Initial Assessment of Community Resource Use: A Summary

Introduction

1. General Status

The Kingdom of Cambodia is rich in natural resources. These resources play an important role supporting the livelihoods of local people, particularly in remote rural communities in the northeast provinces of Mondulkiri, Ratanakiri, Stung Treng and Kratie. In these areas forest resources are of significant importance for the indigenous highland ethnic minorities. In addition, these forest resources play a key role in the protection of the environment and watershed and help to protect against natural disasters such as storms, floods and soil erosion. Furthermore, they abound with wildlife and have great potential as sites for forest research and eco-tourism development.

Presently, Cambodia is experiencing considerable forest destruction. There are a number of reasons for the above degradation, such as years of civil war, over-exploitation and misuse of forest resources, population pressure, poor management, low law enforcement and expansion for agro-industry and agriculture, including the customary practice of swidden or shifting cultivation by ethnic minorities in Northeast Cambodia.

As a result, forest cover has changed from 10,859,695 hectares in 1992-93 to 10,638,209 hectares by 1996-97. In real terms, that means 221,486 hectares of forestland have been cleared for different purposes within a three-year period. Moreover, the forest destruction has negatively impacted local livelihoods in rural communities in the country.

Mondulkiri Province is located in the northeast of the Kingdom of Cambodia. It shares its borders with Vietnam to the east and south, Kratie and Stung Treng Provinces of Cambodia to the west and Ratanakiri Province to the north.

Mondulkiri is covered by forest and seated on a plateau with five districts, 21 communes and 96 villages. The five districts are Koh Nhek, Pich Chenda, O Rang, Keo Sema and Sen Monorom. The province covers a total land area of 14,682 square kilometers, with 141,900 ha of dense forest area, 192,000 ha of semi-dense forest area, 913,600 ha of dry deciduous forest area, 99,900 ha of grassland and 101,360 ha of agricultural land.

The total population is 36,300 people with 20% of the total population ethnic Khmer and the other 80%, minorities such as Phnong, Stieng, Ro Oung, Kroll, Jarai, Tumpuan, Thnoun as well as Cham, Lao, Vietnamese and Chinese. Amongst the highland ethnic minorities, the Phnong is the largest group.

All have distinct customs and traditions, culture, language and beliefs. The indigenous ethnic minorities or Khmer Leu rely significantly on the collection of non-timber forest products including bamboo, vines, rattan, resins and wild fruits as well as hunting and fishing. Most of the Khmer Leu communities practice swidden, or shifting cultivation (chamkar).

Additionally, they raise domestic animals such as cattle, water buffalo, pigs, chickens and ducks for their livelihoods. The animal husbandry also helps communities to purchase clothes and necessary household materials and to carry out traditional ceremonies. The provincial town people (mostly Khmer, Lao, Chinese and Vietnamese) make their living by working in government services, operating small-scale businesses and agro-industry (plantation) cultivation.

2. Objectives of the Study
The goal of the assessment was to understand the local setting and how communities use their natural resources. The four villages surveyed are located in Koh Nhek and Pich Chenda Districts near two wildlife sanctuaries. The specific objectives of the study were to:

- Strengthen the research capacity of staff in national and provincial level institutions;
- Document traditional conservation attitudes and practices, inform the communities about national and international perspectives on nature conservation in general and Protected Area (PA) management in particular and assess the perceived development needs and concerns of the communities;
- Promote meaningful communication between PA management and local communities whose culture and livelihoods are most directly bound to the natural resources;
- Liaise and advocate, where necessary, with non-local stakeholders concerning the needs and rights of indigenous villagers, with respect to their land use and related cultural concerns; and
- Disseminate survey findings and map data for use in 1) documentation of customary resource tenure, 2) community natural resource management, 3) land-use conflict resolution, and 4) Protected Areas zoning.

3. Methods of the Assessment

An initial desk study on existing data and information concerning community-based natural resource management and community forestry projects was undertaken. Information was reviewed and studied by the team in Phnom Penh. The following methods were used for the assessment:

- Secondary Data/Desk Study
  Secondary data collection was a way for the team to increase their understanding of the target study areas. Secondary data collection was designed into two phases: 1. pre-field assessment and, 2. post fieldwork. The focus was on building an understanding of the existing information of the target villages. Information included socio-economic data, population numbers, maps, security, communications and if government and/or NGO projects were active. Map reading was also introduced during the desk study.

