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**Common Property and Commercialisation:
Developing Appropriate Tools for Analysis**

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Abstract:

Understanding what is meant by the 'tragedy of the commons' in relation to commonly owned property is fundamental to understanding resource and development economics. Far from being a tragedy, however, common property actually provides many economic, social and political benefits to users. Users of common property organise themselves in various ways using institutions to manage property communally, and the results are often successful examples of sustainable development. Unfortunately, common property has been under increasing threats from privatisation, population growth and other factors. One of the most significant pressures on common property is the commercialisation of products, especially non-wood products from forest-based common property resources. Commercialisation can have many effects on a resource, its users, and the institutions used to manage the resource. This paper develops an analytical model for understanding the interactions between common property and commercialisation, based on a number of case studies. It concludes that common property regimes are not threatened by commercialisation itself, but by the intensity of commercialisation. This intensity is a function of many socio-economic factors, which all combine to determine how a common property resource copes with commercial pressures. Tools for understanding CPRs and commercialisation are suggested, and possible ways to strengthen common property management are presented.

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I. INTRODUCTION

Look after the people and the trees will look after themselves.

— **Old African saying quoted in Food and Agriculture Organisation (FAO), 1986.**

In the 25 years since Garrett Hardin published an essay on the population crisis in Science magazine, the phrase 'the tragedy of the commons' has become commonplace in environmental textbooks and discussions of ecology. Like a Greek tragedy, his premise -- that commonly owned or used property will become degraded because there is no incentive for individuals to contribute to its collective protection - was simple, but absolutely damning in its message.

For years, his ideas were accepted almost universally. Now, however, there exists a large body of literature challenging this notion. Many case studies have shown that commonly held or used property can be protected *by the many for the good of the many*, provided that there is proper incentive and structure in which to do so. Environmentalists and conservationists have increasingly come to realise that these forms of community management, which have undoubtedly existed over millennia, have allowed people to use limited resources in a equitable, low-cost, and ecologically sound way. In other words, the exact definition of the elusive term "sustainable development".

However, the pressures on common property are significant, and, in many cases, increasing. The causes of these pressures include population increases, encroachment by outsiders, and breakdown of governance institutions. This paper will explore one pressure on common property: that of the increasing commercialisation of forest products. As the rural economy becomes more market-oriented and less subsistence-oriented, pressures from overharvesting, unequal benefit distribution systems, outsider profiteering and other problems will most likely arise. These problems can cause unique burdens for resources that are governed collectively.

This paper explores the current literature in common property, forest product use and marketing, and commercialisation of the rural economy in an attempt to synthesise current knowledge on the intersection of all three areas. It is based on a literature review undertaken in both the U.K. and U.S. as well as personal communication with several researchers in these areas. The literature covered includes both theoretical work and field research. Due to the lack of specific research on the

quantitative effects of commercialisation on common property, this paper is necessarily broad, and so is the depth of literature consulted.

As will be shown, the one definite conclusion that can be reached at the end of this study is a note for additional field research in this area. Without such research, however, one is left to draw conclusions of a general nature. I have tried to draw a cautionary picture of the commercialisation of forest products, especially those from common property resources, but that does not mean that marketing is universally bad or that common property regimes are generally unable to handle pressures. The worst conclusion that could be drawn from this research is that marketed non-timber forest products are useless and common-property resources are outdated. On the contrary, both play extremely important roles in the lives of the poor and marginalised, and for that reason alone, caution should be exercised in the exploitation of common property resources and non-timber forest products (NTFPs) by outside forces.

II. COMMON PROPERTY RESOURCES

This communistic system is a sad hindrance to the industrious, and eats like a canker-worm at the roots of individual or national progress. No matter how hard a young man may be disposed to work, he cannot keep his earnings... The only thing which reconciles one to bear with it until it gives place to the individual independence of more advanced civilisation is the fact that with such a state of things, no 'poor laws' are needed.

- Turner, G. 1884. Samoa a Hundred Years Ago and Long Before. Quoted in Holmes 1971.

2.1 Basic Concepts: What is the Tragedy of the Commons?

The issue of who should own property is one of the oldest questions known to civilisation. Aristotle commented on what would later come to be known as the tragedy of the commons by noting "that which is common to the greatest number has the least care bestowed upon it" (quoted in McCay and Acheson 1987a). Others, such as Locke, generally known as a champion of private property, pointed out in his Second Treatise on Government, that "as much as any one can make use of to any advantage of life before it spoils; so much he may by his labour fix a property in. Whatever is beyond this, is more than his share and belongs to others. Nothing was made by God for man to spoil or destroy."

While it is clear that there had been earlier writings regarding property owned communally, an essay by the human ecologist Garrett Hardin caused this issue to leave the realm of the political philosopher and instead to interest development and financial experts. Hardin wanted to emphasise the dangers of unchecked population growth, and so used the phrase the 'tragedy of the commons' to emphasise that common rights -- such as the right to graze a cow, or the right to work or, especially importantly, the right to procreate -- would overpower limited resources and markets. His 1968 paper urged readers to reflect on a growing population problem by using the metaphor of a herdsman who puts his animals on a pasture that he uses in common with other herdsmen. It is rational for each herdsman to add additional animals to the pasture — even though it will result in degradation of the pasture -- because the costs of adding the additional animal are spread throughout the population of herdsmen. In this way, each herdsman contributes to the eventual degradation of the resource even though each was only acting in a rational and self-interested manner. Thus a world which allowed uncontrolled population growth was like that group of herders; each new person born consumed resources and would contribute to the overtaxing of our planet. Hardin concluded; "therein is the tragedy. Each man is locked into a system that compelsTiinr ———

to increase his herd without limit - in a world that is limited... Freedom in a commons brings ruin for all." (Hardin, 1968)¹

His argument appealed to many people. The 'tragedy of the commons' ceased to be a metaphor for the population explosion and instead became a political metaphor. Advocates of private property (the most well known being Demsetz) interpreted that common property was a tragedy and privatisation the solution, particularly in the case of natural resources (Picardi and Seifert 1976. Also cf. Bailey 1992). Advocates of public property agreed that common property was a tragedy but that state ownership was the solution (Hardin and Baden 1977). Proponents of common property were drowned out in the rhetoric for many years².

2.2 Types of Property and Resources

However, the growing amounts of literature on common property (Arnold and Stewart 1991; Berkes 1989; Bromley 1992; Bromley and Cernea 1989; McCay and Acheson 1987b; National Research Council 1986; Ostrom 1990) suggest new ways to analyse and understand these resources and their corresponding management regimes. The authors of these volumes argue that a better understanding of the different types of common property is needed to avoid misinterpretations such as Hardin's. Explicitly defining the varying types of common property, both in terms of actual resources and in regimes for use, helps in understanding the total system of communal management.

2.2. a. Resources

Common property resources are defined using several characteristics (see Oakerson 1986). First, these are resources for which exclusion of potential users is problematic. This can include migratory or fugitive resources, such as fish; or global commons such as the high seas. Forests are often also non-exclusionary because of their inaccessibility, large size, and the difficulties of enforcement. The second characteristic of common-property resources is subtractability: each user is capable of

¹ An important point to note about Hardin's argument is that it was theoretical, and meant to show the danger behind increased population growth. It was not specifically an argument against certain common property management systems per se. Shepherd (1992) states that "Hardin's work on population has thus long ago been superseded. Ironically though, the illustration he used of individual rationality leading to mass irrationality ... still continues to shape the thinking of some natural and social scientists concerned with best human use of natural resources, and to make them fearful of communal resource management." (73)

² McCay and Acheson (1987a) suspect that the reason the 'tragedy of the commons' became such a well-known phrase and subsequently influenced so many policy makers is because it presented a problem to which both liberals and conservatives could attach their respective ideological solutions, i.e.

subtracting from the resource available for others, which creates a tension between individual and collective interests. While in the case of forests, subtractability need not be permanent (i.e. using sustained yield principles would allow products to regenerate for others' use), even temporary subtractability creates management problems in the distribution of benefits and regulation of levels and intensities of use. Finally, common property resources are characterised by indivisibility, in that the resource does not lend itself to partitioning for private consumption. Again, fisheries are a good example of an indivisible resource³.

It is worth noting further the differences among comparable common property resources. **Stocks** are resources for which the physical quantities are more or less fixed; therefore they are exhaustible and non-renewable. Stocks might include minerals or petroleum. **Flows** are resources which are renewable, such as solar energy or water (Gibbs and Bromley 1989, 25). The management regimes that would be successful for these two groups are very different. The amount of a flow resource available at any one time is in a state of flux. Furthermore, in certain flow resources such as forests, how much one takes out can affect how much is replaced because of interference with reproductive and recruitment rates. For flows to be managed sustainably -- that is, indefinitely, in sufficient quantities — management systems must be flexibly established and rigorously enforced, while stock resources need not have this flexibility in use. Flows necessarily then present problems in management, due to incomplete information or lack of biological understanding, for example, which are multiplied in common property situations of many users and managers.

Ecologically, then, forests constitute an unusual common property situation. The degree of subtractability affects not just the people who are subtracting one particular product, but also other potential products as well. Put in a practical but hypothetical way, a collector of palm hearts may affect a collector of Brazil nuts if the palm trees provide leaf litter for the Brazil nut trees' survival. Additionally, the divisibility of forest resources is variable. A monoculture plantation could be fairly easily and equitably divided into smaller bits, yet a tropical rainforest with high species diversity and low species density would be impossible to partition fairly. Thus both the theoretical ideas of jointness -- the degree to which users affect each other's use — and

³ Based on these properties, McCay and Acheson discern that there is often a ecological/seasonal logic for common property. "Seasonally inundated swamplands and wet meadows, mountains, semi-arid and high-altitude grasslands, and so on are often treated as communal property. Among the reasons are the high costs of delimiting and defending boundaries in some environments or for some resources in relation to the benefits of claiming exclusive property. From another perspective, there may be advantages to maintaining access rights to a wide variety of microhabitats in risky and uncertain environments." (1987a: 17) Pérez-Crespo (1991) notes this as well.

divisibility -- how the product or use can best be divided up among users -- are problematic in practical considerations of forests⁴.

Much of the work to date on common property resources has involved either fugitive resources, like fisheries, or simple single-product resources, like irrigation water; both situations often demand collective action for sustainability. Forests are plagued, however, by unique characteristics that make research on management problematic. They provide a large diversity of products and the relationships that exist among users consequently tend to be more complex than for other common property resource situations (Arnold 1993). Forests also generally provide only part of income sources for users (though Jodha (1990) has noted the high significance of common property resources for the poor) unlike pastoralists or fishermen who may derive all of their income from one resource (Arnold 1993). Furthermore, forests contribute to the global 'commons' in providing services such as carbon sequestration (Kramer and Ballabh 1992). It should be obvious that the diversity of forest types and forests products demands diversity in management models. But as Jessup and Peluso (1986) point out, many theoretical models for understanding common property resource use are deficient in aiding understanding of 'systems' resources like forests.

