in 1958/59 and the location of rivers and streams mentioned in the text. The 'Ntrak is a tributary of the Kavet.

The location of huts was digitised by the GIS unit of the Ministry of Environment in 2001, using 1971 topographic maps which are based on 1958/59 aerial photos.

and collect non timber forest products (NTFPs) inside or near the park boundaries. A smaller number would like to try to adapt to living in the lowlands and conduct wet rice agriculture. Many are interested in mixed systems. Only the *Lun* and *Kreung Dak* people in Taveng and Santepheap are happy to live in the lowlands near the Sekong and Se San Rivers.

There is presently not much of a direct threat from outsiders who have never lived inside the park wanting to move into it. However, increasing numbers of lowland migrants and influxes of workers associated with the Phipeamex logging concession, which shares a common border along most of the southern boundary of the park, could result in increased exploitative hunting, wildlife trading and other activities in and near the park. These newcomers could also impact on the land tenure and natural resource management systems of local indigenous people. *Lao* farmers have been encroaching on the paddy areas of Kok Lak and Santapheap communes, and problems have been encountered with the temporary migration of large numbers of people from south of the Se San, and west of the Sekong Rivers, especially during the malva nut harvesting season in March and April. For long-term sustainable management of Virachey, it is critical that the park reduces the potential impact of these people on the park and on the local indigenous people.

Traditional Land Use Systems and Community Participation in Park Management

There are ongoing misunderstandings about the land use practices of the *Brao* and *Kavet*. Outsiders and Government officials assume that the local people are nomadic, and that their farming systems are environmentally destructive, with low agricultural productivity. Historical evidence contradicts these assumptions, and it is vital for park managers and planners to understand this evidence in order to conduct participatory consultations, negotiations, management planning and zoning with local communities.

Rather than being unorganised and nomadic, the indigenous resource management systems of the *Brao* and *Kavet* are highly organised and closely adapted to the local environment. They have important organisational mechanisms such as traditional *Brao* law.

The *Brao* and *Kavet* agriculture systems consist of short rotation bamboo-based swidden agriculture along the edges of streams and rivers. Generally, people did not cut swiddens far from streams, as doing so made it difficult to access water. A field is only cultivated for one or two years in order to ensure that the soils are not overly depleted, and to allow good fallow regrowth. Forest regrowth is generally very poor if a particular site has been farmed for longer than this. Depending on the area, people would spend 5-10 years moving up one side of a stream, and then they would change sides and start working their way back down, or they would change stream valleys and start working their way down the new valley. When the village centre got too far away from the swidden plots, it would be moved in front of current swidden areas. It took about 10-20 years to return to the same location.

Although mixed bamboo forests appear to be a naturally occurring phenomenon in large areas of VNP, the practice of swidden agriculture has tended to promote bamboo regrowth in fallows. Bamboo regrowth is preferred for swidden agriculture, because soil fertility is restored in 6 years or less and a large amount of ash is produced after burning. Local people therefore have benefited from the “humanised ecosystems” that they have created, which supported established communities in large areas of what is now VNP for several centuries. This long-term management of the forest landscapes of this area means that Virachey is not a pristine wilderness, as most of the park was previously inhabited.

Recent findings in ecology also suggest that moderate disturbance processes in natural areas, provided that they are not too intensive, can promote biodiversity and other ecological functions, and are often necessary to ensure maximum species and community diversity.

The *Brao* and *Kavet* swidden farmers understood and obeyed the main rules of sustainable forest management, such as:

1. Minimise impact and allow sufficient time for forest regeneration by rotating over the landscape and not farming one swidden plot intensively for more than one or two years.

2. Avoid concentrating settlements in one area through dispersed village areas across the landscape and an even distribution of family groups within the village territory.

The 1954 aerial photographs of Kok Lak and Taveng Leu villages clearly show that agricultural activities were concentrated along the Lalay, Kampha and Tabok streams, and that areas away from the stream remained under old growth forests. Satellite images since the 1980s show the progressive deforestation and the expansion of imperata grassland in forested areas in the lowlands outside VNP and north of the Se San River. This has largely been due to the concentration of people in lowland areas on infertile white soils.