- Team Building
  It was designed in two steps:

  **Step one:** Team members from different institutions at the national level were invited to join the research team. The objective was to get people together to exchange ideas and experiences on fieldwork, data collection, team work environment and methodologies of field assessment. In addition, team members were briefed about the project and its objectives.

  **Step two:** All research team members at national and provincial levels joined a short training course: on Participatory Conservation and Management of Natural Resources, held in Sen Mororom, Mondulkiri. Concepts of participatory approach, research tools and techniques, CBNRM, resources and people and map reading were introduced and covered during the training course. In addition, data analysis, report writing, Participatory Rural Appraisal and GPS reading were included in the training.

- Site Selection:
  The study areas were selected based on the objectives of the study and a number of meetings and consultation processes with relevant institutions, provincial authorities provincial research members and NGOs. The research team members selected the following four communities:

  1. Sre Thorn Village, Sok San Commune, Koh Nhek District
  2. Royar Village, Royar Commune, Koh Nhek District
  3. Pourapet Village, Krong Tesh Commune, Pich Chenda District

The selection of the above four villages for field work was made according to the following criteria:

- The areas are close to protected areas;
- The areas are still rich in forest resources and biodiversity; Local communities rely significantly on natural resources; and
- The villages are accessible and security is good.

**Data analysis and report writing**

Data analysis was organized at the end of each community assessment to crosscheck data and information. Analysis included the preparation of a presentation to the community for feedback and correction. The community feedback is included in the Final Report. Finally, the team members, including provincial members, spent two more days in Mondulkiri assembling the collected data and information for detailed analysis and classified it into different categories for report writing in Phnom Penh.

Please see Appendix IV (page 111) for Activity Calendar.

**4. Study Team and Activities**

There were 14 team members from different institutions and organizations:

- National level: there were eight members including staff from WWF Cambodia, Office of Community Forestry and Buffer Zone Management, Department of Nature Conservation and Protection, Ministry of Environment, Department of Forestry and Wildlife, and Ministry of Agriculture, Forestry and Fisheries;
- Provincial level: there were four members including staff from the Mondulkiri Department of Environment and the Mondulkiri Office of Forestry; and
- NOMAD (an NGO) (two staff)

Details of the team members are listed in Appendix III (page 112)

**5. Results of the Study**

**5.1. Local Livelihoods**

Pich Chenda and Koh Nhek Districts are respectively located to the northeast and north of Sen Monorom, the provincial town. Pich Chenda District is 44 kilometers and Koh Nhek District 100 kilometers distant from Sen Monorom. Four villages, Royar and Sre Thorn from Koh Nhek District and Pourapet and Busra from Pich Chenda District, were selected as survey sites. In general, Koh Nhek District is a roughly flat land with hot and dry weather whereas Pich Chenda District is hilly land with an unpredictable climate. Village houses are normally narrow and constructed with small, unprocessed timber for supporting columns, bamboo for walls and thatch for the roof. The houses in Sre Thorn, Royar, and Pourapet villages are usually high off the ground whereas those in Busra are built on the ground. Moreover, there are two kinds of houses built in Busra. One is styled like a lowland Khmer house and the second is Phnong styled, which is roofed by thatch down to the ground with walls made of bamboo. The house has only one door and there are no windows.

Phnong is by far the dominant ethnic group in all four villages, particularly in Sre Thorn Village where there are only two Khmer families among 109 Phnong families. In Pourapet Village there are exclusively 60 families of Phnong people. There is a mix of ethnic people in Royar Village, which is composed of 38 Phnong families, 14 Khmer families, and 68 Kroll families. There is also a mix of minority groups in Busra Village, which has 62 Phnong families, three Khmer families and three
Cham families.

<table>
<thead>
<tr>
<th>#</th>
<th>Village</th>
<th>Number of Households</th>
<th>Population</th>
<th>Female</th>
<th>Male</th>
<th>Location of chamkar/pady field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yoyar</td>
<td>120</td>
<td>509</td>
<td>246</td>
<td>263</td>
<td>Along streams, forest areas, marsh areas</td>
</tr>
<tr>
<td>2</td>
<td>Sre Thom</td>
<td>109</td>
<td>518</td>
<td>280</td>
<td>238</td>
<td>Sre Thom, Sre Thas and krauon sub-villages</td>
</tr>
<tr>
<td>3</td>
<td>Busra</td>
<td>68</td>
<td>326</td>
<td>162</td>
<td>164</td>
<td>Along Sre Kleng, O Poul, OChel &amp; Ampok</td>
</tr>
<tr>
<td>4</td>
<td>Pourapet</td>
<td>60</td>
<td>262</td>
<td>165</td>
<td>97</td>
<td>Pourapet, O blay and OTer sub-village</td>
</tr>
</tbody>
</table>

Source: Population statistic records from village chiefs.