2.2. b. *Property Rights*

Though there are resources that are best managed commonly (as explained above), the existence of a resource requiring common use does not necessarily create a right to use⁵. A right is defined by Bromley (1991) as "the capacity to call upon the collective to stand behind one's claim to a benefit stream....Rights are nor relationships

⁴ A further problem is encountered when considering wildlife in forests. Wildlife behave as fugitive resources - they move - yet they can also be static population-wise and serve important functions in a forest (e.g. agoutis in the Amazon may be one of the few ways Brazil nuts are spread away from parent trees). Different management regimes for the trees in the forests will of course affect the wildlife in the forest.

-> There are a number of different terms used by many authors in explaining common property, including common-property resource, common-pool resource, common-property regime, common property management and common-property rights. I will use henceforth use common-pool resource to refer only to a specific resource, such as a fishery, for which a communal management system would be appropriate. A resource would fit this definition according to the subtractability, exclusionary and divisibility principles. However, a common-pool resource could be under an open-access regime. Therefore, common property regime or common property management will refer to the systems and institutions that govern collective use of a resource. And common property rights can only exist insofar as there are institutions to defend them. I agree with Bromley (1991) that it is technically not correct⁶ to refer to a common property resource, since property only exists in the presence of institutions to defend it. And I agree with Ostrom (1987) in noting that common property resources really should be called common-pool resources for this very reason. Therefore, common-pool resources do not necessarily give way to common-property regimes, but common-property regimes are a necessary prerequisite for common-property rights. I will use the abbreviation CPR to indicate a common-pool resource.

between me and an object...but are rather relationships between me and others *with respect to that object*," (emphasis in original). Rights to use mean nothing if others (the state, other villagers) do not respect those rights (see Barrow 1990). Calling upon others to respect one's right to use is the basis for property rights. Systems of property rights can then include:

- open access: This is the exclusion of well defined property rights. Access is free to all. Open access can also be a result of the breakdown of one of the other three property regimes.

- private property: An owner of private property has the right to exclude others from using the resource and to regulate its use.

- state property: Rights to the resource are vested exclusively in government, which controls access and use. One should note that given the lack of state management and enforcement resources in many developing countries, state property quite often becomes open access, because rights mean little without enforcement⁶.

- common property: A common property resource is held by an identifiable community of users who can exclude others and regulate use of the resource.

These definitions are not so simple, however. There are often a variety of property regimes at work in any one area⁷ (Arnold 1993; Bruce *et al.* 1993; Ngaido 1993; Stanley 1991) Practically, then, resources may be managed under any number of property regimes, depending on user, time and place. As another consideration, land and tree tenure are often different and separable in many developing counties (Baines 1989; Fortmann and Nhira 1992)⁸.

As may be clear by now, Hardin's model of the 'tragedy of the commons' confuses open access with common property regimes⁹. It refuses to recognise that, in

⁶ Berkes and Farvar (1989, 10) quote an old Turkish saying, '*Devletin mali deniz, yemeyen domuz*' (One would have to be a despicable fool not to help oneself to state property.)

⁷ Many anthropologists have noted that property rights are often embedded in historical and social systems that can be very hard to classify in simple terms such as private or common property. See Crocombe 1971 and Malinowski quoted in McCay and Acheson 1987a p 7.

⁸ Bruce *et al.* (1993) and Nhira and Fortmann (1993) believe the concept of tenurial niche is useful in understanding these overlapping tenure regimes. A tenurial niche is a "property claim to certain categories of use on lands under various kinds of tenure" (Fortmann and Nhira 1992, 1). Niches can and do overlap, and when they do, there is often conflict.

⁹ Hardin is hardly the first or last person to make this fundamental error. Economists have long advocated the maxim that "everybody's property is no one's property". Despite recent advances in understanding the economics of common ownership (Runge 1986; Bromley 1989), economists seem

Quiggin's words, "common property is in fact property." (1993, 1126) Clearly, there can be and are situations where common pool resources are managed successfully under collective regimes (either as complete common property rights or a series of overlapping tenure regimes which result in usufruct (legal use) rights for groups). Such examples are explored next.

2.3 Recognising a Community Property Regime

It is difficult to estimate the amount of resources that are managed communally. Governments often include as state property lands that are communally managed, and statistical reports may count productive commons as 'wastelands' (Singh 1989). However statistically dominant state and private property may seem, the commons are important in many countries, not only in terms of total land area, but in terms of value and user dependence (Jodha 1990). Some estimates of the extent of common property include:

- In India, Chopra *et al.* (1990) estimate that 21.55% of India's lands are under common property management regimes¹⁰. This number has declined dramatically in recent years (Jodha 1990).
- In Papua New Guinea, more than 90% of the forested regions are both traditionally and legally owned by communities, comprising 97% of the total island area (Lousman 1992).
- In the Amazonian state of Acre, in which three out of the four extractives reserves in the country reside, reserves now occupy 2.1 million ha. of land (Hecht 1992).

2. 3. a. General Benefits from Common Property

Common property regimes present certain economic and environmental benefits to their users that other property regimes may not. The benefits can be significant, and include:

CPRs beneficial in specific resource base: Common property regimes can be of great use to those in highly randomly distributed resource bases (e.g. where divisibility is

unwilling--(o adapt to the 'new' definition of common property. JThisjs evidenced^by the recent exchange (1990-1991) in the Journal of Environmental Economics and Management between Bromley " and J.S. Clark and G.A. Carlson, concerning ways to 'test' for common versus private property.

" They believe this is an overestimation because it included state forest lands that are often only open-

problematic). For instance, in Botswana, rainfall is scarce and villagers move from one area to another based on rainfall patterns. In this situation, owning much land in common is more beneficial than parcelling out small subdivisions. "The relative access afforded to scarce resources under this arrangement is both more efficient and a better form of insurance against adverse individual outcomes than a system in which a few are blessed by rain while the majority face drought like conditions." (Runge 1986, 631) Therefore, risk sharing among a group provides a hedge against personal failure.

Beneficial to certain income groups: Jodha (1985b; 1990; 1992) has conducted extensive studies on CPRs in India, and he has found common property is vitally important to the poor. His work has revealed that the percentage of poor households depending on items from common property ranged between 84 and 100%. For the richest households, only 10 to 19% relied on common property (Jodha 1990). As seen below, the gap in use between income groups for various products from India's common property areas are significant.

Table 2.1 Relative Contributions of Common Property to Different Income Groups

States	Household Categories	Contributions of CPRs to:				
		Fuel Supplies (%)	Animal Grazing (%)	Household Employment Days	Annual Income (Rs) from CPR	CPR income as % of total
Andhra Pradesh	Poor	84	--	139	534	17
" "	Others	13	--	35	62	1
Gujarat	Poor	66	82	196	774	18
" "	Others	8	14	80	185	1
Karnataka	Poor	--	83	185	649	20
" "	Others	--	29	34	170	3
Madhya Pradesh	Poor	74	75	183	733	22
" "	Others	32	34	52	386	2
Maharashtra	Poor	75	69	128	557	14
" "	Others	12	27	43	177	1
Rajasthan	Poor	71	84	165	770	23
" "	Others	23	38	61	413	2
Tamil Nadu	Poor	--	--	137	738	22
" "	Others	--	--	31	164	2

(Source: Jodha 1990, A-67)

Privatisation is often inadequate: In theory at least, many people assume that private property ownership has advantages over common property. However, the thesis that private property, unlike common property, protects resources from abuse and waste is dubious. Although space prevents an in-depth discussion of the issue of private property and resource protection, "Larson and Bromley (1990) make it clear that private. _

property does not always result in the best use of land, as economists have long argued".

Additionally, as the world has now learned, the privatisation of common property, undertaken ostensibly to halt the 'tragedy' of the commons, has often been a tragedy in its own right. This has been called the 'tragedy of the commoners' (Ciriacy-Wantrup and Bishop 1975). That is, when some individuals or groups are excluded from a formerly common resource if it is privatised, there will be winners and losers, and the poor are most often the losers in this lottery. Jodha (1990) points out that in India, "the privatisation of CPRs in the name of helping the poor brought more land to the already better off households... those who already had relatively more land also received more out of the privatised CPRs. It is quite doubtful whether the poor people's collective loss through reduced CPRs has been compensated by their individual ownership of the erstwhile CPR lands." (A-70)

State management is often inadequate: State intervention is also not a panacea to resource management problems. McCay and Acheson (1987a, 31) note that the instability and corruption of many governments in developing countries either makes state ownership politically risky or, in many cases, the resource in question is too insignificant to the state to motivate it to avert overuse. Additionally, the lack of financial and labour resources in many state governments, especially with regard to low value, dispersed, or distant resources, makes enforcement of state access unlikely and often unsuccessful. Without successful enforcement, situations of overuse are likely to result, turning *de jure* state property into *de facto* open access (Berkes *et al.* 1989).

2. 3. b. Threats to the Resource

Unfortunately, because of the widespread belief that common property management provides few benefits and results in economic and environmental 'tragedy', "nearly everywhere both the resource and the management and use system have come under increasing threat" (Arnold, 1993). Jodha's work in India provides one of the few quantitative bases on which to judge the changing status of CPRs; some of his results are found in Table 2.2 below.

" Aside from the troubling problem of externalities, Larson and Bromley (1990) note that market forces and high interest and discount rates can make it quite economically 'sound' to exhaust a soil with a few crops and then abandon the field. The same is clearly true in forestry.

Table 2.2 Changing Status of CPRs in India

Indicator of Status	States Involved:						
	Andhra Pradesh	Gujarat	Karnataka	Madhya Pradesh	Maharashtra	Rajasthan	Tamil Nadu
CPR Products collected (#):							
In the Past	32	35	40	46	30	27	29
At Present	9	11	19	22	10	13	8
Per ha total number of trees and shrubs:							
Protected CPRs	476	648	662	882	454	517	398
Unprotected CPRs	195	103	202	215	77	96	83

(Source: Jodha 1990.A-69)

These changes are a result of national pressures of state appropriation and privatisation combined with village-level pressures which have served to erode access to common property (Arnold 1993). These institutional pressures are a function of political, economic, and physical changes, including:

Population pressures: High rates of population growth can be a problem, especially in the developing world. As more people try to use a resource, each person is correspondingly able to use less. Jodha (1990) discerned positive differences in the success of CPRs within villages with lower population densities¹².

