

ROLE AND USE OF COMMON PROPERTY  
RESOURCES (CPRs) IN BHUTAN HIMALAYAS:  
BETWEEN TRADITION AND GLOBALISATION <sup>1</sup>

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<sup>1</sup> Paper presented at The Inaugural Pacific Regional Meeting for Common Property Resources at Brisbane, September 2-4, 2001.

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## **Abstract**

*The objective of this paper is to analyse the present role of common property resources (CPRs) in a resource rich, mountainous environment, and to identify factors that influence their use. This study was based on an analysis of historical trends and 14 CPR case studies all over the country.*

*Bhutan is an exceptional case in South Asia. With its 72% forest cover, rich biodiversity and plentiful water resources, it can be considered as a resource rich environment. As Bhutan was quasi-isolated until the beginning of the 1960's, most land-users were highly dependent on the surrounding natural resources to meet their subsistence needs. This resulted into numerous CPRs all over the country. The most important common property resources in rural Bhutan are: forests, non-wood forest products (NWFP), pastures, water and agro-genetic resources. There were many indigenous agreed arrangements about the management and use of the CPRs, especially in areas where resources were more scarce and where some level of resource competition occurred.*

*During the last decades, the role and efficiency of these local arrangements has declined, due to increased pressure on natural resources, commercialisation of the local subsistence economy, a strong conservation policy and government control over natural resources (by the nationalisation of all non-privately owned land in 1969). In areas where mainstream cash crops became popular, CPRs became less important due to the cash crop focus and substitution of some CPR products. However, in remote and economically less developed areas, CPRs became more important to sustain rural livelihoods due to commoditization of certain common property natural resources. In 2001, the status of the CPRs in Bhutan is mixed. Sustainable use or degradation of CPRs depend on a complex combination of factors. The most important factors are: presence (or absence) of locally agreed arrangements, legal status of the CPRs, method of commercialisation, and government regulation and facilitation.*

*Key words: Common property resources, Bhutan, natural rich environment, commercialisation.*

## 1. BACKGROUND and OBJECTIVE

Bhutan was basically a rural subsistence society till the 1950's. In absence of modern infrastructure, limited trade was conducted via bartering with India and Tibet. Communal property resources (CPR) were widespread and played an important role in sustaining rural livelihoods. The forests surrounding the settlements were used to collect firewood (for cooking and warming), timber and bamboo (for construction material), herbs and medicinal plants (for traditional medicine), forest food (to fill the food gaps), irrigation water (for paddy cultivation), cattle grazing (for dairy products and meat) and many others. The Minister for Agriculture explained the background of this close relationship between rural people and their natural environment in a recent publication (NEC, 1998):

“For centuries, the people of Bhutan have preserved their natural resources and lived in balance with nature. Ensuring the integrity of forests, rivers and soil was vital for the survival in the high valleys of the Eastern Himalayas. The relationship between the Bhutanese people and the environment has been forged over centuries within moral, cultural and ecological boundaries. Respect for these boundaries was ensured historically through a set of formal and informal rules and norms. Traditional and local beliefs promoted the conservation of the environment, and key ecological areas were recognized as the abodes of gods, goddesses, protective deities and mountain, river, forest and underworld spirits. This traditional respect for the natural world ensured that Bhutan emerged into the 20<sup>th</sup> century with an intact natural resource base.”

During the last four decades, an impressive development has taken place in Bhutan. This development was to a large extent stimulated and determined by the following factors:

- Government-initiated development was initiated in the 1960's, and started to have significant impact on rural livelihoods from the 1980's onwards. This development enhanced the access to social services and promoted modern technologies, economic enterprises and trading in rural areas.
- Roads were absent in Bhutan until road construction started in the 1960's. It took about 20 years to build a basic road network throughout the country. Roads dramatically altered access to markets for a significant proportion of the rural community. Cash crops became gradually popular, and partially reduced the dependence of subsistence crops and activities.
- Urban development is a relatively new phenomenon in Bhutan. Until the 1950's, urban areas were non-existent. By the growth of government institutions and the advance of economic development, urban centres started to come up. Consequently, urban demand for agricultural produce started to emerge.
- Globalisation of economic trade hit the Indian sub-continent during the 1990's. This led to more competition for the Indian markets, but also more possibilities for export to international markets.

As a result of increased resource pressure, expansion of the market economy in the rural areas and the nationalisation of the forests in 1969 (which includes most of the CPRs), the subsistence role of the CPRs gradually changed. Under these changing economic circumstances, there are many examples of sustainable use of CPRs, but there are as well many examples of degradation of CPRs. The objective of this paper is to find an answer on the following questions:

1. What is the present role of CPRs in Bhutan?
2. What are the factors that influences sustainable use or degradation of CPRs under the present socio-economic environments of Bhutan?

## 2. METHODOLOGY

The above issues were tackled by studying a wide diversity of CPR cases in order to obtain contrasted situations. In total 14 case studies were conducted (Table 1). The hypothesis was that common principles apply for the different CPRs in Bhutan. The following criteria were used to select the case studies:

- Coverage of different types of natural CPRs.
- Inclusion of sustainable and unsustainable management of CPRs.
- Inclusion of indigenous and government-introduced management of CPRs.
- Inclusion of subsistence and commercial use of CPRs.
- Distribution throughout the country.

For the case studies, existing data and information was used as much as possible. If enough reports were available, then the case study was conducted based on a literature review desk study. If information was not available or not sufficient, then a field study was conducted. Field studies took generally between one day to a week. Informal, rapid, qualitative and participatory methods were used to collect the information. Information was cross-checked by repeated interviews or by comparison with secondary information. The complete case studies will be published as a separate publication by the Ministry of Agriculture of Bhutan and SNV-Bhutan.