In the villages surveyed, the research team found two types of agricultural practices: permanent paddy rice fields and shifting slash and burn (swidden) fields. Because of suitable land along the Chbar River, Royar and Sre Thorn villagers prefer permanent paddy rice fields and small vegetable plots. Except for some small permanent agricultural lands, Busra villagers prefer slash and burn agriculture. This is because of the hilly lands of the village. In all the villages surveyed the people raise domestic animals, fish, collect non-timber forest products and hunt wild animals for their subsistence. Their incomes are mainly earned from agricultural products and resin collection. In particular, Busra villagers earn income from coffee and pepper. The incomes usually are not enough for spices, detergent, medicines, tobacco and other household items.

There are four religions practiced in the survey area: Animism, Buddhism, Islam and Christianity. Most of the Phnong and Kroll people believe in Animism, the Khmer people believe in the Buddha and Muslim people follow the Koran. Some of the indigenous ethnic minorities who have been in Vietnam in the past practice Christianity.

Animism believes in forest spirits and the people carry out sacrificial ceremonies to pray for good rice yields and good fortune. Because lowland Khmer people have immigrated to the northeast (see Royar Village Report), Buddhism has also been followed as much as Animism. As practiced by the villagers there is little conflict between Animism and Buddhism. Moreover, they celebrate a number of religious ceremonies together such as Pchum Ben, Sampeah Preah Khe, Sen Neak Ta and others. However, there is a small conflict between Animism and Christianity (Catholic) in Busra Village. Some Phnong people, who escaped to Vietnam during the Khmer Rouge Regime, adopted Catholicism during their stay. When they returned to Busra they didn't respect the spirit forests (Prey Arak) that the Phnong have revered for hundreds of years.

Among those who have learned to speak the Khmer language only a few can read and write. Of the four villages only Royar Village has a primary school in its own village; the children in the rest of the villages have to go to commune or district schools that are usually far from their village. Besides the village school, the only way children can study is by an informal education. Due to the poverty of the family however, children normally have to do work such as helping with agricultural labor, firewood collection and caring for siblings.

Hygiene, sanitation and lack of primary healthcare services are core problems of the villages. There is no modern doctor serving the villages. Lacking information about disease control, local villagers drink un-boiled water, sleep without mosquito nets and don't use sanitary latrines.

Therefore, malaria, diarrhea, typhoid and fevers often occur in the villages. In order to cure the illnesses, traditional medicines are used and ceremonial offerings (sacrifices) made to the spirits. If the illness persists, villagers may purchase modern medicines from local pharmacies. The medicines
prescribed by these stores may not be appropriate and are often past their expiration date.

There is a healthcare center with staff in two of the villages, Busra and Pourapet. A NGO, NOMAD, helps the village healthcare centers on occasion. Infrequently, provincial and/or district health staff comes to visit Royar village. Koh Nhek District Healthcare Center (approximately 10 kilometres from Royar Village) is responsible for ill people from local villages, especially Royar. Sre Thorn village is particularly disadvantaged, as it has no health education or help from outside but villagers can go to Tourl Village in Sok San Commune, where there is both a traditional doctor and a healthcare center.

Natural water (rain, streams, ponds, lakes, etc.) is a vitally important resource for local villagers. The water is used for everyday life as well as agriculture. There is plenty of water during the rainy season (May -November) and flooding usually occurs along the road from Koh Nhek District town to Royar and Sre Thorn Villages. Conversely, during the dry season people customarily experience a lack of water, especially Sre Thorn Village because it is located far from the OChbar River. Royar Village is more fortunate because the village is located near the OChbar River. Busra and Pourapet villagers use water wheels year round, utilizing the constant source of water from small streams as well as some ponds.

5.2 Land Use and Land Management

Land use and land management is one of the most complicated issues in Cambodia. Land use policy development is very important for the long-term development needs of Cambodia.