Migration and resettlement: Migration or resettlement requires adaptation to unfamiliar resources, which may result in inappropriate management regimes. Additionally, the heterogeneous and ahistorical background of groups put together in a common area may provide little social or economic reason to cooperate. In the case of Zimbabwe, Bradley and Dewees (1993) express concern that migrant areas, with no history of institutional involvement in community management, may be at extreme risk of resource degradation.

Appropriation: Resources, especially valuable ones, can often be taken over by local elites, other villages, national governments, or even international entities. Cortez (1986) notes the problems encountered in Papua New Guinea where several Japanese logging companies have signed concessions with clans for clearfelling the timber-rich areas and have essentially taken the areas over; the communal owners have subsequently ended up *de facto* tenants on their own land.

Modernisation: New technologies and new products have significant effects on traditional management systems (Hoare and Larchrojna 1986). For instance, Jodha (1990) believes the promotion of tractors by the Indian government to be one cause of

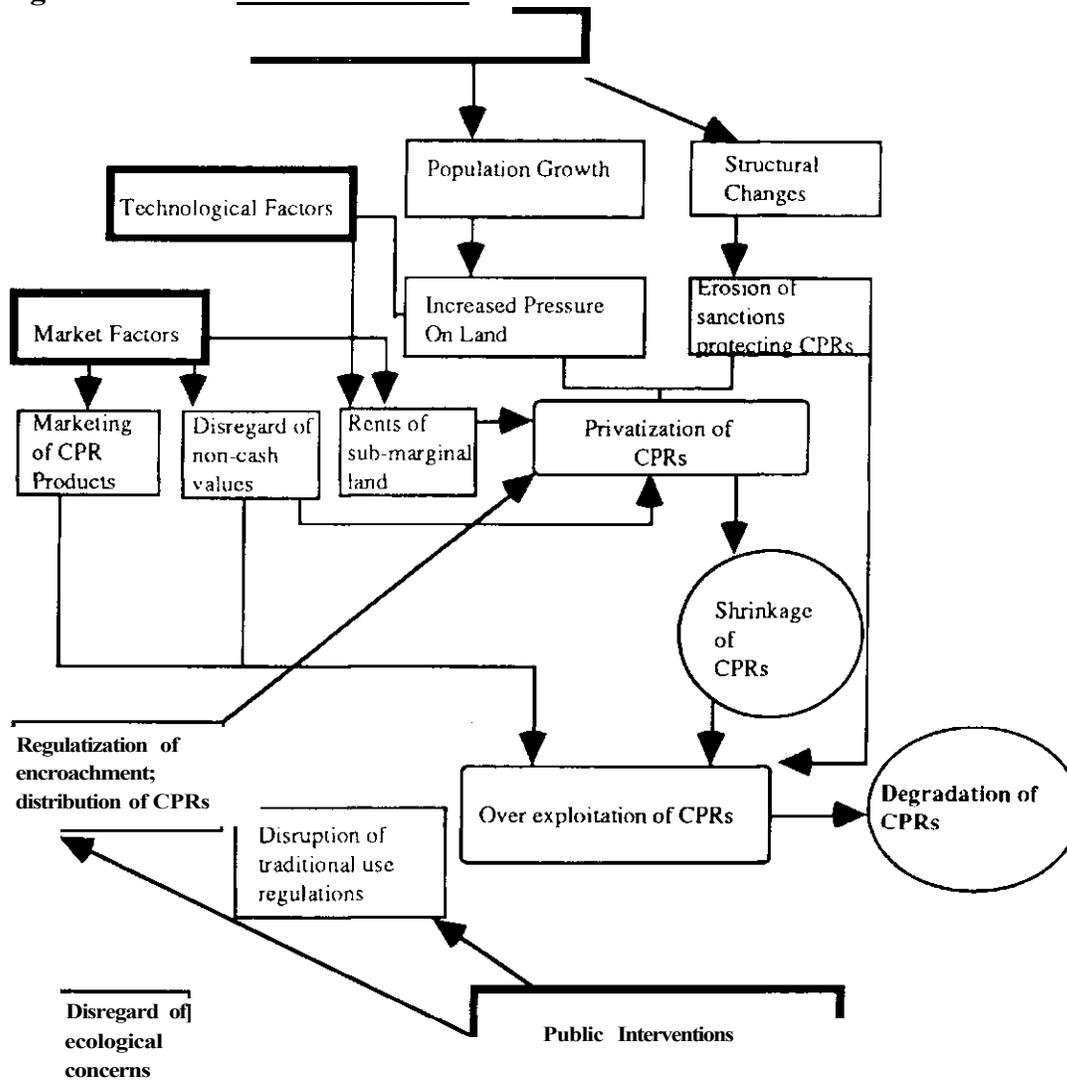
¹² Repetto and Holmes (1983) believe however that population is often a red herring; it seems like the reason for a resource problem when in fact the situation is often much more complicated, involving issues of land and income inequalities.

CPR degradation. Modernisation has also meant that local authorities have been losing authority over traditional communities due to modern economies that promote out-migration and wage employment (Castro 1991).

Commercialisation: It is the purpose of this paper to explore the reasons for and result of commercialisation of common property and common products. As McGranahan notices in the case of fuelwood, "when farmers are producing primarily for subsistence, and the rural political economy is relatively decentralised, common fuelwood collection is the obvious option, and common property regulation is likely to be the most effective response to scarcity. The dissolution of such common property systems is unlikely to be caused by local scarcity, whereas society-wide political and economic changes can easily undermine the institutional basis of common property." (1276) The evidence I will present in the following chapters confirms McGranahan's point by suggesting that the increased value associated with commercialised products often puts extreme pressure on common property management systems.

As will be shown, it is very difficult to place the blame for the decline of common property management systems on one single factor. All the aforementioned problems often work in tandem to contribute to the destabilisation of common property. The complex web of all these interacting pressures can be seen visually:

Figure 2.1 Pressures on CPRs



(Source: Jodha 1990, A70)

2.4 Models for Understanding CPR Governance

In attempts to sort out this complex tangle of CPR interactions, researchers have formed analytical frameworks through which CPRs can be 'dissected' and analysed. Analytical models developed to date to compare CPRs and determine 'successes' and 'failures' in management have focused on three main principles: what the resource is; what decision making arrangement exist; and the structure of the operational action situation¹³. The types of factors used to determine the successful management of common property usually include the following:

¹³ However, many of the models have been used primarily for resources other than forests."Fisheries, rangeland and irrigation management have made up the bulk of studies on CPRs to date. That may be changing, however, with the development of a database for forest systems, the International Forestry Resources and Institutions research program, managed by Indiana University, that will attempt to

Table 2.3 Important Considerations in CPR Analysis

The Resource:

- size and boundary conditions of the resource
- the ease with which it can be used by several or many users (subtractability)
- the ease with which it can be managed to exclude other than members of the user group (excludability)
- its appropriateness for management communally rather than by individuals (indivisibility)
- the role of technology in its management and use, and the cost of alternative technologies
- the availability, structure and stability of markets for its outputs

Decision-making arrangements

- collective and constitutional choice mechanisms: procedures to set and change operational rules
- operational rules: who has access, what actions must may be taken or not taken, what information must be exchanged, limits on user behaviour, ways and means for obtaining compliance, jurisdictional boundaries
- role of external legislation and regulations, and of enforcement and support bodies

Structure of the operational action situation

- number of users, and type of different legal positions they have
- dependence of users on the resource
- patterns of reciprocity and non-reciprocity
- degree of homogeneity in terms of assets, information, skills, cultures, values and payoffs
- efficiency and equity outcomes

(Source: Arnold 1993 after Oakerson 1986)

It is often the latter two categories — that is, the community level rights, rules, incentives and enforcement — that determine the relative success of management regimes. These tools for management often come under the title of 'institutions' for management. An institution consists of the ways in which users organise themselves and others in order to set up decision making arrangements and structures for operational action. An institution need not be formal like a committee. A CPR institution can just as easily be a set of informal social norms that are followed by all user groups.

2.4. a. Role of Institutions

The importance of institutions in maintaining and strengthening CPRs cannot be overstated. Runge explains: "By providing the assurance that others will not misuse common resources, common property institutions can make it rational for the individual

to respect them." (1986, 629)¹⁴ Institutions are not the sole reason for a CPR's success, but they are a necessary condition (Ostrom 1992).

In brief, institutions grapple with the free rider problem by addressing collective behaviour. Inferior outcomes of no cooperation are not always inevitable (as in the prisoner's dilemma) but rather, if an institution can show that it is in an individual's self-interest to contribute to a collective good, he is likely to do so (Runge 1986). Institutions provide answers posed by the uncertainty of collective action by either providing information, or assurances for positive behaviour, or sanctions or rules against negative behaviour.

Researchers from other disciplines besides economists (Runge; Bromley) and political scientists (Ostrom) have contributed to the debate over institutional formation and management and these factors that create collective behaviour for the common good. In the case of anthropologists, instances of reciprocity (where specific individuals have repeated contacts based on mutualism)¹⁵, kin-based behaviour, and group-based behaviour have long been used to explain community cohesion. It is only recently that those studying common property have noted their relevance to community political institutions¹⁶. In fact, in the absence of Western influence or traditions, reciprocity can be one of the strongest community influences in common property management (Hickerson 1973; Ciriacy-Wantrup and Bishop 1975; Saffirio and Hames 1983).

It may be that the way in which institutions form, whether it is internally or from external pressure, or over long periods of time or quickly, is less important than how they actually work. Lawry believes the role of institutions can be summed up in

answer questions about the varying types of management regimes in forested sites around the world (Arnold 1993; Associates in Rural Development 1993).

" There is the caveat that although institutions can provide insurance against free riders or rule breakers, it does not mean that they will (Runge 1986; Ostrom 1992); the total result depends on other factors such as enforcement and outside pressures.

¹⁵ Berkes (1989b) notes that the idea of reciprocity can throw doubt on the outcomes of the Prisoner's Dilemma game. That is to say, if the two prisoners have a likelihood of meeting again in the future, they may be more likely to move toward the cooperation mode, *even* assuming they still do not know how the other will act. Berkes writes, "even in a world full of selfish, non-cooperating meanies, cooperation can evolve from small clusters of individuals who base their cooperation on reciprocity." (1989b, 74)

¹⁶ Biologists too are coming to join those interested in communal management. They maintain that there are lessons to be learned from the animal kingdom in regard to common ownership (Berkes 1989b). Berkes argues that Western population biologists have long been interested in the phenomenon of competition, predator-prey interactions, parasitism, etc., much to the detriment of our understanding of cooperation, commensalism and mutualism. The survival of the fittest Darwin's --- crowning achievement, has been interpreted primarily as competition among the fittest for survival, an individualist strategy. But Berkes (1989b) notes that many population biologists have found that there is cooperation among the less fit for survival as well.

two modes: providing incentives for management and providing authority for enforcement (1990). Rules are the most commonplace form of incentives. They are defined as "generally agreed-upon and enforced prescriptions that require, forbid, or permit specific actions for more than a single individual." (Schlager and Ostrom 1992, 250) Rules and rights are not the same — rights are the product of rules. Rights refer to actions that are authorised while rules create the authorisations. Rules not only create rights but also create duties in that other people must recognise those rights (Schlager and Ostrom 1992, 250).