One option that is often put forward as the “socio-economic” and “ecological” solution to biodiversity/wildlife conservation in VNP is to encourage lowland rice farming outside of the park. While there is definitely a place for the development of wet-rice paddy farming in most if not all of the communities living near the park, there are several reasons why lowland paddy farming is not the only solution to sustainable biodiversity conservation:

1. The swidden provides several other types of food for family nutrition and income.
2. There is not enough wet-rice lowland paddy land.
3. People can only risk developing new systems of food growing if they can first secure their food supply in some other way while they experiment.
4. There is a fundamental problem with poor soil fertility in many lowland areas.
5. Low lying grassland areas are also used for buffalo grazing by other villages.
6. Several low-lying wetland areas are important as biodiversity conservation zones.
7. Changing from swidden to lowland rice farming could significantly change land distribution and women’s access to land.
8. Changing from swidden to lowland wet rice paddy systems has important cultural implications.
9. Downstream impacts caused by the Yali Falls Dam in Viet Nam make living in the lowlands a risky proposition.
10. Research from Laos shows that forcing people to give up swidden and adopt lowland rice farming has increased rather than decreased poverty and ecological problems.

Mixed swidden and lowland cultivation is possible, but these changes often require an increased workload, for families who may be food insecure, as well as increased risk. Often it will be the most vulnerable members of the community, including women and children who will be the most impacted by such changes. When advocating changing to different farming systems, park management needs to clearly understand the social, cultural, gender and ecological implications of these changes.

The indigenous people of the Virachey area are willing to assist in biodiversity protection, and believe that if they are allowed to live in the park, they can help control illegal hunting and NTFP exploitation by outsiders. Local indigenous people impacted heavily on wildlife during the civil war period, when guns were abundant. The international wildlife trade certainly created strong demand for many species of wildlife, especially since the early 1990s. Presently, however, local people have no guns and pose less of a threat to wildlife.

Conclusions

This report has argued that local people need to participate in joint analysis, develop action plans, and control local decisions, as a requirement for effective partnership. However, people need to be certain of their legal status and have a clear understanding of their rights and responsibilities before they are willing to invest their time. The main lesson from this study is that there is a real opportunity for BPAMP and VNP to support a knowledgeable population willing to participate

actively in the management and protection of the park, if they see that it is in their economic and cultural interest to do so. Park managers should seize this opportunity for the good of the Nation, Virachey, local people, and biodiversity conservation.

This study has shown that VNP represents both a place for conserving biodiversity and a substantial cultural landscape. Because of this, the park represents a unique learning and innovation opportunity. The challenge is to find ways to adapt the local ecological knowledge of the traditional forest managers of this area to the needs of biodiversity conservation, and to develop ecologically, culturally and economically viable livelihoods for local communities. Throughout Cambodia's National Protected Areas System, models of upland management and methods for combining forests with agriculture are needed. Many lessons can be learned from the practices of the former and present inhabitants of VNP, as they have successfully used and managed some of the steepest slopes in the country. This report has argued that the best way to develop a sustainable and cost effective protected area system is through seriously examining how local communities can tangibly benefit from conservation activities, and to focus on what local people already know and do well.

It is important to consider that indigenous people of the Virachey area have also been exploited for as long as history has been recorded. The challenges for developing partnerships and mutual learning with indigenous peoples are literally enormous, as this goes against these historical patterns. Therefore, real commitment will be required to build bridges between the park and local people.

This report has also tried to show that there are clear signs of former villages inside VNP and local people have legitimate traditional rights to occupy parts of the park. For the long-term sustainable management of Virachey, as well as for ethical and moral reasons, the BPAMP should recognise these rights. The indigenous people of VNP should be given the chance to continue their traditional practices in some parts of the park.