The total land surface of Cambodia is classified as follows:

<table>
<thead>
<tr>
<th>Land cover</th>
<th>Area, km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>112,842</td>
</tr>
<tr>
<td>Paddy field</td>
<td>26,097</td>
</tr>
<tr>
<td>Other Flora</td>
<td>25,057</td>
</tr>
<tr>
<td>Upland crops</td>
<td>4,665</td>
</tr>
<tr>
<td>Water surface</td>
<td>4,111</td>
</tr>
<tr>
<td>Shifting cultivation</td>
<td>856</td>
</tr>
<tr>
<td>Large crop plantations</td>
<td>746</td>
</tr>
<tr>
<td>Poor soil land (poor fertility)</td>
<td>336</td>
</tr>
<tr>
<td>Cropland</td>
<td>299</td>
</tr>
<tr>
<td>Dray rice field</td>
<td>293</td>
</tr>
<tr>
<td>Orchard Plantations</td>
<td>188</td>
</tr>
<tr>
<td>Urban areas I</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>175,535</strong></td>
</tr>
</tbody>
</table>

Source: state of the Environment in Cambodia, 1994, MoE

There are similar land classifications among the four surveyed villages. Royar and Sre Thorn villagers divide their lands as rice paddy and vegetable gardens, residential land, cemetery land and forestland. Busra and Pourapet villagers also have swidden agricultural lands. Cemetery and forestlands are public lands and managed by village/commune leaders whereas rice paddy, croplands and house lands are managed privately.

Paddy rice, tobacco, cassava (*dom Jong chhouer*), eggplant, chilies, several kinds of beans, papaya, bananas and vegetable plants are raised in order to support their livelihoods in Royar and Sre Thorn villages. Similar crops are cultivated in Busra and Pourapet Villages, in addition to crops from their swidden plots. Paddy fields are not utilized year round as they lack water. The fields are dry for about six months each year.

Busra villagers also grow coffee and pepper around their village. With the belief that the cultivation of coffee and pepper would continue to be profitable, more and more forest areas have been cleared without thinking of the negative impact to the environment. In general, banana, mango, pumpkin,
chili, garlic, and other legume species are planted around the villager's houses.

With the exception of non-timber forest product collection, cemetery and spirit forests (Prey Arak) are normally intact, because of the fear of bad luck and illness if they are disturbed. However, as mentioned above, some no longer respect the forest spirits and have clear-cut the spirit forests in order to cultivate the land.

5.3 Land Use Rights and Management

In Cambodia the difference between land use rights and land ownership is not clear. The 1992 Land Law of the State of Cambodia stated that all kinds of lands belong to the State. The State has the responsibility to protect and manage the lands. Cambodian people have the right to use and benefit from the land and give their lands to their children. However, the application and implementation of the State law are inconsistent and it is often difficult to precisely know who owns what among public land, privately owned land and traditional land. For instance, the State does not recognize spirit forests (Prey Arak) but local people have traditionally done so for centuries.

In Royar and Sre Thorn Villages each family has been given five (5) hectares of land whereas in Pourapet and Busra Villages 1-2 hectares per family have been granted. Even though the traditional right of land ownership exists and is recognized by the villagers, no certificate is issued nor do local authorities register the land. Ownership is known only by neighboring people.

The ambiguousness regarding land ownership and use in the surveyed villages is because of the lack of financial support law and regulations and human resources to help government agencies to do their jobs.

According to the rules of the local people in Royar and Busra Villages, selling land is not allowed. If this has occurred the ethnic leader may ask the seller to buy his/her land back. Parents may give the land to their children but not sell it. This good tradition of the Phnong minority would make it easier for the government to manage and register ownership of the lands. However, in Sre Thom and Pourapet, villagers may sell their land without permission from the government authority.

Villagers can encroach into the forest area, without penalty or cost. Local villagers can convert forestland into rice paddy whenever they need to by just informing the ethnic leader or commune leader prior to clearing the forest.

5.4 Timber and Non-Timber Forest Use

According to the 1972 classification, forests are classified as follows:

- Mountainous evergreen.
- Tropical watershed
- Mixed dry dipterocarp
- Dry dipterocarp
- Savanna
- Bamboo
- Conifer

According to the local minority, however, forests are classified as follows:

- Cemetery Forests
- Spirit Forests (Prey Arak)
- Second Growth Forests (abandoned chamkars)
- Bamboo or Stream Forest
- Forests surrounding villages
- Primary Forest
• Hilly Forests

In the case of Busra Village they also identified a mineral-lick forest (hunting is banned). In Pourapet Village there is a forest where water seeps from the ground all year long.