How those incentives/rules are developed and who does the developing, however, is crucial to their enforcement and legitimacy. Ciriacy-Wantrup and Bishop (1975) see a three-level hierarchy evolving in most CPR institutions: the operating level, where agreed upon rules or social norms are followed; the institutional level, where regulations on decision-making are made, which sets new rules and new enforcement mechanisms; and the policy making level, where changes in the institutions themselves are made. Users need not participate at all levels; for example, those who already exercise a right may not necessary need to participate in the definition of future rights to be exercised (Schlager and Ostrom 1992). The institutional level which sets future rights is thus a powerful organ - one that can manage users, exclude users, and alienate users (sell or dismiss rights of use).

What then are the forms that institutions take? They are many and varied, but a few examples are useful in understanding the divergent roles institutions can play.

Informal Institutions:

Informal Cooperation: Anthropologists around the world have noted that people often get together to help one another in the absence of kin or cultural ties. Such cooperation might seem inimical to individual gain, but in reality, cooperation provides both buffers against unexpected events and improves reciprocity relationships that provide long term benefits. This phenomenon has been noted even in difficult colonial frontier life in heterogeneous Latin America communities. Weil (1989) remarks that in "the peasant economy in the tropical Chapara colonisation, one could not function with an emphasis on competitive individual enterprise. Daily instances of good will - even to the point of self-sacrifice - may have been vestiges of generalised reciprocity... by imposing restraints on some aspects of socio-economic development in a market economy, the peasant... migrants enhanced their prospects of survival in the modern world"-(331)

Social/Moral Controls: These controls often develop over long periods of time, and can often be based on religious and cultural norms. Among the Ju/hoan (formerly termed Bushmen) in southern Africa, social customs are still very strong in regulating land tenure and use. Consensus is a important community attribute in making any decisions. This absence of hierarchical leadership and presence of power-sharing has evolved over hundreds of years into systems for sharing as an important resource distribution mechanism; stewardship rather than ownership of land; and absence of activity specialisation in favour of community flexibility (Bieseke *et al.* 1992). As one example of a social norm, "enormous bad feeling would ensue if one person refused to share the morama or mongongo [beans and nuts] resource with someone from even a distant nlore [community]." (Bieseke *et al.* 1992, 25)

Religion often plays a strong role in institutionalising resource management as well. There can be seasonal restrictions on use of some forest products due to worship rites (Malhotra *et al.* 1993). Folklore and taboos play a large role in allocating tenure and use rules in Nigeria (Osemeobo 1994). Religious codes can often be some of the strongest in withstanding pressures of change. Chandrakanth¹⁷ (pers. comm., 1994) notes that even in parts of Kodagu, India, where culture is highly westernised with "automobiles on most farms", sacred groves are not used for commercial products and are still guarded heavily.

Formal Institutions:

Local Traditional Heads: Traditional chiefs or headmen still have power in many areas. Fortmann (1986) found that in Botswana, even if the present chief was not liked personally, most people tended to have great respect for the office itself. Chiefs, where they still have power and inspire respect, can be powerful protectors of CPRs. In some cases, however, chiefs are no longer picked by hereditary or age lines. Fortmann found that in Botswana, 45% of the headmen were hereditary leaders; 30% were chosen by the village in some fashion; and 25% were chosen in some way by outsider forces. Chiefs in the latter category often received little respect because they were considered 'outsiders' themselves, though they were from the village (Fortmann 1986).

Other Local Institutions: Other groups that involve large numbers of villagers, such as self-help groups, borehole syndicates, or women's groups, may be able to mobilise for common property management. Fortmann notes that their success is often contingent

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on their perceived legitimacy and fairness in representation (1986). Cernea (1989; 1990) and Stewart (1991) believe user groups such as these to be strong local forces in managing both private and public lands. However, even if a village respects their local organisation, the government or outsiders may not.

Village Committees: Van Panchayats¹⁸ have been set up in many parts of India as village level committees to regulate the day to day affairs of village common forests. Ballabh and Singh remark that "the Van Panchayats are required to develop instrumentality: (i) to exclude people who do not have any right in the forest; (ii) to prevent encroachment; and (iii) to devise rules and regulations for the use of forest resources by the right holders" (1988, 13). The Van Panchayats often suffer from being factionalised or politicised, as do many other village committees, particularly because they are the lowest rung in India's formal government and members are often selected by outsiders (Arnold 1990; Blakie *et al.* 1986).

District Councils: District councils tend to be an amalgamation of several smaller groups of villages. However, these committees may cross arbitrary boundaries and be based on population, not on homogeneity, and have little to do with communal structures at the village level (Bruce *et al.* 1993). If district councils are imposed by outsider organisations, like the state, then it is likely that their management of a resource will be no more effective than state management itself. District councils seem to be most successful when dealing with several small, homogenous groups, not with widely dispersed and different populations (Blakie *et al.* 1986; Scoones and Matose 1993).

Some further examples of levels of institutions, representing state, private and communal interests, can be seen in Table 2.4:

Table 2.4 Examples of Institutional Channels for Decision Making

Levels	Sectors		
	Governmental	Participatory	Private
International	Bilateral donor agencies	International co-ops	Multinational corporations; external NGOs
National	Central government ministries	National co-operatives	National NGOs; national companies
Regional	Regional administrative bodies	Watershed co-ops	Regional NGOs
District	District council	District soil co-op	District firms
Sub-district	Ward council	Marketing co-ops	Rural enterprise
Locality	Extension office	Forest protection group	Town businesses
Community	Village council	Primary co-op	Village shop
Group	Caste group; neighbourhood group	Users groups	Micro enterprises
Household	Citizen	Member of co-op	Customer

(Source: Adapted from Uphoff 1992)

2.4. b. *Characteristics of Success*

With all of these varying types of institutions and organisations, the natural question to ask is which ones are mostly likely to succeed? **Appendix One** presents several case studies of common property management, from the less successful to more successful. The cases come from around the world, including analysis of extractive reserves in Amazonia; wildlife management in sub-Saharan Africa; use rights in a biosphere reserve in Guatemala; ethnohistorical studies on the North American fur trade two centuries ago; and open-access to state forests in the U.S. All the cases were selected because they involved the commercialisation of a product managed under a common-property regime. [Chapter 4 will deal in depth with lessons learned from these case studies regarding commercialisation impact on CPRs.] In each of these cases, a variety of institutions, both formal and informal, are at work, and several are more successful than others. Though it is difficult to generalise about property management regimes on differing resources, with regard to successful institutions themselves, Ostrom (1992) has analysed similar case studies that were presented at a 1986 conference on common property and concluded that a formal institution, especially one created locally rather than externally imposed¹⁹, is more likely to survive if the factors in Table 2.5 are realised:

¹⁹ Externally imposed groups tend to fail on several counts. Authority may not truly shift to the local users. Formal institutions, such as non-governmental organisations (NGOs) often tend to have a philosophy of local management that reads: you can make decisions as long as they are the ones we

Table 2.5 Factors Leading to Institutional Success in CPRs

The organisation devises a small set of simple rules related to access and use patterns agreed to by appropriators.

The enforcement of these rules is shared by all appropriators, supplemented by some 'official' observers and enforcers.

- The organisation is constituted with internally adaptive mechanisms.

The appropriators from the CPR are able to sustain legal claims as owners of the CPR.

- The organisation is nested in a set of larger organisations in which it is perceived as legitimate.

The organisation is not subjected to rapid exogenous change.

(Source: Ostrom 1992, 304)

2.5 Commercialisation and CPRs

I have spent a long time building up the background to common property management and how it originates and how it is formalised. It is now time to return to the question of the role of commercialisation in creating pressures for CPRs. It is easy to see how commercialisation could conflict with Ostrom's general institutional factors in CPR success from Table 2.5. Consider the situations I pose in Table 2.6:

Table 2.6 Commercialisation Situations and Institutional Pressures

Simple rules are unlikely to be workable if a commodity has high value. Incentives for appropriating the commodity and not cooperating are correspondingly high.

- Enforcement of rules is likely to be complicated by high-value items, especially if the item is wanted by elites. Bribes and coercion to escape enforcement are more likely when high value products bring in cash. Even outside observers can be bribed.

Many organisations may not be flexible enough to adapt to rapid changes induced by commercialisation. There may be no current rules on commercial products and there may be no past rules to learn from.

High value CPRs and commercialised products create incentives for outsiders and the state to appropriate the land and dispute legal claims.

Legitimacy of CPR use is contested by regional, national, or international organisations who see their interest at stake in use of a resource or commodity.

j Commercialisation is by its very nature rapid exogenous change.

Although the above are merely theoretical hypotheses at this point, I hope to show in later sections of this paper that they generally hold true with reference to case studies in Appendix One and elsewhere. It is useful at this junction, then, if we accept that

want you to make (Fisher 1993). External arrangements often tend to not be as flexible or to consist of inappropriate membership (elites are chosen because of their visibility) (Fisher 1993, 9).

commercialisation *has the potential* for CPR destabilisation, that we look at the specific roles CPR institutions play that might affect or counterbalance commercialisation. Common property management regimes have a number of duties in regulating resource use, from setting user fees to enforcing rules. There are certain aspects of CPR institutions that are particularly relevant for adapting to the commercialisation of products. These include:

Dispute Resolutions: One of the key roles of institutions is in dispute resolution. This can be especially relevant when appropriators become more interested in using a high value commercialised resource, or they further intensify their current use such that they conflict with other users. Blomquist and Ostrom (1985) suggest non-institutional dispute resolution is impossible (this is probably especially true in situations of high value commodities). They propose an model to resolve 'commons dilemmas', one that uses institutions to facilitate cooperation²⁰. In other words, an institution in a commercialisation situation can help provide: information about use patterns and their sustainability, in order to avoid overharvesting; communication among users in the form of marketing co-operatives so everyone knows how each other user is benefiting; distribution rules that either limit harvesting for commercial purposes or else provide equitable sharing for all in the profits; enforcement mechanisms, such as through marketing co-operatives where selling of CPR produce is not allowed for outsiders; and monitoring, perhaps through a state or regional commodity agency.