Finally, if community-based co-management agreements are not implemented, then conflicts over the control of the area and over who benefits from VNP will very quickly nullify much of the effort and time that has gone into the establishment of the park and the protection of its biodiversity. BPAMP needs to make some bold and perhaps unorthodox decisions in order to continue the process of developing co-management arrangements and decentralising planning and management to diverse local community natural resource management institutions. This is perhaps the most critical learning and innovation frontier that needs to be crossed. This involves changing perceptions of both the role of local people and the role of institutions, such as BPAMP, that implement biodiversity conservation. Perhaps the real wilderness that needs to be explored and conquered is the one that promotes the idea of Virachey as a vast wild frontier, and thus prevents a real understanding and appreciation of the forest based cultures and natural resource management systems of the people of who have long lived there.

Recommendations

Community/Cultural Aspects

1. Training for park staff should be conducted in the following areas: (1) local cultures, their history and language, (2) the potential linkages between biodiversity conservation and indigenous resource management systems, ecological agriculture, forest management and regeneration processes, (3) the role of swidden agriculture and forest collection activities for local livelihoods, (4) the improvement of park staff's 'land literacy' of VNP, and (5) the improvement of communication skills with local people. BPAMP should engage local communities and their chosen representatives to provide the community knowledge aspects of this training to park staff.
2. BPAMP management should assist their staff and encourage them to spend more time in villages, learn from local people, and encourage quality over quantity of work. BPAMP staff should also be encouraged to improve and increase interactions with key elders in the

communities.

3. Local languages should be used and promoted as much as possible.
4. Quotas should be established for hiring local indigenous people as staff of VNP.
5. BPAMP should work with local communities to improve the participation and understanding of women in park activities.
6. A Community Advisory Council should be established, made up of representatives from local communities adjacent to VNP, for consultations about park activities and for developing and implementing co-management agreements.
7. Natural resource management strategies and regulations should be integrated with indigenous legal systems.
8. Innovation and learning about protected area co-management could be explored and enhanced by developing joint interaction and learning activities in the field with local people.

Management Aspects

9. BPAMP should consider hiring a Cultural Advisor to the project to assist with integrating park management processes with local cultures. Such a person could be a local indigenous *Brao* person or should be someone with experience in this kind of work.
10. BPAMP should consider contracting out some of its community consultation work to other organisations and/or assist with the establishment of local institutions to liaise between communities and the project. This could be especially useful for the consultations with communities on their role in implementing the VNP Management Plan.
11. BPAMP should seek closer coordination with the Department of Forestry and Wildlife, the Phipeamex logging concession, and local communities to implement an integrated landscape planning approach that reflects the fact that local communities use areas inside and outside of the park and that biodiversity conservation will only really be successful if it is happening both inside and outside of the Park.
12. A joint programme of monitoring land cover changes and the impacts of land uses such as swidden agriculture should be implemented in cooperation with local communities.
13. Training needs to be provided to BPAMP staff about the World Bank policy guidelines and the protection of indigenous peoples. BPAMP management needs to ensure that these are adhered to.

Livelihood Aspects

14. BPAMP should develop a programme of participatory experimentation, monitoring and training in the development of swidden agriculture, and in sustainable upland management. Such a programme should, as much as possible, be managed by local people and aim to explore ways that the swidden systems of local communities can contribute to biodiversity conservation.
15. Opportunities for enrichment forest planting for income and wildlife could be explored in specific areas of the park by integrating this planting with the rotational cycles of swidden agriculture. Examples of forest species that could be experimented with include: (1) domestically cultivating eaglewood trees in forest areas, (2) increasing the area of malva nut trees, (3) regenerating and developing markets for rattan, (4) understory planting with cardamom, (5) improving the management and marketing of wood resin, (6) enrichment planting with human and animal food species, and (7) developing ecologically and economically sustainable bamboo systems.
16. BPAMP should recognise community rights and allow local communities management rights

to the forest products that have been closely associated to their culture for centuries, e.g. bamboo.