Indigenous highland ethnic minorities classify forests by usage whereas foresters classify forests based on its ecology and flora.

<table>
<thead>
<tr>
<th>Type of Forest</th>
<th>Tree Species</th>
<th>Wildlife Species Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest around village</td>
<td>Rattan (<em>Colamus</em> spp.) Wild Jackfruit (<em>Artocarpus</em> sp.) Wild Mango (<em>Mangifera</em> sp.)</td>
<td>Animal species such as squirrel, jungle fowl, mongoose, civet and rabbit</td>
</tr>
<tr>
<td>Bamboo Stream Forest</td>
<td>Choeuteal tuk (<em>Dipterocarpus alatus</em>) Trach (<em>Dipterocarpus intricatus</em>) Chhlik (<em>Terminalia tomentosa</em>)</td>
<td>Wild pig, rabbits, barking deer, snakes, jungle fowl and several other kinds of birds</td>
</tr>
<tr>
<td>Hilly Forest</td>
<td>Phchek (<em>Shorea obtusa</em>) Reang (<em>Shorea siamensis</em>) Trach (<em>Dipterocarpus intricatus</em>) Kholong (<em>Dipterocarpus tuberculatus</em>) Thbeng (<em>Dipterocarpus obtusifolius</em>) Sralao (<em>Lagerstroemia</em> sp.) Chhlik (<em>Terminalia tomentosa</em>) Sokram (<em>Xyli xylocarpa</em>) Thnong (<em>Pterocarpus pedatus</em>) Khnao prey (<em>Artocarpus</em> sp.) Pring (<em>Eugenia</em> sp.)</td>
<td>Barking deer, rabbit, jungle fowl, wild pig, snake, pangolin, lizard, and porcupine</td>
</tr>
</tbody>
</table>

Traditionally, the gathering of timber and non-timber forest products has been only for local subsistence rather than commercial purposes. The timber and non-timber forest products collection is most active during the dry season from December to April when local people are not working in the rice fields.

The following tree species are used in the villages:

• Choeuteal tuk (*Dipterocarpus alatus*)
• Phchek (*Shorea obtusa*)
• Sralao (*Lagerstroemia* sp.)
• Krakas (*Sindora cochinchinensis*)
• Beng (*Afzelia cochinchinensis*)
• Sokram (*Xyli xylocarpa*)
• Thnong (*Pterocarpus pedatus*).

Timber from these trees is used for poles, domestic animal cages, ox carts and plows. Some of the
poles are used as supports for pepper trees as in Busra Village.

Non-timber forest products are also collected:
- Resin
- Bamboo
- Thatch
- Firewood
- Vegetables
- Wild fruit
- Yams
- Honey
- Mushroom
- Medicinal plants

With the exception of resin and honey, NTFP collection is for local subsistence, not for commercial sale.

The collection of resin provides significant economic benefit to the four surveyed villages, especially Sre Thorn Village Choateal tuk (*Oipterocarpus alatus*) and Trach (*Oipterocarpus intricatus*) trees produce resin year round. Men, women, boys and girls all collect resin, according to Busra and Royar villagers. In Pourapet Village, however, it is usually done by a group of people and families whereas men and young boys are responsible for the job in Sre Thorn Village.

Resin quality is normally best during the dry season from November to April. The resin can be sold either in the village (buyers come from district and provincial towns), or in district town itself. The price varies dependent on the quality of the resin.

There are two kinds of resin: *Chor Tek* (liquid resin) and *Chor Chong* (hard resin). 30 liters of best quality liquid resin bring up to 15,000 riels but the price may decrease to as little as 10,000 to 12,000 riels during the wet season.

Hard resin can be sold for as much as 500 riels per kilogram. Both kinds of resin products would normally bring a higher price if villagers did not get in debt with the middleman. Normally villagers borrow money from middlemen during the wet season and use non-timber forest products collected in the dry season for reimbursement.

Rattan and liana (vine) are used as rope for home construction instead of nails, to tie down the roof, to build beds and to affix walls and to make fishing gear. Men and boys go out to collect rattan and liana during the dry season. Royar and Sre Thorn villagers collect rattan and liana from primary (*Prey Khiev*) forests and hill and stream forests whereas Busra villagers get them from the nearby Namlyr Wildlife Sanctuary.