Rose (1992) has found that conflict in CPRs normally focuses upon some aspect of resource management, access, distribution or use. She has determined, using several case studies, that rules defining external relations constitute the major source of conflict. She notes: "Such rules tend to be unclear, unacceptable to local groups or unenforceable." (27) Other disputes often arose when: rights were not equally distributed; when benefits were not equally distributed; when people were competing for access to a scarce resource; and when users were not granted full participation in management.(29). Conflict resolution rules are then clearly one of the most important parts of institutions. Furthermore, as conflicts are often inevitable, particularly with large numbers of users or dwindling resources, conflict should be looked upon as an opportunity to manage better -- not as a sign that things are falling apart (ARD 1992b; Rose 1992).

²⁰ In this model, group mechanisms work together to solve the commons problem. This would entail: information accessibility (not the question of does everyone have perfect information, but if the institution can help provide better information); institutionalised communication channels (e.g. a traders cooperative, or a court) where interaction among users is facilitated; institutional cost-sharing rules that account for the asymmetry of use; enforcement through contingency contracts; and monitoring through a institution or outsider interest (Blomquist and Ostrom 1985).

Benefit Distributions: As noted previously, a particularly problematic role for CPR institutions is that of benefit distribution²¹. This is especially pertinent when discussing the problems of commercialisation, which necessarily assigns values and marketability to products that were once commonly owned, used or shared. Examples of rules to distribute benefits might include: taxes on collection or sale of products that accrue to a village fund; selling CPR produce to a local co-operative, whose profits are shared equally among members; or contracting out CPR collection with net profits to a village trust. Park (1993), however, notes that in much of semi-arid Africa, CPR benefit distribution systems are often highly unequal, but these are accepted by members because they are based on historical factors that, for example, give one family or clan more power or prestige.

User Access: Bruce *et al.* (1993) notice that "a vexing problem in the analysis and resolution of tenure conflict is the evolving definition of insiders and outsiders. A major issue, particularly for indigenous woodlands in communal and resettlement areas, is the control of activities and demands of outsiders." (639) This can sometimes be alleviated by rules such as a regulated length of time that must be spent in a village before harvesting of forest products can take place. However, if in-migration is significant, these regulations are unlikely to protect the resource.

Controls: Use rules are explicit controls over the behaviour of users of a resource. Rules must be flexible enough to change with conflicting circumstances, but yet strong enough to be enforced and respected (Lawry 1990). It is a difficult balance to strike. Rules relating to commercialisation most likely should refer to either environmental sustainability or economic sustainability or both (e.g. rules to prevent overharvesting or rules to prevent appropriation of resources).

Bruce *et al.* (1993) refer to four sets of controls on woodland management in Zimbabwe's communal areas. **Pragmatic controls** are rules and norms of trees use designed to achieve sustainable yields -- i.e. a prohibition on cutting down fruit trees²².

²¹ In an example of poor benefit distribution, Menzies and Peluso found in Southwest China that timber from common lands had recently been commercialised in several villages, under the new plan by the Chinese government to encourage some forms of a market economy. The benefits from the sale of the timber are, at least on the official books, supposed to be split 40-60, with 40% to the farmer who had previously had usufruct rights to those particular trees, and 60% to the village collective which had harvested the timber. Interviews with community members revealed that most did not even know of the profit sharing scheme, or if they were aware of it, they had not yet seen any money from it.

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Overlapping and uncertain tenure schemes seemed to be contributing to the problems with benefit distribution (1991).

²² Gadgil and Iyer (1989) and Fernandes, Menon and Viegas (1988) note similar series of pragmatic rules as Bruce *et al.* In India, there are five main pragmatic controls: quotas or limitations on total seasonal or daily use; closed seasons; protected types of products (for example, only fallen fruit);
:— ;,,,i,,,;H,,ai <ivr.ies: or protection to entire communities of trees.

Sacred **controls** are based in folk belief and religion and are enforced by community sanction or religious leaders. **Civil contract controls** are norms of civility that govern conduct, such as mores against stealing fuelwood from a neighbour's pile, which may or may not be backed up with religious sanctions. And **emergent controls** are those created by the community for the enforcement of new or flexible rules on tree uses. The authors notice that the main controls in indigenous woodland in Zimbabwe are usually pragmatic and civil contract. [See **Appendix Two** for examples of use rules from around the world.]

With regard to commercialisation, civil contract or informal controls may not withstand the economic pressures to break use rules. Sacred controls, while they may remain strong, do not necessarily apply to the commercialised species or product. Therefore emergent and pragmatic controls are likely to be the most successful. These are not without their problems though; pragmatic controls may be inflexible, and they are useless without monitoring for enforcement; and emergent controls, while useful if implemented, may face a significant political opposition in their passage by people mobilised for the possibilities of economic advantage.

Enforcement: How and who enforces rules are as important as the rules themselves. Types of enforcement might include: hired watchers paid for by the group; villagers voluntarily taking turns; special village groups (herders, hunters) taking responsibility; or each individual pledging to turn in rule breakers he sees (Arnold and Campbell 1986). Commercialisation is likely to have an impact on enforcement through: making bribes to guards economically feasible; providing incentives for groups to work together in not cooperating with the larger group (e.g. hunters taking extra bush meat for sale and conspiring amongst themselves to hide it from the village); or breaking down individual moral norms of self-enforcement in the face of economic advantages.

A general example of the problems in creating and enforcing rules comes from Jodha (1990). His research in India has revealed some historical declines in CPR management rules over time.

Table 2.7 Historical Trends in CPR Rules²³

State (with number of villages surveyed)	Formal/Informal Regulations on CPR use		Formal/Informal Taxes or Levies on CPR Use		Users Formal/Informal Obligation Towards Upkeep	
	Past	Present	Past	Present	Past	Present
Andhra Pradesh (10)	10	0	7	0	8	0
Gujarat (15)	15	2	8	0	11	2
Karnataka (12)	12	2	9	0	12	3
Madhya Pradesh (14)	14	2	10	0	14	3
Maharashtra (13)	11	1	6	0	10	1
Rajasthan (11)	11	1	11	0	11	2
Tamil Nadu (7)	7	0	4	0	7	1

(Source: Jodha 1990 p A-71)

It is clear in this example that rules and enforcement have broken down over time. There are unfortunately few other quantitative examples of decline similar to Jodha's.

2.6 Summary

Misunderstanding about common property has led many to underestimate its prevalence and extent of benefits. Common property regimes are in fact complex apparatuses of rules, regulations and enforcement that govern collective behaviour in resource use. The success, in qualitative terms, of CPRs appears to hinge on the ability of institutions to provide incentives for communal norms of behaviour, and to establish firm local and national recognition of legitimacy for these institutions. However, pressures from inside and outside a CPR may contribute to the destabilisation of management regimes. One such pressure that may be significant is that of commercialisation.

²³ In Table 2.6, 'in the past' refers to the pre- 1950s (before much commercialisation or privatisation) and 'at present time' refers to the 80s when the field work was carried out.

III. COMMERCIALISATION AND MARKETING OF FOREST PRODUCTS

"Clearly, the best way to protect the viability of forest communities and to ensure the future of their resources is to expand the market for rainforest products"

-- L. Baker, *Cultural Survival*, 1989

In order to understand the effect commercialisation has on forest based CPRs, we need to look at commercialisation: what it is, how it occurs, and the lessons we have learned from past experience with commercial products. This chapter attempts to do that, by outlining role of trade in non-market and market economies, and by looking at how commercialisation of some products (both agricultural and forest-based) has generally affected social, economic, political and biological systems. These historical lessons will be of great relevance in attempting to predict or account for the results of commercialisation in forest based CPRs.

3.1 Commercialisation Processes

To commercialise is to market (i.e. price) those products which were normally subsistence or free goods²⁴. Historically markets are a new phenomenon; communal hunting and gathering societies often had no surpluses, and therefore no need of markets. As societies evolved, trading became possible, and trade and information relationships were established (Ciriacy-Wantrup and Bishop 1975). Whatever the reason for the creation of markets, it is clear that they do exist in all forms, in all kinds of societies. In a way, we can understand a market the in the same fashion we understand common property. The way people operate in a market is often similar to the way organisations manage CPRs (cf. Jessup and Peluso 1986). Organisations are formed and alliances made in a market to maximise penetration and profit, much the same way organisations are formed to maximise productivity of a CPR²⁵. Markets

²⁴ The idea of free goods is of course misleading. Harvey (1990) says that "free goods are of no interest to the economist since resources do not have to allocated to obtain them. Nor is the mere scarcity of means necessarily of significance. Where resources can be used only in one way ... they do not, although scarce, have to be economised" (7). Of course free goods are not always free -- there are labour costs of obtaining them, the opportunity costs of not doing something else, and the good used subtracts from those available for others.

²⁵ Belshaw, an anthropologist, writes: "Local Javanese traders, lacking a kinship system in which lineage defines membership in a corporate group, use other methods ... to establish cooperation.... Some group formation is necessary to enable local traders to achieve economies of scale and to bargain effectively. The pooling of capital and skills in a group, membership in which is voluntary and mobile, means that specialist functions can emerge, so that within a group one member may buy from another, another hold stock, another conduct transactions.... In Bali, such groups have more formality

share other things in common with CPRs besides the need for organisation. Markets (at least free or 'perfect' ones) cannot exclude people from participation (in the absence of monopoly) (Carroll *et al*, 1979). This means excludability is a problem. At the same time, the more people join a market selling the same product, the lower the products price will be (if we accept basic supply and demand principles). In this way, each new entrant subtracts from the profit of the other participants. Thinking of a market in these terms we have associated with CPRs may help in understanding why markets can pose difficulties for sellers, especially the poor.

3 1. a. *The Commercialisation Process and How Markets Operate*

It is interesting to note that England's role in world trade began based on raw wool (Harvey 1990). It was this commercialised demand for wool that most likely precipitated the enclosure of the commons in pre-industrial England -- not that the commons were degraded (McCay and Acheson 1987a). Clearly markets and common property have been interacting for quite some time. Therefore, we could learn a bit about commercialisation processes by looking at the commercialisation of agriculture²⁶ which has a longer history than commercialisation of forest produce. Our experiences with the contrast between subsistence agriculture and cash cropping are revealing. There are many reports of subsistence agriculture being abandoned (either willingly or coerced by tax incentives or government programs) with the cash income possibilities presented by cropping for trade and export (Hoare and Larchrojna 1986).