## 3. THE CONTEXT OF BHUTAN

### 3.1. *Bhutan: A country rich in natural resources*

Bhutan is a mountainous landlocked country which has to contend with many geo-physical limitations. The landscape is extremely rugged and dissected by powerful rivers, which strongly limits accessibility and development of commercial farming. Forests are the dominant land cover and occupy 72.5% of the total land surface (Table 2) (LUPP, 1997). Consequently, Bhutan harbours an impressive biodiversity of wild species: 165 mammal species, more than 700 types of birds and about 5000 species of plants (RSPN and WWF-Bhutan). These forests are also rich in non-wood forest products, and include numerous medicinal and aromatic plants, wild edible plants and construction materials. Some of valuable species were domesticated for subsistence and commercial use. Bhutan is also rich in water resources. The precipitation varies dramatically in function of the latitude, ranging from about 4000 mm in the South to about 500 mm in the North (LUPP, 1997). Bhutan has four major watersheds, with a large potential for hydropower. As of 1996, less than 2% of the total potential of 20,000 MW has been brought into production (DOP, 1996). The wide range of climatic conditions and topographic features gives rise to many diverse agro-climatic conditions each presenting a different set of problems and opportunities.

The fact that the natural environment is still largely intact can be contributed to the low population pressure on resources and its inaccessibility, but it is also the consequence of a system of beliefs and values. The fusion of Tantric Buddhism and animistic Bonism resulted that the rural people consider nature as a living system, in which people are a part, rather than as a resource base to be exploited for material gain. This has given rise to a complex of institutions, rules, customs and folklore governing the use of natural resources (PCS, 1999).

Table 1: Overview of the conducted CPR case studies in Bhutan.

RESOURCE TYPE	COMMON PROPERTY RESOURCE	USE		MANAGEMENT		SUSTAINABILITY		LOCATION	TYPE OF STUDY	
		Subsistence	Commercial	Local	Government-initiated	Sustainable	Degrading			
Forest	Community forestry	x			x	x	x	Eastern Bhutan	Report review (TFDP, 1999)	
NWFP	<i>Cymbopogon flexuosus</i> (lemon grass)		x	x		x	x	Mongar district	Report review (Legha and Dhungyel, 1996; RNR-RC East, 1998)	
	<i>Tricholoma matsutake</i> (matsutake)		x		x	x		Genekha (Thimphu district)	Literature review (Namgyel, 2000) + field study	
	<i>Pinus roxburghii</i> (Resin tapping of chir pine)		x		x	x		Eastern Bhutan	Report review (Norbu, 2000)	
	Cane and bamboo		x	x	x	x		x	Tama (Zhemgang district)	Field study + report (Phuntsho, 2001)
			x	x	x			x	Wangdi & Punakha districts	Field study
	<i>Cordyceps sinensis</i> (cordyceps)		x	x				x	Lingshi (Thimphu district)	Field study
	Swertia chirata (chirata)		x	x			x		Shingkar Lauri (Samdrup Jongkhar district)	Report review (Pradhan, Moktan and Legha, 1999)
<i>Piper longum</i> (pipla)		x	x	x			x	Mongar and Zhemgang districts	Report review (RNR-RC East, 1999)	
Pasture	Communal pasture	x		x			x	Laya (Gasa district)	Field study + report (JDNP, 2000)	
		x		x			x	Gedu (Chhukha district)	Field study	
Water	Irrigation water	x		x		x	x	Lingmetey chu (Punakha district)	Summary of research findings	
Agriculture	Communal farm	x	x		x		x	Wobthang (Bumtang district)	Field study	
	Plant protection	x	x		x	x	x	Eastern Bhutan	Summary of research findings	

**Table 2:** Land-use statistics of Bhutan (approximates derived from LUPP, 1997).

LAND-USE TYPE	AREA	PERCENTAGE	
		Of total area	Of sub-unit
Forest cover – Total	29,045 km <sup>2</sup>	72.5%	100%
▪ <i>Broadleaf</i>	14,472 km <sup>2</sup>		50%
▪ <i>Conifer</i>	11,315 km <sup>2</sup>		39%
▪ <i>Scrub</i>	3,258 km <sup>2</sup>		11%
Agriculture – Total	3,146 km <sup>2</sup>	7.8%	100%
▪ <i>Dryland</i>	1,405 km <sup>2</sup>		45%
▪ <i>Fallow land (shifting cultivation)</i>	883 km <sup>2</sup>		28%
▪ <i>Wetland</i>	800 km <sup>2</sup>		25%
▪ <i>Horticulture</i> <sup>1</sup>	58 km <sup>2</sup>		2%
Pasture land	1564 km <sup>2</sup>	3.9%	
Settlement	31 km <sup>2</sup>	0.1%	
Rock outcrops, snow, glacier, marshy areas, water spreads, landslips	6,289 km <sup>2</sup>	15.7%	
Total surface of Bhutan	40,077 km <sup>2</sup>	100%	

<sup>1</sup> Area of horticulture is probably underestimated as they were too small to be mapped and/or because they were under forest cover.

### 3.2. The middle path strategy of Bhutan

The central development concept for Bhutan is 'Maximizing Gross National Happiness'. This concept should be seen in terms of a process that seeks to maximize happiness, rather than economic growth. It places the individual at the centre of all development efforts and it recognises that the individual has material, spiritual and emotional needs. Economic growth is not considered as being unimportant, but as a means for achieving higher ends (PCS, 1999). The approach of the Bhutanese government for natural resources management is referred to as 'The middle path'. Bhutan's middle path focuses on the concept of sustainable development, which recognises the need to develop the economy, to progress technically, medically and scientifically, while maintaining the rich cultural heritage, the traditional values and the natural resource base (His Majesty in NEC, 1998). It was with this development approach in mind that the National Assembly decided in 1973 that the country needs to maintain a forest cover of at least 60% for all times to come (RGOB, 1974). This conservation measure was based on the wisdom that protection of the fragile Bhutanese eco-system is essential in order to achieve sustainable development.