17. Recognition should be given to the agro biodiversity of this region, which is a national treasure. VNP should make efforts to work with local communities to protect this resource through in-situ gene banks.
18. BPAMP needs to ensure that its activities in developing lowland rice growing are ecologically sustainable. They need to investigate hiring expertise in ecological agriculture techniques, either by making partnerships with suitably qualified organisations, or hiring an advisor with experience in this field.
19. BPAMP could directly assist villagers by facilitating discussions with different groups about controlling wandering buffaloes and controlling buffalo theft.
20. BPAMP should investigate market options and provide assistance to local community marketing of – malva nuts, bamboo, cardamom, rattan and other forest products, sesame, etc.
21. BPAMP should allow local communities to manage tourism activities in the park in areas they have traditionally lived in and used.

Future Studies

22. More research in community use issues is required in communes adjacent to Virachey National Park, including Taveng Krom, Koh Piak, Veun Say, Kachon, Koh Pong, Sekong, and Ta Lao Communes, to provide important information for management purposes.
23. Research is required into the implications of large numbers of the population changing from upland to lowland farming systems. A thorough Environmental and Social Impact Assessment is required including: (1) a gender study on the impacts of these changes for women, (2) an assessment with local residents of land use capability, future land requirements, and consequences of permanently settling a significant population in one place, (3) research on the biodiversity conservation values of wetland areas to the south of the Virachey National Park and the potential of these areas to become important wildlife habitat, (4) research on the conflicting land uses by different groups in these lowland areas, and (5) a clear programme of how major social, cultural, gender, environmental and economic impacts and changes will be monitored and mitigated against.
24. A geo-historical map is needed of all the different communities and groups and their territories as a record of the cultural diversity of Virachey and as a way to bridge the past with the future.

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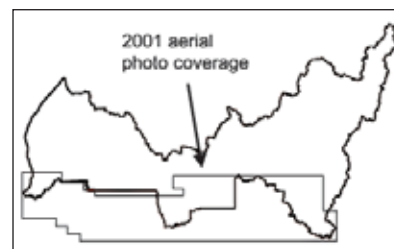
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Maps to Illustrate Changes in Land-use

Ironside and Baird (2003) produced a 1958/59 land-use map, based on the interpretation of 1967 topographic maps. These maps, at a scale of 1:50,000, were produced from aerial photos taken in 1958 and 1959. The topographic maps show forest (dense and clear), plantation, brushwood, bamboo, scattered sugar palm, ricefield, and four mapping units related to wetlands. Areas which do not fall under the above mapping units are left white. These unclassified areas are often associated with villages and include agricultural land and grasslands. Areas of brushwood and white areas on the 1967 maps were mapped by Ironside and Baird (2003) as “former swidden” areas. Two white areas within Virachey National Park were not mapped as swidden because the recent land-use map showed that these areas are edaphic grasslands. The presence of huts outside former swidden areas and the presence of bamboo around huts were used to map the “probable swidden” areas.

The GIS Unit of the Ministry of Environment produced a land-use map of Virachey National Park and areas south of the park in 2003. This map is based on the stereo interpretation of 2001 aerial photos at a scale of 1:25,000. The aerial photos cover the land south of the park boundary and parts inside VNP close to the boundary (see figure on the right). The rest of the park area was mapped using black and white SPOT satellite images with a resolution of 5 metres, taken in December 2002 and January 2003.



Both maps are shown in figure 3. Comparison of the two maps in figure 3 clearly shows migration patterns and changes in land-use between 1958 and 2003.

The map in figure 3A shows the land-use classes “former and probable swidden” within and south of VNP. This map is modified from Ironside and Baird (2003), and excludes swidden areas in Laos and Vietnam.

Figure 3B shows the land-use classes “swidden (active and abandoned) and rice field” from the current land-use map of Virachey National Park (GIS Unit, Ministry of Environment 2003).

The maps in figure 3 show only a few major rivers in order not to distract from the swidden distribution pattern. When comparing figures 3A and 3B it is evident that all settlements from inside and close to the area which is now Virachey National Park were relocated in the 1960s. This led to an expansion of swidden in the lowland areas outside VNP. In the late 1960s about 2.6% of the area of VNP was used for swidden and settlements and about 1.3% for probable swidden.