Bamboos are used only to build walls, beds, *Sah* (a basket with straps to be carried on the back) and fishing tools but not to sell. Primarily men collect bamboo in forests near the village and along the streams where it normally grows. Grass (* imperata* sp.) is one of the non-timber forest products, a fast growth species and flammable during the dry season. September to January is a good time to harvest it, which usually done by women. The grass is used as thatch for house roofs. Grasses normally grow in the dipterocarp forest gaps and along the waterways.

Several species of mushrooms like *Kanh Chau*, *Kngork*, *Rngea* and *Rang* are found in the survey areas. In general, mushrooms can be harvested from June to January. Royar villagers find the *Kanh Chau* mushroom have a peak yield in June and July whereas the *Rang* species peaks in November. In Pourapet, villagers say the quantity of *Kanh Chau* mushroom crests in August and September and *Rngea* mushroom is most plentiful from November till January. The mushroom harvest is only for family subsistence, not for commercial purposes.
Besides agricultural crops, wild fruit and yams are important sources of foods. Local people have been eating them for centuries as a reserve food, especially in years of draught and famine. Young bamboo, edible leaves, potatoes, several kinds of yam, young rattan and wild mangoes can be harvested from March to September. Women and teenagers are normally found to be responsible for the above NTFP collection in sites near their villages.

Honey is not only a natural resource for traditional medicine but also a source of local income. Honey can be found in almost all of the forests and freely harvested. Generally, teenagers and adults are responsible for honey collection during March to May. However, Royar and Sre Thorn villagers are unable to harvest honey because their deciduous dry forests are unsuitable for bee survival.

Traditionally, ethnic people know how to treat illnesses by using medicinal plants. The following are some examples of medical plants used:

<table>
<thead>
<tr>
<th>Medicinal Plants</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daem Snoul</td>
<td>Used to cure cough</td>
</tr>
<tr>
<td>Doeurm Lveal</td>
<td>Used to treat injury or stop bleeding</td>
</tr>
<tr>
<td>Doeum Kngea</td>
<td>Its young leaves reduce toothache</td>
</tr>
<tr>
<td>KroKhup Prey</td>
<td>Increases appetite</td>
</tr>
<tr>
<td>Doeurm Kaumyuy</td>
<td>Aphrodisiac</td>
</tr>
<tr>
<td>Doeurm Kam Rvort</td>
<td>Reduce pain</td>
</tr>
<tr>
<td>Vor Tek</td>
<td>Blood thinning and reduce stroke</td>
</tr>
<tr>
<td>Doeurm Pong Morn</td>
<td>Reduce pain during and after birthing</td>
</tr>
<tr>
<td>Doeurm Kinine and Sleng</td>
<td>Treat malaria</td>
</tr>
</tbody>
</table>

However, in recent times the younger generation has not cared to keep their ancestors’ knowledge of traditional medicine. Instead, they are becoming increasingly adapted to the use of imported chemical medicines.

Bush meat is a major source of protein for local communities. Most hunting is for family consumption but sometimes selling or bartering occurs in order to supplement their livelihoods. Hunting is practiced year round by men, occasionally with boys, especially when they are not cultivating crops. Hunting takes place in primary hilly, stream and riparian forests (forests located on the banks of streams and ponds). Traditional tools such as snares and traps are used. As a result of the war, automatic weapons were introduced. Fire is also used to burn the forest for capturing small animals.

As market demand, both national and international, has increased, wildlife collection has become more active. As a result, many species of wildlife are becoming endangered and/or vulnerable. Currently, however, hunting activity is reduced because of stricter law enforcement and firearm collection by local authorities. Poaching is mostly for local subsistence.

Among the surveyed villages, two of them have particular beliefs regarding the killing or eating of certain wildlife. Pourapet villagers do not eat or even kill wild elephants because they believe that killing or eating elephant may lead to the destruction of their village. Wild elephants can be captured only for the purpose of transportation and to cut off small pieces of ivory from the tusks. Sre Thorn villagers believe that eating jungle fowl may cause illnesses.

6. Timber and Non-Timber Forest Use and Management Rights

6.1 Forest Management by Government Authorities

Article No.1 of Forestry Sub-Decree No.35 states that: Timber and non-timber forest resources are State properly and managed by the State.
Article No. 8 states that: Cambodian people, military and police and all levels of government authorities have the duty to take care, protect forests and prevent forest fires, and participate in tree plantation.