### 3.3. Dual development in rural livelihoods

From the development point of view, the present rural environment of Bhutan can roughly be divided into four 'rural zones': remote subsistence-oriented areas, accessible subsistence-oriented areas, accessible cash producing areas, and remote and cash-oriented areas. They all have their specific development constraints and potentials:

1. Remote and subsistence-oriented areas: Villages in these areas are located too far away from roads and markets to allow profitable development of mainstream cash crops. Hence, they are mainly subsistence-oriented. More than half of the Bhutanese population lives on more than a half day's walk from the nearest motor road (PCS, 1999). As most parks are located in remote areas, most of the people living in parks (either in buffer zones, multiple use zones or biological corridors) belong to this rural zone.
2. Accessible and subsistence-oriented areas: Some villages have a good accessibility, but are still mainly subsistence-oriented. Many of these areas have potentials for cash crop development, but they have not yet utilized the potential opportunity.
3. Accessible, cash producing areas: This area has suitable agro-ecological and economical conditions and sufficient resources to develop into successful cash-crop producing areas. Most households of the community successfully utilize the opportunity to develop a livelihood based on this cash-income generating activity.
4. Remote and cash-oriented areas: Although this is rather a rare combination, there are pockets which combine remoteness with cash orientation. For example: some yak herder communities are residing at very remote places, but make a living by trading their dairy products (and sometimes cross-border trading). Considering their small proportion of the population, this zone is not further elaborated in the following analysis.

In the near future, a gradual shift can be anticipated from group 1 to group 2 by expansion of the rural road network, and from group 2 to group 3 by government extension and spontaneous spread of profitable cash crops. It is anticipated that group 4 (remote and cash-oriented areas) will remain quite stable over the years to come. Considering the above described transformations, two dominant development tracks in rural areas are expected to emerge:

#### *Mainstream cash commodity development*

The dominant development model in rural areas is based on the expansion of 'mainstream cash commodities' (i.e. cash crops, cash-generating livestock and/or forestry products). These are products which can be produced in large quantities, as there is a large absorbing capacity in the market. Such a large production needs good market channels and facilities, and therefore most of these cash commodities will be produced in accessible areas (i.e. rural zone 3 and part of rural zone 2). In Bhutan, accessible areas are found in the flat and arable valley bottoms (which are mostly found in western Bhutan and at the Southern belt), and the cash crop producing areas along the main roads. The large variety of micro-climates in the country allows Bhutan to produce some crops on times that Bhutan's neighbours cannot. At present, the major cash crops of Bhutan are potato, apple, oranges, cardamom and chilli. Increased interest of the world market in organically produced products could also provide options for the Bhutanese farmers.

However, the expectation that the complete countryside can be turned into a vegetable and fruit producing area might prove to be unrealistic. Experiences from other mountainous areas, such as Nepal and Northern Thailand indicate that specialised cash crop production is concentrated in certain pocket areas, where suitable agro-ecological and socio-economic conditions coincide. The understanding of the controlling factors for such successful transformations can be useful for future planning. However, transfer of success stories is only possible to areas with similar conditions. In other areas, unsuitable



agro-ecological conditions or high transport costs are likely to inhibit the development of a profitable cash crop-based rural economy. Moreover, competition from other Himalayan horticulture producing areas from third countries is increasing (especially since the recent liberalisation of the Indian market).

*Alternative development in areas not suitable for mainstream development*

Areas, which are inaccessible, and/or lack the suitable production conditions, and/or have limited resources, will not benefit from mainstream development opportunities. They will rather continue to practise a subsistence-based agriculture for quite some time to come. However, there are several problems with this type of agriculture. The subsistence-based agriculture in these areas is mostly based on heavy labour input, and with limited capital and external inputs. Consequently, the productivity of the crop and livestock production systems is considered as low (especially as compared to other countries in the region). In addition, inaccessibility to agricultural inputs and markets acts as a disincentive to invest more in the production system. Finally, in remote areas, the problem of predation by wildlife is widespread and it is one of the major constraints in crop and livestock production (Choden and Namgyel, 1996). As the produces of these marginal agriculture land are often hardly enough for subsistence purposes, people are forced to other alternative sources of subsistence and income to sustain their livelihood. Alternative livelihood sources in these areas need to fulfil the following criteria:

- Niche products: As these disadvantaged areas cannot compete with the mainstream commodity producing areas, there is a need for alternative 'niche products'. They are often very area-specific and often target a small niche market. These diverse and small-scale activities take place in the margin of the national economy, but for local communities they can have a great economic importance.
- Low-volume, high-value and non-perishable products: Commercial products produced in these areas need to be low-volume, high-value and non-perishable. Otherwise, it is very likely that the overhead costs will become too high to make the enterprise economically profitable.
- Limited investment and low risk: Most households living in these areas are involved in subsistence-based farming and are cash-trapped. Alternative income sources, must therefore involve little risk and limited investment.
- Comparative advantages: In order to be feasible and sustainable, economic activities in these areas must make use of the comparative advantages of the remote or inhospitable environment. The comparative advantages of these areas are summarised in Table 3.

The combination of these criteria results in five potential strategies, which are often used in combination by rural households: wage labour, handicrafts, non-wood forest products (NWFPs), livestock products and alternative tourism.

In addition to the local opportunities, these 'economic marginal' areas are likely to gain importance in higher-level functions, which are important and the larger community or society as a whole (see Table 3).

Table 3: Comparative advantages of the remote or inhospitable environments, and their derived potential economic activities.

COMPARATIVE ADVANTAGES	NICHE OPPORTUNITY FOR LOCAL INCOME	HIGHER LEVEL FUNCTIONS FOR SOCIETY AS A WHOLE
1. Abundance of forests Rich bio-diversity	<ul style="list-style-type: none"> <li>- Commercialisation of NWFPs: Dyes, herbal medicines, essential oils, mushrooms, bamboo, cane and others.</li> <li>- Livestock products: Cheese, butter, meat.</li> </ul>	<ul style="list-style-type: none"> <li>- State forestry: Generating national income.</li> <li>- Possible future income from compensation of the international community for world heritage areas &amp; carbon sinks.</li> <li>- Educational functions for school children.</li> <li>- Preserving cultural identity: Bhutanese culture is strongly interwoven with traditional agricultural practices and the natural environment of the country. Maintenance of this environment, with all its local deities and spirits, will be beneficial for sustenance of its cultural identity.</li> </ul>
2. Source of drinking, irrigation and hydropower water		<ul style="list-style-type: none"> <li>- Possible payback mechanisms of downstream water consumers (e.g. hydro-power and irrigation water schemes) to communities who manage their watersheds in a sustainable way.</li> </ul>
3. Cheap labour	<ul style="list-style-type: none"> <li>- Temporary migrate to labour-intensive projects to earn income as a wage labourer.</li> <li>- Remittances from relatives permanently migrated to urban areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Cheap labour available for infrastructural projects in remote areas.</li> </ul>
4. Traditional artistic skills (in combination with cheap labour and local raw materials)	<ul style="list-style-type: none"> <li>- Local handicrafts.</li> </ul>	<ul style="list-style-type: none"> <li>- Strengthen cultural identity.</li> </ul>
5. Nice sceneries Tranquillity	<ul style="list-style-type: none"> <li>- Eco-, agro- and adventure- tourism.</li> </ul>	<ul style="list-style-type: none"> <li>- Recreation area for urban-based people.</li> <li>- Nice living environment for retired people.</li> <li>- Religious centres for retreat and meditation.</li> </ul>