One should not, however, assume that all societies want to be part of the cash economy, although it seems a tempting idea for many. Dove (1990) notes in a review article²⁷ that the farmers in many Javanese villages sell in markets only out of necessity, as a growing population has made it difficult for the village resources to aid all the villagers. He notes that researchers have found that

villagers are inherently and rightly suspicious of all outside institutions such as markets, and they favour a subsistence lifestyle whenever possible....proof for this thesis is in the fact that it is the poorest farmers in Sriharjo (and hence the farmers with the fewest other alternatives) who sell

and are sometimes based more specifically on kinship ties or a sense of social obligation and loyalty as between, for example, ruler and people." (1965, 66)

²⁶ Time and space prevents a in depth look at this subject. One good book, though, is by D. Feeny (1982) who outlines a comprehensive economic history of the commercialisation of rice in Thailand between 1880 and WWII. His basic conclusion is that though rice exports increased 20 fold, living standards barely improved or became worse.

²⁷ Dove reviews the book Pekarangan, Petani dan Kemiskinan: Suatu Studi tentang Sifat dan Hakikat Masyarakat tani di Sriharjo Pedesaan Jawa (Home Gardens, Farmers and Poverty: A study of the Features and Facts of the Farming Community in Sriharjo, Rural Java) by D.H. Penny and M. Ginting. 1984. Yogyakarta: Gadjah Mada University Press. Original in Indonesian.

the greatest percentage of their home-garden products to the market(Contrary to popular belief, that is, the rich farmers are the most subsistence-oriented, and the poor farmers are the most market-oriented.) (157)

In specific reference to forest goods, De Beer and McDermott (1989) believe that two key factors have influenced the commercialisation of forest products, particularly non-timber forest products (NTFPs) and the rural economy in many countries, regardless of what types of products are marketed. One factor is the increased penetration of a cash economy into all aspects of life. The use of cash has broken down the trust and reciprocity between trader and collector into short term relationships based on expediency. Secondly, the nature of the trade in NTFPs has changed. Globalisation has meant that all countries compete with one another and that small changes in a market in one country can mean big repercussions for another (de Beer and McDermott 1989, 108-109).

3. 1. b. Local vs. International Markets

It is not enough to note simply that products are marketed or not. We must ask questions about how and where they are marketed. For instance, is there a difference in trade between local and international markets? What are the links between the two? And can we even separate the two? These are all questions that must be asked when determining the influence of the market on forest-based villagers' lives.

Local Markets: At the local level, observers have noted that the commercialisation of gathered forest products in rural areas is fuelled in large part by the growth in urban markets. These local markets may tend to be more stable over time than international commodities because they often focus on staple items with steady demand. Local markets can be very important to rural people who lack the means of competing on a higher level. This role of the local market should be emphasised by 'green' marketing companies seeking an expanded market; too often local markets are ignored in favour of international ones²⁸.

Comparisons of regional and international trade are often markedly different. Table 3.1 compares the trade in regional and international markets for NTFPs in Brazil. Trade is certainly different for a few items; brazil nuts are worth far more internationally than they are regionally. Babacu oil is worth nothing internationally mainly due to

²⁸ However, local markets can cause supply and demand problems just like international ones. Overharvesting of fruits for a regional market in Iquitos, Peru has resulted in many species becoming rare in recent years (Vasquez and Gentry 1989).

substitution availability of many higher-quality oils (May *et al.* 1985b). Acai is also not an export item, and this may have to do with the processing and distribution problems associated with fruits. More generally, Table 3.1 demonstrates the strength of regional markets: the total regional trade in seven NTFPs is worth more than the international trade.

Table 3.1 Regional and International Trade in Amazonia in 1987

Product	Value of Regional Trade (US \$)	Value of International Export Trade
Latex	\$ 21,000,000	\$ 7,000,000
Açai	\$ 42, 000,000	none
Palm hearts	\$ 11,000,000	\$ 30, 000,000
Brazil Nuts	\$ 9, 000, 000	\$ 29, 000,000
Babaçu oil	\$ 22, 000, 000	none
Jaborundi ¹	\$ 1, 000, 000	\$4000
Buriti fibres ²	\$ 500,000	none

1. *Hymenaea courbaril* (medicinal plant).;

2. *Mauritia flexuosa*

(Source: Vantomme 1991)

International: Commodities on the world market face several problems: there must be a demand; they must be able to be transported cheaply in large volume (hence no international fuelwood trade — the product is high volume and low price) and the good must be durable (e.g. wild fruits often cannot be transported far) (Wickens 1991). The result of these difficulties may be the exclusion of small co-operatives (such as could be formed from a CPR) from international trade. The dominance of larger companies for international trade also means that the production and trading sources often get more distant; this could have implications for sustainability. A local co-operative is more likely to be sensitive and yet flexible to production changes (e.g. a drought may weaken trees so resin production may need to be scaled back one year) than one distant from the resource base.

But what is the benefit of internationalisation? International markets can often offer higher prices for goods. Many 'green' marketing companies want to seize upon these higher prices paid at an international level, and have thus focused on developing forest products primarily for international (Western) markets (Baker 1989; Clay 1992a; 1992b; 1992c; Dixon *et al.* 1992). Internationalisation "can also increase forward-and-backward linkages for some commodities (Harvey 1990), providing even more income to producer groups and exporting countries. But do increased prices encourage

conservation, the ostensible goal of conservation organisations? Larson and Bromley (1991) think not. They use the example of gum arabic, which has been commercialised a long time, to make their point. They note that a jump in the producer price of gum in the middle 70s caused approximately 80% of the acacia trees to be killed by overlapping, in spite of the long history of gum trade in the Sudan.

There are two reasons for this: one, the poverty of the area meant that future environmental benefits of not overtaxing the trees meant little. In some senses, it was economical to overexploit. Two, as there was no certainty about how long the high prices would last, the incentive was to harvest immediately before prices went back down. Would strong CPR management have prevented this outcome? It is unlikely that CPRs could have provided incentives strong enough to counter the economic draw of overharvesting. It is only with long-term, stable, and high prices that resources are able to generate future returns, thus making them valuable in the short term (Larson and Bromley 1991). Is this possible for many NTFPs, especially on the international market? With such incomplete information on many of the newer products, the answer would have to be 'no' in some cases. As we can clearly see in many cases, markets alone provide no institutional incentive for proper management of forests (see Peters *et al.* 1989; Pinedo-Vasquez *et al.* 1990; and Vasquez and Gentry 1989 who all provide case studies or overexploitation of forests in Amazonia for commercial products). However, it is possible that markets operating within a CPR may be able to provide incentives for management, provided the incentives for cooperating generated by the CPR overpower other economic incentives for overexploitation or privatisation.

3.2 Benefits of Commercialisation

As many difficulties as there are in marketing NTFPs, there is no doubt that commercialisation of forest produce can be important for local communities. The increased mobility and prestige that cash income provides makes commercial trading a prevalent part of even the most remote settlements. Some other benefits of commercialisation include:

Flexible/Easy Income: In the case of lontar palm (*Borassus sondaicus*) in Indonesia, villagers are able to benefit from the commercialisation of its products in two ways: one, the cash comes when other labour demands are scarce; and two, the palms grow on sites that are agriculturally marginal, and they require little encouragement to grow. Therefore the returns to labour for promoting and harvesting are high (Anderson 1987)._____

Women's role in marketing: Women frequently play a key role in the marketing of products, especially those that were formerly gathered for use in households (Packham 1993; Moreno-Black and Price 1993). Moreno-Black and Price (1993) found that marketing gathered food products provides women with cash income that can help increase their status, especially in countries like Thailand where cash gift-giving to monks and temples is an important social role. They found that of the women they interviewed who sold gathered food, the women generated 67% of the cash income of the household. Additionally, 84% of the women had sole control over how their own money would be spent. Others (Falconer and Arnold 1990; Horowitz and Jowker 1992) have speculated that women with control over cash income spend it on household items and can contribute significantly to increased nutritional levels for the family.

Cultural strength: Many authors have noted that when a commercialised item has cultural significance or is part of historical ritual, the community often works cooperatively in harvesting or marketing it (Makuku 1993; Panoff 1971; Sorenson 1993). Stephen (1991) further notes the effect commercialisation of native crafts, some made from forest products, has had on four Latin American communities. She writes:

While in many cases craft production for export has exacerbated increasing economic and political marginalisation of the producers, in some instances craft production has resulted in self-managed economic development that strengthens local cultural institutions....In these cases, self-management and successful entrepreneurship are linked to an internal reinforcement of local cultural identity. (1991, 101)

Stephen believes this success to be a result of historical roles in independent craft production for the market; strong social institutions such as reciprocal labour exchanges and extended kin networks and high levels of ritual activity; a high degree of control over marketing and distribution; and reinvestment of income earned in community institutions²⁹. Clearly, these social structures cannot be replicated in many areas, but her findings are nonetheless enlightening .

Goldsmith shares a similar story from Kenya. There, miraa (*Catha edulis*) is a tree which produces leaves and shoots which are chewed as a stimulant. The commercialisation of this product has not seemed to affect either the resource base or the social networks surrounding management and marketing. In fact, social networks based on trade seem to be stronger than many kin-based social relations. Trading is

²⁹ Stephen notes that these factors were possible in her four case study areas due to historical social and economic factors that allowed for maintenance of a sufficient land base; commercial experience in marketing; and integration of craft activities into social and institutional systems.

based on trust — with few records and contracts — and those traders who try to deceive or cheat clients "lower their standing within their own communities and risk curtailment of the reciprocity that acts as an important mechanism ensuring supply and security to traders." (Goldsmith 1988, 144)

Goldsmith sees several reasons for miraa's continuing success after commercialisation: group affiliations among traders are possible because miraa production for all of East Africa is centred in one area; miraa strengthens social bonds between age groups by emphasising the transition from young trader to older; and, in spite of modernisation, older traders still gain tremendous respect for their knowledge of the trade.

Hart makes a similar argument of the Mbuti³⁰ in Zaire; "the replacement of the Mbuti's subsistence economy with a wider commercial system has not necessitated a reordering of their social priorities. On the contrary, market hunting may actually enhance the communal structure of the Mbuti's band life. The net hunt is the basis of the Mbuti's economy and all members of the community may participate in it...In effect, the net hunt is as much a social event as it is the means of subsistence." (337)

Decreased land pressure: The commercialisation of processed forest and on-farm fruits for urban markets by the Ikalahan tribal group of the Philippines has created a full time gathering/processing activity for about 150 households. Each house formerly prepared about 2/3 ha/yr. as a swidden fallow from the forest; half of the output went to the family and half to cash. Now that cash is available from the fruit, many families have voluntarily reduced their swidden size (saving themselves agricultural labour) and are letting about 1,000 total acres of fallow land revert permanently to forest (Rice 1994, 337). Additionally, many commercialised NTFPs grow on agriculturally marginal soil (e.g. lontar palm) and therefore provide income from what might be termed 'useless' land (Anderson 1987).