Articles 9 and 10 state that: cutting or harvesting timber and non-timber forest products for family subsistence of rural people or for the publics shall be allowed with a permit letter and tax free.

This means that local people have the right and duty to use and manage forests in their community. In fact, the implementation of the sub-Decree among local communities has not taken place and few are aware of such a document. They have been continuing to use and manage their forests as they have for generations. Moreover, the traditional use of forests of ethnic groups seems acceptable within the legal bounds of the above regulation.

6.2 Land Management by Traditional Practices

Under traditional customary management the ethnic minority groups usually do not need permission to utilize the forest resources.

Community Management and Use of Resin Trees

Resin tree owners voluntarily respect each other. They take turns to collect resin. Those people who have no resin trees can work for the resin tree owner and share the benefits accordingly. Signs are marked on the tree or tree location are considered in order to make sure everybody knows tree is already being used. When a resin tree is destroyed, village elders may chastise the violator, if his/her identify is known.

These activities may also help maintain ecological balance and wildlife habitats.

Prey Arak (Spirit Forests) have been revered and protected for generations. Ethnic highland minorities strongly believe that there are deities within the forest and always take care of that forest. It is common for indigenous highland ethnic minority groups to have two or three religious forests. Most importantly, they do not cut trees or hunt animals within the spirit forests for fear of disturbing the spirits.

Therefore, these forests have remained uncut and undisturbed. They are extremely rich in biodiversity.

7.0 Linkage between Local Resource Use and Conservation

Rural people are heavily reliant upon forest resources for their livelihood system. The misuse of natural resources without thinking of the impacts of their destruction can cause major damage to the ecosystem resulting in climate change and biodiversity loss within the country as well as in the region.

In order to prevent the destruction of natural resources and be able to continue their sustainable use, monitoring is needed. Therefore, local participation and management plans must be recognized and considered. Moreover, biological diversity conservation can only be achieved with the involvement of local people. They must be able to derive some benefit from their participation. Participation by local authority involvement is needed when rural people do not clearly understand the purpose of biodiversity and ecosystem conservation. Peoples’ participation and contribution is the right way to achieve the objective of resource conservation. Effective management of endangered or vulnerable species can only be done if the local community is involved.

According to the survey results of the four villages, non-timber forest products, fish and water resources are vitally important to local villagers and should be conserved and managed for long-term use.
Some people say: Slash and burn agriculture sustains natural resource utilization if rotation follows a consistent pattern.

However, others say: Slash and burn agriculture badly impacts the natural resources so that the benefits of slash and burn agriculture must be balanced with the negative impact on biodiversity.

Although slash and burn agriculture has traditionally been an integral part of life for highland ethnic minority groups, the changes in recent times have caused a loss in their identity and way of life.

Natural resource conservation objectives can be achieved if the project is clearly understood and local communities are fully involved with the care and long-term use of those resources.

Animism believes that spirits inhabit the forest, streams and mountains. Ethnic communities have protected the forests where the spirits are believed to stay. Through this belief, biodiversity and ecosystems have been protected. But, population increases, immigration, political unrest and the adoption of other religion practices have reduced belief in the forest spirits. The loss of respect for the spirit forests may negatively impact the ecosystems and biodiversity in the region. Since resin is the main cash income of local people, they carefully protect the resin trees. In general, resin trees are managed privately or by a group. Whether the resin trees belong to villagers or people outside the village, they help each other to protect them. Such willingness can be seen in Busra and Pourapet Villages. This willingness helps contribute to conservation.

Moreover, the belief held by ethnic Phnong about not hunting elephants may also help species conservation. Elephants have become endangered because of outsiders killing the elephants along the Cambodia-Vietnam border and around Namlyre Wildlife Sanctuary Records show that large mammals were once common in this area but now species like Tiger (Panthera tigris), Gaur (Bos gaurus), Banteng (Bos javanicus) and Asian Elephant (Elephas maximus) are considerably endangered or vulnerable.