## **4. THE CHANGING ROLE OF CPRs IN BHUTAN**

In the above analysis of rural development in Bhutan (3.3.), CPRs are often crucial resources to support the present and anticipated development processes. Their change in importance and the underlying reasons for these changes are discussed below:

### **4.1. Role of CPR in mainstream cash commodity areas**

#### *Subsistence use*

In urban and accessible areas, population tend to grow rapidly due to immigration for better economic and social opportunities, better education and better health facilities. The initial result is that the need for CPRs for subsistence use increases due to increased demand. However, at certain moment the resource will become scarce or even depleted. The consequent high prices for certain popular CPRs and availability of alternatives, are resulting in substitution of CPRs by fabricated products. Some examples: firewood is being replaced by gas bottles and heating elements, plastic replaces bamboo and rattan products, and mineral fertilizers are used instead of farm yard manure. On the other hand, poorer sections of (semi)-urbanised areas will continue to depend on CPRs for their livelihood.

#### *Commercial use*

Opportunity costs for harvesting CPRs and opportunities for less-dreadful jobs are relatively high in these areas. Consequently, farmers will rather spend their time on a profitable business or on earning a secure wage labour salary, then spending a hard time in the jungle.

As mainstream cash commodity development depends in the first place on private resources and external inputs (e.g. fertilisers), the role of CPRs is limited. Nevertheless, CPRs continue to provide significant inputs for certain economic enterprises. They include: irrigation water (for most horticultural crops), farmyard manure (for potato and apple) and forest cover (for cardamom).

As result of the above processes, utilisation of common pool resources remains stable or decline. As a result, less households are involved in CPR harvesting in Thimphu and Paro Dzongkhags.

### **4.2. Role of CPRs in remote and inhospitable areas (not suitable for mainstream development)**

The role of CPRs in remote and inhospitable areas has increased over the last decades, and is likely to increase further in the future:

#### *Subsistence use*

The subsistence use of CPRs in these areas is stable or gradually increasing, due to a number of reasons:

- Subsistence agriculture is often not sufficient to satisfy the food needs of the household. As the forest resources are in abundance and easily accessible, many farmers go to collect forest foods, such as wild yams, ferns, mushrooms and bamboo shoots.
- In areas with high population concentrations, degradation of common resources for subsistence use is quite common, due to high demand and the de-facto open access status of the CPRs.
- When alternative products for subsistence are hardly available or very expensive, limited substitution is taking place. For example for construction purposes, people depend on forest resources like bamboo, wood and banana leaves, as alternative materials are not available and/or too expensive. On the other hand, some natural products for subsistence use nearly disappeared completely (e.g. tree butter, cotton), as cheap alternatives reached to even the most remotest corners of the country.
- Many of the CPR harvesting are traditional, age-old practices. Use of some of the resources like leaf litter, wild vegetables, medicinal plants and bamboo (for making, baskets, caps, and bamboo mats) are so intimately attached to the local culture, that most of them are continue to be used, even if there is little economic rationale for their use. For example: Bhutanese society, which is strongly bound by traditional social and cultural forces, still places high importance to the traditional medicines and local healers. Even in presence of modern medical facilities, people irrespective of social status make use of the local healers and local medicines prior or during their medication with modern medical procedures. This has lead to continuing dependency medicinal plants locally found in the wilderness.

#### *Commercial use*

The commercial use of CPRs was quite rare before the 1980's. At present, the most important pressure on CPRs in these areas comes from the commoditization of certain valuable CPRs. This rapidly increase can be explained by the following phenomena:

Subsistence agriculture in remote areas generates very limited cash income, while the cash needs of rural people increased due to modernisation, access to education and taste for better products. Collection of valuable CPRs can provide a welcome solution to generate much needed cash. As opportunity costs for labour are low in remote areas, even little profitable CPR collection is better than nothing. Moreover, cash return to labour is quite fast.

As people are not involved in managing the resources, there is no capital investment cost. Therefore, people consider it as a low-risk enterprise and easy source of income, compared to agricultural and livestock production.

- The modernization of Bhutan has brought in the problem of high rural-urban population drift. In some areas, this has directly led to labour shortage for operating crop and livestock production. Consequently, people use this scarce labour resource to harvest common resources from forests, as this can earn them a fast return to labour. Another advantage is the minimum processing requirement prior to marketing for some of the forest products. For example: chirata and pipla only need to be sun-dried before marketing.
- As the demand for medicinal plants and other exclusive natural products are increasing in the world market, high prices are often offered. There is a large demand from international markets for commodities, such as matsutake, lemongrass oil, chirata and pipla. On the other hand, Bhutan is one of the few places where these natural products can be harvested in large quantities (as most surrounding Himalayan areas are much more disturbed or degraded). Consequently, prices are often

very attractive for Bhutanese harvesters. Although the harvesting areas are very remote, their high value make them worth to transport them over long distances to markets, and even Paro international airport. From these points, they are transported all over the world.

- Demand from urban areas can often not be satisfied from its immediate surrounding. Consequently, middlemen often venture around the country to buy certain CPR products from remote areas where it is cheaply available and sell it at cities.