3.3 Disadvantages of Commercialisation

Despite these benefits, commercialisation of NTFPs has many disadvantages. The results of commercialisation vary widely, depending on type of product (staple or luxury good; low value or high value; low volume or high volume; from primary or secondary forest or smallholder plots; etc.) and the degree or intensity of

commercialisation (local or regional markets; national or international trade)³¹. Some of the socio-economic, political and biological changes that occur with commercialisation are outlined below. (Again, not all these changes may be universally bad. It is often the ability of the community using or producing the product to adapt to this change that determine the success or failure of commercial schemes.)

Social Stratification: Peluso notes (1992b) the dissolution of established trade contacts based on mutual obligation and trust is resulting in the "semi-proletarianisation of some forest-dwelling people of East Kalimantan as the mode of production for rattan goods changes," (62) from household production for subsistence and local trade to contracted commercial harvesting for large processing factories. It is not at all uncommon for gatherers of NTFPs to be exploited by middlemen with whom they must trade to reach the market (see Case Studies One and Three in Appendix One).

Social Conflict: With social stratification often comes conflict. For the Mbuti, a close knit social group, where hoarding and not sharing all possessions "produces discord within the band and may even bring ostracism to the owner" (Hart 1978, 349), the introduction of money, a easily hidden and compact item, has allowed hoarding to happen in secret. Money is never traded communally.

Dove (1990) reviews recent research in Java that contends that involvement in market processes has contributed to a deterioration of the local economy, which has then put stress on the social relations of the village. Neighbours no longer allow free access to their homegardens for those in the village in need. The households no longer practice reciprocal assistance for the staging of domestic rituals. The proof of the link between the market and social problems is found by looking at transmigrants from Java to Sumatra, where a more subsistence-oriented lifestyle is practised. There, away from the market economy of Java, these communal customs have actually been revived.

Stress on labour systems: Even those groups acclimated to a commercial culture may find their labour systems skewed in favour of commercial production. The bark paper makers of Otomi, Mexico now almost completely rely on the commercialised paper for village income. This has meant a "notable reduction in the agricultural productivity of the community" (Peters *et al.* 1987, 430). Should the price of the paper fall, the community would be hard pressed to meet their subsistence needs. Nietschmann

³¹ Even if a forest product is not directly commercialised the market economy has effects on forests. The commercialisation of products complementary to forest products can effect resources and management systems; such is the case in Chad, where the commercialisation of smoke-dried fish from Lake Chad for shipping to large urban areas and abroad is requiring huge amounts of firewood from the surrounding forests (Neiland and Verinumbé 1991).

(1972) found the same to be true amongst the Miskito Indians; "with the restructuring of the Miskitos' economic systems, another factor is coming into play: market economy-directed wants and means. Therefore, hunting and fishing efforts are beginning to extend beyond the peak seasonal availability of desired species and they are also coming into conflict with the scheduling of other procurement systems, particularly agriculture." (62) This can be a self-reinforcing problem; as commercialisation increases, some products may become scarce, requiring more time for gathering or collecting. This in turn takes labour away from other activities (Kumar and Hotchkiss 1988).

Monopolisation: In many cases, a commercialised industry is taken over by more powerful elites, who control not only the processing, but also exercise rights over collection as well. Such is the case of the kewda perfume industry in India, where kewda flowers are collected and processed for food additives (Dutta *et al.* 1987). Commercialisation in pastoral societies has often followed the same pattern. Larger herd owners are able to adopt commercial production strategies, such as milk marketing, while others are not (Lawry 1990). Monopolisation is self-enforcing, in that the people originally able to acquire technology are the ones who are continually able to adopt new or expensive practices. Lawry notes that private boreholes, for instance, on communal grazing land are often dug by elites who can afford this cost, and the land becomes *de facto* privatised with this addition of this investment.

Change in traditions: The bark paper makers in Mexico described by Peters *et al.* (1987) and Stephen (1991) no longer make their paper solely for ceremonial use. Now that it is commercialised, they produce for export, and as such, have found that the demand for certain sizes and styles has changed the way the community makes paper (Peters *et al.* 1987). Important social traditions among the Miskito Indians started dissolving with the introduction of a market economy for turtle products. Nietschmann writes: "In order to create surplus to sell — either in the village or to turtle companies — many kinship obligations are not being honoured with a gift of meat, thereby cutting off some families from the protein distribution system." (1972, 66) This has created both social and cultural tensions in a once closely-knit group.

Land pressures: Crocombe alleges that the commercialisation of tree produce (primarily coconuts and fruit trees) in the Pacific has resulted in high land pressures: "To purchase minimal supplies to maintain a family of five entirely from cash cropping...requires several acres of the tree crops now iriuse" The transition from subsistence to cash crops, then, is accompanied by a need for more land." (197 1)

Food security: For those people dependent on the forest for some part of their household food security, it could be that commercialisation may have some of the negative effects noticed by those who have studied the transition of subsistence agriculturists to commercial cropping³². Some consequences have included dependency on fluctuating markets; displacement of food crops with cash crops; increased labour needs for cash cropping; and changes in food intake patterns (Immink and Alarcon, 1993) Falconer and Arnold, in a 1989 FAO report, Household Food Security and Forestry, note that the nutritional quality of commercial food purchases may actually be lower than that of subsistence products. Bouis and Haddad (1990) confirm these findings³³. Falconer and Arnold further note that food security in off agricultural seasons or times of hardship comes from CPRs. Commercialisation of CPRs could then make these less accessible.

Nietschmann (1972) certainly found this to be the case among the communal fishing grounds of the Miskito Indians of Nicaragua; as green turtle meat and shells became commercialised, "market sales outside of the village have increased 1500% while consumption of turtles in the village declined by 14%" (62). The Mburi of Zaire have tried to avoid these problems by not becoming dependent on outside food sources brought by bushmeat traders. They readily fall back on hunter/gather strategies when the traders do not provide rice or cassava (Hart 1978). But even in spite of these efforts, it is clear that the Mbuti keep far less meat for themselves now that meat is commercialised. Hart found that in 85 total hunts, not only were the number of hunts followed by a traditional reciprocity exchange much lower than those involving a commercial exchange, but also that the amount of meat in a commercial exchange was twice that of a traditional exchange. The Mbuti's trading patterns has clearly left them with less meat than before (Hart 1978).

Table 3.2 Traditional versus Commercial Exchange of Bushmeat

Kind of exchange	Hunts followed by an exchange	% of total hunts	Meat exchanged (total kg)	% of total meat	kg meat per exchange
Commercial exchange	61	72%	648	39	10.6
Traditional exchange	28	33%	142.3	9	5.1

(Source: Hart 1978, 344)

— See, for example, P. Xunvcn, IT.he.nutrioual conseq rural development projects", Food and Nutrition Bulletin 4 (1982): 17-22, P. Fleuret and A. Ficurct, "Nutrition, consumption and agricultural change", Human Organisation 39 (1980):250-60.

³³ It should be noted however, that this may not be a universal phenomenon because markets can often offer more diversity of food than traditional agriculture.

Industrial commercialisation: External commercial and industrial forces may cause profound changes in local subsistence economies, particularly where state governments are encouraging the expansion of these industrial processes. Industrial and revenue interests may not have the vested interest in the preservation of forests that communities do, and for that reason alone industrial commercialisation can be detrimental, especially when the industrial project usurps traditional use rights to forests (Bradley and Dewees 1993; Hafner 1990; Messerschmidt 1986) Fernandes, Menon and Viegas (1988) note that industrial commercialisation can affect CPRs by bringing in a market economy to which forest based tribal communities may be unable to adapt. They write: "The main reason for this individualism among the tribals and the consequent state of marginalisation is the transition from a self-sufficient community economy relying on an abundance of natural resources to an individual-based commercial economy in a situation of shortages. This should be viewed within the situation of illiteracy among the forest dwellers and their lack of exposure to external forces that have invaded their area....Most are unable to translate their traditional barter system and measurements into a monetary economy. Hence they allow themselves to be overexploited" (227-228)

Overharvesting: The literature on NTFPs is rife with instances of overharvesting. It is worth noting that I have not found one instance of quantitative data on the sustainability of NTFPs, while I have listed in the references over fifty papers dealing with instances of species overexploitation. While overharvesting can certainly result from subsistence use, some authors have noted that "in general, over-harvesting is a significant factor in declining resource availability only for those products for which there is commercial demand" (Fong 1992, 52). Some examples of overharvesting directly due to commercialisation include:

Northwestern Botswana: Cunningham and Milton (1987) have followed the changes in vegetation that occurred after Peace Corps volunteers began marketing locally-made baskets in the US and Europe. A co-operative was established to buy the baskets and coordinate sales. A majority of the female population of some towns are now making baskets to sell to supplement their incomes. The authors note: "The change from subsistence to commercial exploitation of leaves of the vegetable ivory palm *Hyphaene petersiana* and of vegetable dyes for basket making has decimated palms and popular dye plants within a day's walk from the villages. Unless the use of these plant resources is controlled they will be lost and the basket industry will collapse." (386) The researchers note that stands of the palms closer to villages appeared to have 50% fewer leaves and less overall growth than stands that were more difficult to get to. Although many basket makers (81% of those interviewed) are now

complaining of difficulty obtaining the palm leaves for weaving, use rules have not developed for access to the palms. This has led to friction between the villages with access to the open resource.

Otomi, Mexico: In the 1960s, bark paper paintings began to be commercialised for the export market, and today represent one of the most successful types of folk art in Mexico (Peters *et al.* 1987; Stephen 1991). However, Peters *et al.* chronicle that, "the drastic increase in the demand for bark paper in the last 20 years has had a marked effect on several aspects of the paper-making process in San Pablito. In response to an ever-increasing need for raw material, the Otomi have been forced to substitute new types of bark in place of traditionally favoured species and to intensify greatly their exploitation of local forests." (425) Even substituting other local trees did not work; the substitute trees did not regenerate their bark and were therefore subject to overexploitation as well. Bark now has to be shipped in from other communities for paper making (Peters *et al.* 1987).

3.4 Summary

Commercialisation of forest products is a complicated and difficult enterprise with many pitfalls. Pendleton, rather harshly but truthfully, sums up: "Historically, strong and sustained demand for NTFPs has led to cultivation and domestication (rubber, cacao, coffee, palm oil, cashews, bananas), depletion of wild resources (rattan, fruits, orchids), or synthetic substitution (rubber, palm oils, vanilla, maple)." (1992, 254) Because of these factors, marketing needs to be undertaken carefully and systematically in areas where it is not already operating, and for currently non-marketed products.