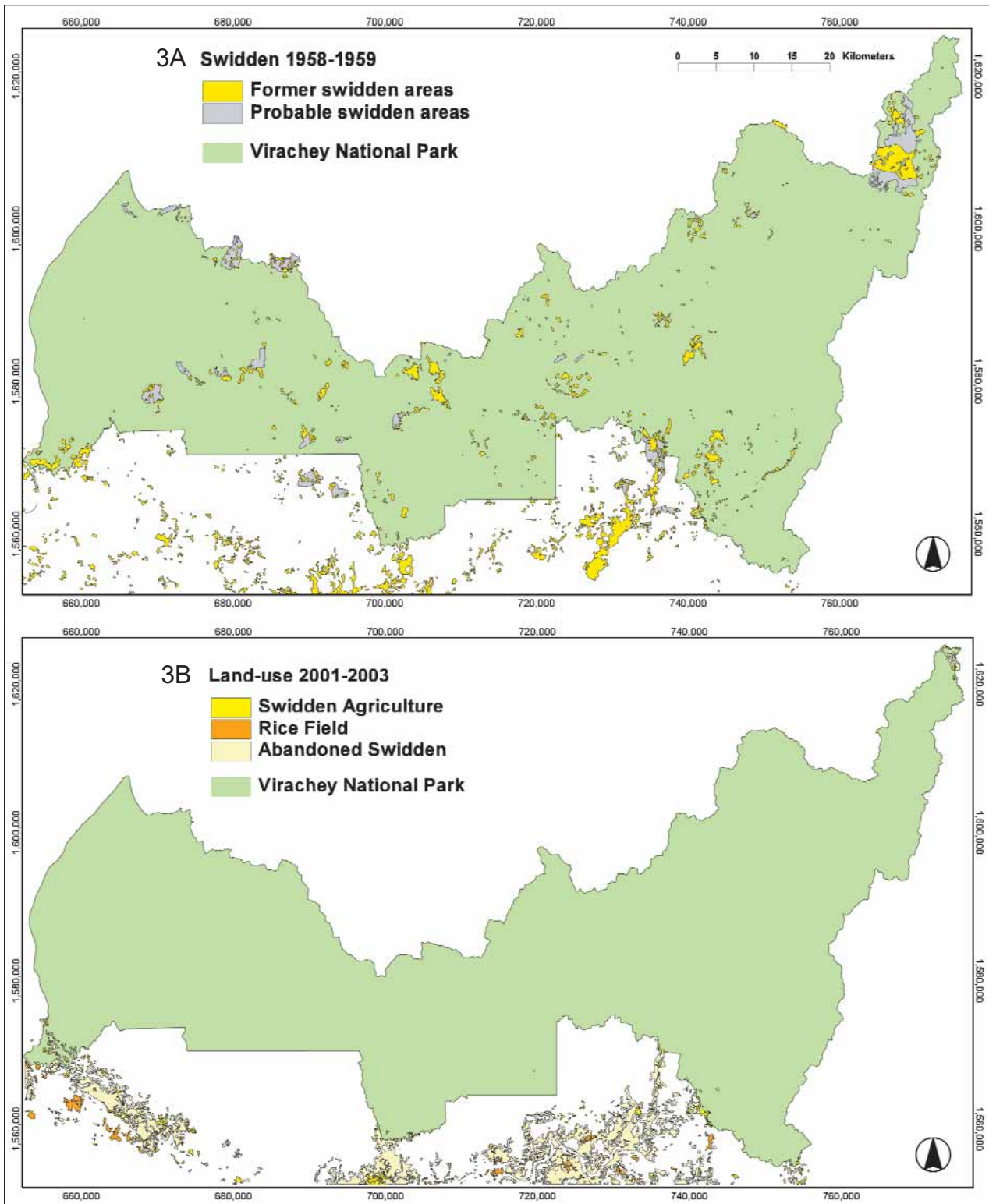


Fig. 3: Changes in the distribution of swidden in and around Virachey National Park between 1958 and 2003.