For several remote villages, sale of valuable NWFPs is at present the most important way or even the only way to earn cash income. This is reflected by the high dependency on forests products in Samdrup Jongkhar, Chukkha Zhemgang, Trashigang and Samtse (Table 4). Many forest products, which were before not-harvested and unknown, and are now eagerly looked after: e.g. matsutake mushroom, medicinal plants (pipla, chirata), and aromatic plants (lemon grass, chir pine). Other CPRs which were traditionally harvested for subsistence use are now increasingly used to generate cash income (e.g. grazing of communal pastures and forests for dairy products). The CPRs in remote areas which are facing increased pressure include: forests (for grazing), communal pastures (for grazing), valuable NWFPs (for sale and handicrafts) and beautiful landscapes (for alternative types of tourism). For the future it is anticipated that the competition for different uses of water will increase. Sometimes, the pressure can be indirect. For example, it has been observed in Eastern Bhutan that the frequency of fire has increased since lemon grass extraction has become a profit citral acid. able enterprise. This is because it is believed that the burning of lemon grass increases the yield of distilled.

**Table 4:** Percentage of farm households dependent on forest resources and non-forest products (Derived from RNR-census, 2001).

CPR	Household involvement (%HH)		
	National average	Highest %HH / District	District
Firewood	90.7	98.2	Pemagatshel
Bamboo	42.2	61.4	Chukkha
Fodder	41.5	88.1	Chukkha
Fern tops	37.8	55.1	Zhemgang
Wild mushroom	20.7	49.3	S/Jongkhar
Cane shoot	4.2	15.1	Zhemgang
Edible oilseed	4.1	21	Punakha
Lemon grass oil	0.8	5	Lhuentse
Dyes	0.7	1.8	Pemagatshel
Pipla	0.4	8.7	Zhemgang
Resin	0.3	1.6	Mongar
Chirata	0.3	3.7	S/Jongkhar

## **5. FACTORS INFLUENCING SUSTAINABLE USE OR DEGRADATION OF CPRS**

The 14 CPR case studies conducted for this study were analysed to identify factors influencing sustainable use or degradation of CPRs. The analysis showed that the majority of the CPRs were degrading, although degradation of CPRs is localized and still reversible in most cases. On the other hand, there were also a few success stories. However, the reasons for either sustainable or degrading use showed to be quite complex.

### ***5.1. Factors related to local management practices***

The most common reasons mentioned for degradation of the CPR resource base were over-harvesting, increased number of harvesters, harvesting of immature products and careless harvesting. But these are just symptoms. Over-harvesting and improper harvesting are often the result of a lack or decline of community rules. This can be caused by absence of user rights, unequal traditional user rights, weak community spirit, individualism, and the perception that CPRs are a 'free resource'. This results in unclear boundaries, lack of management and harvesting rules, and in some cases poaching and community conflicts (e.g. irrigation water management, pipla). In one case, it was mentioned that the younger generation is less aware and less concerned about sustainable harvesting (e.g. cane and bamboo in Tama). In absence of communal accepted arrangements, the only rule is 'First come, first serve'.

On the other hand, communities who harvest CPRs in a sustainable way have local accepted community rules, a system of community monitoring, accepted leadership or committees, and a way to control outsiders or 'free riders' from harvesting. A list of commonly used rules in Bhutan is shown in Table 5. The most efficient rules are the one that can be easily monitored. For example: declaration of starting and closing dates is used to control harvesting of several NWFP, as it is easy to monitor by the community members. Rules based on harvested quantity or quality are more difficult to monitor. There are some rules, which are typically used by communities, while some rules are only by government agencies.

Table 5: Overview of rules and arrangements for the management of CPRs in Bhutan, with examples of the CB-NRM case studies.

RULES	LOCAL MANAGEMENT	GOVERNMENT-INITIATED MANAGEMENT
1. Rotation system	Bamboo (Sephu), irrigation water (Lingmetey chu), between private and comon tsamdrog (Gedu, Laya).	-
2. Distribution system	Irrigation water.	-
3. Communal use of portion of income/fine	Religious ceremony (or <i>rimdo</i> ) for the well being of the community (e.g. chirata, matsutake).	-
4. Share private resources	Communal using private tsamdrog (Laya).	
5. Communal renting from absentee landlord	Communal pasture (Radi).	
6. Flexibility if conditions change (e.g. scarcity, higher demand)	Water rights changing in function of labour contribution (although most traditional water sharing rules are not changing).	-
7. Fixed opening and closing date for harvesting	Decided by committee or local forest regulator (or <i>lepja</i> ) (e.g. chirata).	Decided by agencies + endorsement by village leaders ( <i>tsokpa</i> 's) (e.g. matsutake).
8. Boundary	Cane & bamboo before 1969 (Wangdi and Punakha).	Matsutake, community forestry.
9. Monitoring	Local forest regulator (or <i>lepja</i> ).	Forest guards.
10. Fining system	Payment is made to the village elders or committee.	Payment to government agency.
11. Accountability of users	Accountable to fellow villagers.	Accountable to agencies.
12. Equal rights for every member	Chirata harvesting.	Tang farm.
13. Strong leadership / committee	Local leaders.	Manager and community board of directors e.g. community farm at Wobtang); collector committees ( <i>tshokpa</i> ) (e.g. matsutake).
14. Control of outsider free-riders	Matsuatake (Geynekha).	Possible, if official accepted management plan (e.g. community forestry).
15. Expert advice	-	Matsutake, community forestry.
16. Identity card and registration for trained harvesters	-	Matsutake.
17. Minimum size of product	-	Matsutake.
18. Training	-	Sustainable harvesting techniques , ecological rules and quality control, post-harvest (e.g. matsutake).
19. Legal rules and regulations	-	Social forestry rules.
20. Permit system	-	Social forestry rules.
21. Subsidy from agencies	-	Wobtang farm, irrigation, community forestry.
22. Free labour contributions	-	Wobtang farm.
23. Compulsory membership	-	Wobtang farm.