8. Problems faced within the Community

The following problems are faced within the surveyed villages:

- **Sanitation:** Awareness about sanitation and hygiene is low. No primary healthcare services are available within some of the villages. Illnesses such as malaria, cholera typhoid fever, diarrhea and high fevers are normally encountered because of lack of sanitation.
- **Education:** Pourapet and Sre Thorn Villages do not have a primary school whereas Royar and Busra villages do. However, the schools have no teachers.
- **Communication:** Roads across the districts are extremely poor. Bridges are usually not built across streams or rivers, so transportation is limited during most of the wet season.
- **Food and medicine:** Since rice yields are low, people, especially large families, face a food deficit at least two to three months per year (October-December). Lack of protein and sanitation cause villagers, especially children, to be very thin, weak and sick. Many ill people die because the only way to help them is with traditional medicine, which has limited effectiveness.
- **Forest fire:** Fire is used in order to increase soil fertilizer, to clear walkways and to capture wild animals, but it also destroys the forest.
- **Conflict:** Conflicts are encountered because of the lack of respect some groups (returnees from Vietnam) have for the Spirit Forests. Local authorities, such as village, commune or district leaders, usually mediate the conflicts.

9. Conclusions

The majority of villagers in Mondulkiri Province are ethnic Phnong whose lives depend on traditional agriculture, timber and non-timber forest products, domestic animal raising and fishing. Presently,
resin collection is their main income generation activity because of high market demand.

The roads are in bad condition especially in Royar and Sre Thorn Village areas. During the wet season flooding damages roads. The surveyed villages are isolated from the rest of Cambodia because of lack of communication, public awareness, education and schools. Most villagers do not know how to read. Health programs are not reaching villagers. People do not have awareness of sanitation; potable water and mosquito nets are not readily available, which leads people to experience malaria, diarrhea and fever.

The Animist belief of the Phnong people may contribute to biodiversity conservation because the Spirit Forests (Prey Arak) have traditionally been protected. Ethnic Phnong do not cut down the trees or hunt wild animals within the Spirit Forests, only allowing limited collection of firewood and some NTFPs. Others have been less respectful and have cut down the forests and converted them to rice fields. Slash and bum agriculture is not the main factor destroying the forests, especially if people follow a rotational cycle which leads them back to the original field within 7 -9 years. In fact, the decrease in forest areas can be blamed more to population increases and the conversion of more land for agricultural cultivation.

The traditional use of hunting tools such as snare and trap do not threaten wild animal species when it is only for family subsistence. However, with a rising international market demand and the introduction of modem weaponry wildlife species are now threatened to such an extent that many species are endangered or vulnerable. Strengthened law enforcement and gun collection by local authorities have contributed to the reduction of wildlife trade during the period 2000-2001. Some villagers have been actively involved in helping to conserve wildlife.

The traditional belief prohibiting killing wild elephants contributes to a species-specific conservation. Elephants not only serve as transportation but also give value to tourism.

Immigration of lowland Khmer has influenced local people to change their way of living. There is more emphasis on material goods and the market economy. They have less respect for the forests that in turn has disturbed the ecosystem and environment.

Land certification is not yet available to villagers. Although some activities have taken place, rural people still obey their own traditional rules of land ownership.

The Forestry Law has not been widely circulated by local authorities. The peoples lack of awareness causes confusion about responsibility for and use of local forests between authorities and communities. There has been no effective enforcement of the Forestry Law.

10. Recommendations

In order to help solve some of the problems, concerned government agencies should consider the following recommendations:

- The Ministry of Agriculture, Forestry & Wildlife, and Fisheries should provide agricultural techniques and seeds; including agricultural extension to the local communities and assist in rehabilitating existing irrigation schemes so as to improve and expand rice paddy cultivation;

- Relevant institutions of the government should support local communities to build or repair roads and bridges as much as they can,

- Provincial authorities should set up a non-formal education program, including materials and facilities that will be available for adult villagers. Provincial authorities should also collaborate with NGOs to set up educational programs,
• The Ministry of Health should build health centers with services and facilities in the villages and birth spacing programs should be implemented;

• Provincial authorities should assist each village in digging wells;

• Government agencies should be responsible for natural resource protection and encourage local people to be involved in conservation efforts in order to avoid outsiders from misappropriating them;

• The value of natural resources and the effect of losing them should be made aware to local people as well as to policy makers and others;

• Local people should be involved with management and conservation activities because their participation is integral to achieve success. Training to local communities should be provided;

• Natural resource management policy should include local community involvement and the rights of local family subsistence; and

• Provincial authorities should support and help the technical task force teams