The use of CPRs by neighbouring villagers is often well arranged. Four different situations were observed:

1. Neighbouring villagers are allowed in exchange of use of their CPRs (e.g. communal pasture of Laya).
2. Neighbouring villagers need to pay a fee for using CPRs (e.g. Gedu pasture).
3. Neighbouring villagers are chased away and their harvest is confiscated or they are fined (e.g. matsutake at Genekha).
4. There is no arrangement, and outsiders freely encroach in other areas.

When the use of resources by neighbouring villagers are regulated (first 3 cases), then little damage on the resource base is expected. Only the free access (case 4) is potentially damaging.

## **5.2. Communal versus private user rights**

Communal user rights were found to co-exist with private user rights in three CPR case studies (i.e. pasture at Laya and Gedu, and pipla harvesting areas). In each case, the private resources were better managed than the communal ones. Assuming that commercialisation of the rural economy will stimulate private initiative rather than communal initiatives, one can wonder whether private management of CPRs is the trend in the future? At least two pre-conditions can be identified for private management of CPRs: it should be easy to demarcate and recognise boundaries, and there should be no management issues which can only be dealt with at the community level.

However, the conclusion will not be straightforward. For example: the unequal distribution of private pasture at Laya forces the households who lack private pastures to use the communal pasture, which is now used above its carrying capacity. As such, the grazing pressure is transferred from the private resources and concentrated on the communal resources. On the other hand, some private pasture owners joined hands by rotating their yaks in their adjoining private pasture. This hybrid private-communal system seems to result in a sustainable management of the pasture land.

Although the sample was small, it highlights the need to think about conditions when private management is better than communal management, and vice versa. More research is needed on this topic under Bhutanese conditions.

## **5.3. Effects of CPR commercialisation**

Commercialisation of natural resources is often associated with degradation of the resource base via the following process: Increased market demand of a product leads to increased prices. This price incentive results in increased harvesting and more harvesters. This finally results in scarcity and degradation of the resource base.

However, the picture is more complicated in reality. For example, the role of outsiders can be crucial. 'Outsiders' are defined as people from outside the local community: they could either be middlemen, contractors, urban people of government agencies. When CPRs are commercialised, the role of outsiders becomes more prominent. Outsiders can extract CPR products directly by using hired labourers or work via the local villagers:



### *Direct harvesting by outsiders*

The first system seems to be the most detrimental. Commercial harvesting is controlled by permits, which are provided by the territorial forestry. The permits specify the area and the allowed amount, but the system provides little guarantee for the environmental friendliness of the harvesting method, as this is not specified, nor monitored. As outsiders collect their product mostly by vehicle, accessible areas will endure the largest harvesting pressure. Once outsiders have obtained a permit, they are entitled to go straight to the harvesting area. They do not communicate with the local villagers and ignore the traditional user rights and methods. Most outsiders do not care about the impact of their harvesting method, as they can easily go to another area. The way of payment to the hired labourers influences the harvesting style. When the labourers are paid based on the harvested volume, then there is a tendency for random harvesting, including immature products. When they are paid per day, then easiness of harvesting will determine the harvesting style. Some villagers also complained that outsiders bring in labourers who are unskilled in harvesting the CPR products (e.g. cane and bamboo at Tama).

### *Middlemen making use of local villagers for harvesting*

System of middlemen is very common in the market chain of commercial NWFPs. The long distance from the village to the market, the small quantities collected per household, the mobility constraint, are some of the important reasons mentioned by pipla collectors for not bringing their produce personally to the market. Villagers sell their produce directly at the market only if they live nearby to the market.

In some cases, contractual agreements are made between outsiders and collectors (e.g. matsutake). There are potential benefits to contractual agreement (Belcher, 1998):

- Contracts, whether formal or informal, are one means of ensuring a better match of flow of materials between farmers and commodity buyers.
- Farmers forfeit independence in their production and marketing decisions, in return for security in terms of market access, security of prices and technical and logistical assistance.

However, farmers are often in a weaker position and it was often mentioned the harvesters do not get a fair deal. Conditions might be very attractive in initial stages and when prices are high. In case of matsutake, for some time middlemen were even competing for collectors. Once prices drop, earlier agreements are easily ignored by the middlemen. As collectors have little alternative, they need to sell their products at cheap prices. In addition, the phenomenon of price fixing by outsiders was often mentioned. As the number of middlemen are often limited, it is easy to agree a price among themselves. As the collectors are often very numerous, it is more difficult to fix a bottom price. This can lead to conflicts in the harvesting community, as the poorer households more easily agree with a lower price, while the richer ones would prefer a boycott of the sale. Moreover, due to remoteness of most the harvesting areas, the marketing is not transparent, and it is easy for the middlemen to keep the market prices secret.

What about the effect of the middlemen on the sustainability of the resource base? The number of CPR products which can be commercialised has definitely increased due to globalisation. When a good price is offered, and there are no defined user rights, communal agreements and defined boundaries, then there is a high likelihood of degradation of the resource base. Commercialisation of a CPR product can also lead to a decline of a local use arrangement, which originated from times that the resource was used in a subsistence way. Consequently, over-harvesting, maximization of the harvesting period and

harvesting of immature products result into degradation of the CPR base. Examples of this degradation process were observed with pipla, lemon grass, bamboo and cane.

On the other hand, the prospect of handsome profits can be an important incentive for the community to come together and to protect their resource base against over-harvesting and extraction by outsiders. When an accepted system of rules is formulated and respected, and the ecological relationships are well understood, then commercial harvesting can lead to sustainable management. However, for this to happen there is often a need for government assistance (e.g. matsutake) or for a strong community leadership (e.g. chirata) to frame and implement the rules. Finally, the quality control and grading of the collected products by middlemen provides protection against harvesting of immature or undersized products.

#### **5.4. Impact of government regulations & initiatives**

##### *Legal status of CPRs*

Since 1969, all non-private owned land was nationalised and declared 'Government Reserved Forest'. This measure enabled Bhutan to avoid massive deforestation, and successfully limited uncontrolled logging and timber export. In addition, it adopted a policy of sustainable timber harvesting by means of Forest Management Units (FMU's). From the conservation point of view, these measures can be hailed as a success, as Bhutan still have a forest cover of 72%. However, this measure had also side-effects on the way local villagers perceive and manage the natural resources around them. Before 1969, many communities had their locally defined harvesting areas for subsistence products, such as firewood, bamboo, cane and others. They often had a kind of local forest watchers to watch that nobody made misuse of the resources. Nationalization made these locally defined harvesting areas irrelevant, as outsiders from all over the country could harvest anywhere in the country as long they have official permits. With the advance of the road network, outsiders were able to tap more resources due to the open permit system. The task of local forest watchers also became redundant, as government forest guards took over the responsibility to monitor the use of the forests.

Despite, this change in status of the CPRs, rural people continued to use CPRs, although in different ways. Farmers maintained a certain degree of access (based on traditional rights and/or permits), but lost the control and responsibility to manage the resources. However, when government capacity to monitor the use of natural resources is limited, and when local agreed arrangements are lacking or are dysfunctional, a de-facto 'open access' situation is created. Under these conditions, each of the households has an incentive to extract more resources. This incentive is created by the fact that the marginal additional value is garnered by the individual household, while the marginal additional cost is borne by the whole community. As a result, the negative cost is only a friction of the marginal added value the individual households stands to gain. The end-result is over-exploitation of the commons, perhaps to the point at which further use is unsustainable. This phenomenon is popularly called 'the tragedy of the commons' (Hardin, 1968). Several of these 'tragedies' have already taken place in Bhutan, although on local scale. Once the government land is degraded, farmers feel no slightest responsibility or interest to restore the natural condition and adopt a wait-and-see attitude until the government take initiatives for rehabilitation (e.g. Tama, Koma, Radi).

### *Rules and regulations regarding CPR use*

Several acts and rules were established to regulate natural resources management in Bhutan. The land tenure system in Bhutan is governed by the 'Land Act' of 1979 (RGOB, 1991), which is aimed at achieving food security, obtaining equitable distribution of land, and making the best use of limited resources (PPD, 1999). Finally, the 'Forest and Nature Conservation Act' (RGOB, 1995) and its rules (MoA, 2000) provide a legal framework to protect and to sustainably use forests, wildlife and related natural resources of Bhutan for the benefit of present and future generations. For some valuable species (e.g. matsutake, chir pine) guidelines are provided based on scientific research (e.g. minimum size, harvesting method, fixed harvesting dates), and fines are formulated for offenders. These rules are very useful and have certainly had a positive influence on maintaining Bhutan's rich natural resources. But again, there are some side-effects on the status of CPRs. A few examples:

- Pasture land (*tsamdrog*) has dubious rules for ownership. Although a farmer who owns a registered pasture is entitled to graze it, the land is still considered government reserved forest from the legal point of view.
- A ban of forest fire is unarguably beneficial to reduce the frequency of wild fires. However, also controlled fires for management purposes are banned. For certain natural resources fire is considered as a management measure to maintain the quality of the resource base. As such, a ban of fire has resulted in a decline of quality of pasture land and lemon grass. At present, the ban is being reviewed.
- A ban of shifting cultivation (*tseri*) resulted in a decline of the practise. However, some medical plants such as chirata thrive on these fallow lands. As a result the population of chirata has declined over the past decade.
- Collection of certain species is made illegal in order to protect them fully. However, making harvesting of very valuable species illegal without proper monitoring leads to poaching (e.g. *cordyceps*). When poaching for commercial purposes is taking place, all sustainability issues will be disregarded.
- One exception where the local management systems are given due respect is for water management. This is because there exist no legal framework for irrigation water management. When a dispute arrives, the status quo principle will be maintained by the court. However, this status-quo is often based on past power balances, which were most of the time in favour of the (past) richer households. As such, legal decisions are maintaining unequal and often inefficient ways of water-use (e.g. Lingmetey chu).

### *Government facilitation of CPR use*

The case of matsutake mushroom is a nice example how government agencies can regulate a trade of CPR products in a sustainable way. The national mushroom centre (NMC) is providing training for the local mushroom collectors on sustainable harvesting techniques and protection of the collection zone of matsutake. With collaboration of the Forestry Department, all the trained mushroom collectors will receive an identity card and will be registered as matsutake collectors. The list with their names will be kept with the local matsutake agent in each collection area. This gives a semi-legal framework for qualified harvesters to collect matsutake from the natural forest and to sell to local agents. The NMC in cooperation with DOFS control the commercial harvesting by declaring the opening and closing dates of the matsutake season, so that the stock of matsutake in the forest receive adequate time to spread

spores for future regeneration. The collectors are not allowed to harvest the matsutake less than 6 cm in length, because the harvesting of smaller ones size causes greater disturbance of the soil and to the mycelium zone. The local forest officer in each area controls the functioning of the local management system, and the amount of matsutake harvested and sold is recorded.

Similar approaches are tried out in national parks under the Integrated Conservation Development Programs (ICDP). An example is the community of Tama, where a plan and boundaries for sustainable management and harvesting of cane and bamboo are agreed upon, in return for exclusivity rights for the community.

Some important lessons can be learned from past government initiated CPR management:

- It takes a long time before obtaining visible results (e.g. 12 years for matsutake at Geynekha, it would take an estimated 5-6 years for a repeated exercise at another location).
- Strong leadership and/or government facilitation is essential, especially during the first few years.
- Social aspects & community mobilisation take about 80% of the time, and are much more challenging than the technical issues.
- User groups should not be too large. Ideal size of a user group is between 10 and 30 households.
- Instant benefit, in one way or other, is necessary to keep members interested.
- Compulsory membership to user associations (e.g. Wobthang farm) is not very productive and results in unmotivated members.

### **5.5. Ecological factors**

The level of pressure and resource scarcity can influence the way of management in both ways. If the CPR is in abundance, inefficient and uneconomic use of CPRs takes place, while labour and capital are economized. Scarcity can be a good incentive for cooperation among the community. However, when the pressure is extremely high, households find it irrelevant to agree upon sustainable management practices. Consequently, households use the resource base by hit-and-run, with degradation of the CPR as the unavoidable result (e.g. communal pasture at Laya).

In general, local users have a pragmatic understanding of the ecology of the product they harvest. It was observed by collectors that over-harvesting of one species could lead to invasion of foreign or unwanted species (e.g. effect of over-harvesting and burning in lemon grass areas on invasion of other weeds, effect of cattle grazing on regeneration of bamboo and forest species, effect of reduction of predators on the increased agricultural damage by wildlife). However, in case of more complex ecological relationships (e.g. forest cover - water yield, mycelium - matsutake, pruning - cane yield), the lack of awareness can be a constraint for sustainable management. In that case, government agencies can provide an important contribution to sustainable management by means of awareness campaigns.

## 6. CONCLUSIONS

Until the 1950's, Bhutan had no road network and was isolated from the rest of the world. Consequently, most households were self-sufficient and practised a subsistence type of agriculture. As the natural resource base has always been very rich, rural livelihoods depended heavily on community property resources (CPR) to make a living. Since the 1960's, Bhutan has developed rapidly and gradually started to participate in the world economy. The role of CPRs has been changed over time, but the type of change is strongly dependent on the economic situation:

1. In accessible areas, where mainstream cash crops became a profitable business, the role of CPR products remained stable or declined. On one hand, the demand for some CPRs increased in order to support the fast growing population (e.g. firewood) and to enable the growth of the cash crop production (e.g. irrigation water, manure). On the other hand, a lot of natural products are substituted with cheap and easy available alternatives (e.g. CGI sheets and plastic instead of bamboo and cane products). In addition, as opportunity costs are high in these accessible areas, farmers will think twice before venturing in the forests to collect some forest produce.
2. In remote, inhospitable or unsuitable areas (where mainstream crops cannot be produced), the role of CPRs has increased. On one hand, the productivity of subsistence agriculture is low and does not provide sufficient products and cash income to fulfil the household needs in modern times. On the other hand, the mostly poor farmers are living in an environment rich in natural resources. Natural products which before had no or limited value, became suddenly potential valuable sources of income due to internationalisation of the markets. As there are little other cash opportunities in these areas, it is easy to understand that farmers are attracted to collect valuable CPR products for handsome profits. Such activities involve no investment, limited labour and little risk, while cash returns to labour is very fast. In addition, the CPRs for subsistence use are continued to be used as population increases and substitution is limited.

From the above, it can be concluded that CPRs still play an important role in present rural Bhutan. There is a wide range of local and government-initiated management systems, and both of them can be either sustainable or unsustainable. It cannot be concluded that local systems are better than the government systems, or vice versa. However, the CPR case studies provide us indications about the forces that drive sustainable use or result in degradation of the resources base of CPRs:

1. On the local level, local agreed harvesting rules and leadership to implement the rules are essential for sustainable use of CPRs. Many traditional systems disappeared, but the ones that are still in place (or that are still remembered) can be a suitable source of inspiration. The difficulty to control outsiders and 'free riders' was often mentioned as a constraint for sustainable management.
2. Under certain conditions, private management of CPRs might be better option. Pre-conditions for private management include: easy recognisable boundaries and absence of off-site effects.
3. Commercialisation of CPRs can have diverse effects on the sustainability of the CPRs. There are basically two systems. Direct harvesting of CPR products by outsiders does definitely no good, as there is a complete lack of accountability. An alternative system is that local villagers harvest CPR products and sell them to middlemen. Although this system provides potentially more bargaining

power to the villagers, they are still in a weaker position compared to the middlemen due to absence of transparency of the market. If prices are good and there are no rules of the game for both middlemen and collectors, then the resource base is doomed to degrade. However, if there are ecological and economic sensible rules for both players, then the system can benefit both partners and can lead to sustainable management of the resource base. However, for this system to work, there is a need for strong local leadership and/or efficient government facilitation.

4. The Royal Government of Bhutan has taken a very strong stance on conserving their rich natural resources base, and were very successful in doing so. However, some of the conservation measures had negative side-effects on the quality of some CPRs. The most prominent example is the nationalisation of all non-private land into 'Government reserved forest'. This took away the control and responsibility away from the local communities. As monitoring was limited (especially for non-timber resources), open access was created, which led to 'tragedy of the commons'.

On the other hand, during the last 5 years, several government initiatives had sprung up to facilitate CPR management and commercialisation in close cooperation with local communities. A few success stories are emerging. Moreover, new legislation to encourage community participation in common resources management is coming up.

As the management of CPRs often involves many stakeholders, it not easy to reach a consensus. Government agencies have an important role to facilitate stakeholder coordination.

5. Finally, there are some ecological factors influencing sustainability. The level of scarcity influences the behaviour of users, and there seem to be an optimum level of scarcity (or degradation) which stimulate users to come up with common rules. Harvesting of CPR products can have ecological side-effects on the harvested specie and/or other species. When ecological relationships are complex, government agencies can play an important role in increasing awareness.

### **Acknowledgement**

*Our sincere thanks go to the previous Director of DRDS, Mr. Sherub Gyeltshen, for his strong moral support since the initiation of this CPR program. The Director of DOFS, Director of DALSS, Joint Director of Research, Mr. Ganesh Chettri, and Joint Director of Extension, Dr. Pema Choephel, are appreciated for their kind cooperation.*

*Special thanks go to the contributors of the case studies: Karma Thinley, Dhanapati Dhumgyel, Dorji Wangchuk, Nawang Norbu, Doley Tshering, Tshitara, T.N. Acharya, Kezang Jamtsho, Markus Wespi and Doe Doe. Staff of many agencies kindly cooperated to make the case studies possible: National Mushroom Centre, Jigmi Dorji National Park, Black Mountain National Park, Regional veterinary service at Gedu, Wobtang farm, and the RNR district staff of Zhemgang, Wangdi, Punakha and Chukkha Dzongkhags.*

*Our gratitude also goes to the numerous farmers and collectors who spend time with us, and who enlightened us about the complexity of managing CPRs.*

*Finally, special word of thanks to SNV-Bhutan who partially sponsored this research and who made our participation to the 'First Inaugural Pacific Regional Meeting for Common Property Resources' possible.*

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