Commercialisation can have rapid and drastic changes on rural economies ill-equipped to deal with it. The point that seems to be universal in the examples cited in this chapter is that communities who seem best able to adapt to commercialisation are either those with flexibility in determining whether to participate, which allows control over the degree of change (such as the Mbuti and Stephen's craft producers who are able to control how much commercialisation occurs; compare with Case Study Four and Five where communities had no control over whether or how extensively to participate) or are those in which change has been less rapid (Moreno-Black and Price's Thai traders and Goldsmith's miraa traders: Compare with Peluso 1992a where rapid change from outside contributed to CPR breakdown of use rules" dverTronwood;and" — with Peters' *et al.* bark paper makers where change happened in the space of a few years (1987)). Other factors are certainly important, but appear to be less universal

than degrees of change and rapidity of change. For example, it does not appear that having a historical background in commercial trade (such as the gum arabic producers) produces any advantages over newly commercialised (formerly subsistence like the Mbuti) communities in most cases.

This leads to the conclusion then that it is probably the intensity of commercialisation (Berkes 1989b) that will likely effect CPRs, not simply the existence of commercialisation itself. Intensity appears then, if we take the case studies cited in this report to be fairly representative of a wide range of circumstances, to be a function of the degree of change (little change or much change) and the time in which change happens (gradually or quickly). These two factors then can be multiplied by less universal and more specific socio-economic issues affecting each CPR, such as the type of resource, the product itself, the type of users, the internal socio-economic pressure and external socio-economic pressure, the history of the CPR and the type of institutions governing it. If we wanted to express this as a function, it would look like this:

$$x = f [d t (R + P + U + I + E + H + G)] , \text{ where:}$$

x= intensity of commercialisation
d= degree of change
t= time in change
R= resource factors
P= product factors

U= user factors
I= internal pressure factors
E= external pressure factors
H= history of CPR
G= governance factors

These factors are not all equal in weight, of course; that is, poor governance will not be 'cancelled out' by the fact that a product is abundant. The above formula should be used for qualitative understanding of interactions, not as a quantitative commercialisation index yielding a specific prediction. The next chapter will focus on how these variables, like 'resource factors' or 'user factors', might be defined in CPR-specific situations. Defining these variables will help us develop appropriate tools for analysing a variety of CPR and commercialisation experiences.

IV. EFFECTS ON CPRS FROM COMMERCIALISATION

"Until indigenous peoples obtain recognition of their inalienable rights to their territories, any form of survival will remain precarious, and the production of surplus commodities will be unstable because of the threat of invasion, deforestation, and resource depletion. Thus, to discuss marketing without discussing the control of the resources which will provide that market with goods is an inversion of sound economics"

-- A. Gray, 'Indigenous People and the Marketing of the Rainforest', 1992.

This chapter will look at how a CPR and its users might cope (or not) with commercialisation, and how the interactions between socio-economic variables in a CPR might produce high or low intensities of use. **Appendix One**, with the five CPR case studies, shows how different CPRs consisting of different user groups and resource bases have succeeded or failed at managing a resource that has been commercialised. Case Studies One and Three are qualified successes with room for improvement. Case Study Two is a partial failure with potential to get better; Case Study Four was a failure devolving into open access, and Study Five is virtually anarchy in an open access situation. This chapter looks **at** the reasons for these results, **as well as** exploring other CPR situations. The previous chapter dealt with generalised trends in commercialisation, so this chapter seeks **to** find if those generalisations hold true **for** CPRs, and if so, in what circumstances.

4.1 Benefits to CPRs from Commercialisation

Based on the case studies in **Appendix One**, **as well as** knowledge about commercialisation in general, we can understand ways in which commercialisation might be beneficial to CPRs. The main reason appears **to** be:

Value creates incentives for CPR: Wade (1986) finds that village-wide institutions for CPR governance are "only likely to be formed when the risks of loss are relatively high... That is, the relationship between risk and social response seems to be an almost sufficient one." (252). Since success requires high productivity and high returns, commercialisation can often provide reasons and incentives to strengthen communal action, or to start a CPR where one did not exist before. For example, in the Philippines, traditional village jural rules have encouraged private land holding. Yet~ because the introduction of commercial products into the area has "required large landholdings, stripping machines, labourers and livestock, nuclear families pool their

capital and land. Consolidation of capital, labour and resources is done through male siblings. With new economic demands, the emphasis on neo-locality has also changed." (Yengoyan 1971)

Peluso has found that commercial fruits create strong incentives for community management of forests in West Kalimantan. The high value of durian fruits has created an reason for creating and protecting forest "orchards" of the durian trees. These trees are often planted and protected on village lands, and use rules are governed by complex and changing tenure patterns. Peluso writes: "A local 'ethic of access' to certain types of land and trees has tempered the potentially harsh aspects of privatisation and commercialisation taking place." (1994, 2) This ethic of access - "a historically grounded set of meanings which indicate the relative importance of particular resources" (Peluso 1994, 34) often mediates incentives and use rule structures within commonly owned lands by assigning historical and social values to the trees and their products. Research such as Peluso's seems to indicate, then, that high value items (i.e. those with commercial or social value) can be protected under CPR situations if the cost of losing them is high (Barbier et al 1989; Netting 1982 in McCay and Acheson 1987a). The evidence for this can be seen in Case Studies One and Three, where a commercialised product came first, and a CPR came after; in other words, the value of the product created a need for a CPR. (See also Stewart 1991 on situations where resource scarcity created incentives for protection.)

Reduced encroachment or overuse: Assigning a high value to CPR products can also prevent competing land uses from encroaching. Jodha's (1990) work in India indicated that many CPRs were ploughed over because they were seen as more profitable under agriculture. Having valued commercial products from CPRs could prevent some types of encroachment. High value commodities can also in some circumstances prevent overuse. That is, less of a product is needed to fulfil income needs if the product is worth more. A Bolivian tribal group producing cloth from palm fibres was able to scale back production and lessen pressure on its resource when a co-operative was formed to procure higher prices for the fabric (Rioja 1992).

4.2 Problems in CPRs Due to Commercialisation

Unfortunately, despite these benefits, commercialisation creates problems with regard to the two main characteristics defining CPRs: jointness and excludability. That is, subtractability is more significant if more users are attracted due to commercialisation. This increased value attracts outsiders as well, so therefore

exclusion can become more difficult (Little and Brokensha 1987). We shall look then at each possible institutional problem associated with commercialisation of CPRs.

Disputes: Disputes can occur between insiders over use of a resource, or among insiders and outsiders over controls³⁴. Bradley and Dewees (1993) note that in some communal lands in Zimbabwe, outsiders are raiding the diminishing stock of local medicinal plants for sale in urban markets. Another product, the mopane worm (*Gonimbrasia belina*), found on *Colophospermum mopane* trees, is causing disputes. These caterpillars are consumed in large quantities in rural Zimbabwe, but they also have a large commercial urban market. It is currently thought that their numbers are progressively declining, and their value is so high that the right to harvest at favoured sites is often the cause of disputes. These worms are highly commercialised and can fetch prices equivalent to fresh beef on the open market. Bradley and Dewees (1993) believe that the most serious situations have occurred where harvesting rights have been granted to outsiders -- primarily by the government's district councils, who have much control over communal lands, often overriding individual villages' rights — and the outsiders then transport the worms to urban markets, siphoning off money and the resource itself from the local people. "Such concessions have been strongly protested by local people, who regard this product as part of their common property heritage. Disputes of this nature have even been reported in the national press." (81) Bruce *et al.* (1993) believe that insider disputes over commercial resources can most likely be resolved through the traditional dispute resolution mechanisms governing CPRs, but that disputes involving outsiders are much more troubling. Because enforcement is such a significant problem in these cases, Bruce *et al.* and Rose (1992) believe that with regard to outsiders, CPRs should look to other sources, such as the state, to help regulate and enforce these disputes. [Disputes also arise occur over things other than the commercialised product itself. Conflict can often be over land. In Zaire, the commercialisation of bushmeat is resulting in overharvesting, leading to the need for wider hunting CPRs. This has resulted in some intra-band conflicts (Hart 1978, 341).]

Privatisation: Commercialisation can fundamentally change the transaction costs of defining and enforcing property rights. Formerly low-value land, which was easy to keep in common ownership, may suddenly have a higher, cash value. And this cash value may make the transaction costs of privatising land (see Runge 1986) worthwhile. As Pinedo-Vasquez *et al.* note (1990), it is often the elites who are able to usurp valuable CPR land for their own use. Commercialisation gives the elites more of an incentive to do this. For example, credit for commercial enterprises is often tied to" land ~

ownership. Should members of a village committee dominated by elites want to start commercial enterprises, they may push privatisation in order to have credit and access security (Chalamwong and Feder 1986; Kemp 1981).

Additionally, when CPR land is privatised, it is these elites who often receive the lion's share of land. Jodha's work on CPRs in India indicate that when former CPR land is privatised, the poor received a much lower percentage per person of the land.

Table 4.1 Distribution of Privatised CPR Land in India

State	Total Land Given (ha)	Total Households	% of Poor in Total Land Given	% Land Proportion to Poor	Per Household Land Received by		Average Land Size after receiving land	
					Poor	Others	Poor	Others
Andhra Pradesh	493	401	50	74	1.0	2.1	1.6	5.0
Gujarat	287	166	20	45	1.0	2.6	1.8	9.4
Karnataka	362	203	43	65	1.3	3.0	2.2	8.0
Madhya Pradesh	358	204	42	62	1.2	3.2	2.5	9.5
Maharashtra	316	227	38	53	1.1	1.9	2.0	6.2
Rajasthan	635	426	22	36	1.2	3.2	1.9	7.2
Tamil Nadu	447	272	49	66	1.0	1.5	1.9	6.7

(Source: Jodha 1990, A-71)

It is not only the poor who lose out when CPR land is privatised. Women can be seriously affected in countries where women are not allowed to hold private land (Wickramasinghe 1992). This point is especially relevant given the work of Fernandes and Menon (1987) and Fernandes, Menon, and Viegas (1988) which has demonstrated poorer women's strong dependence on common property for income and food.

Encroachment: As noted earlier, higher value products may likely attract outsiders to CPRs. As Arnold (1994) notes, "there are also numerous instances where use or harvesting rights to particular products on private land -- for example fuelwood and post-harvest grazing - are withdrawn once those products acquire significant market value." (19) Weinstock (1983) has found that the high rattan prices of the early 80s in Indonesia led to a huge upsurge in the amount of rattan being traded, due to the increased efforts of outsiders moving into forested areas³⁻¹⁵.

Makuku (1993) notes a novel way to discourage state and outsider encroachment. Village heads make generous donations of the harvested forest product to others, which reinforces the idea of the authority of traditional management to outside interests and engenders support for the system.

Even if outsiders do not encroach and appropriate a valuable CPR resource, the state often does (Castro 1991). Fernandes, Menon and Viegas (1988) quote a government of India report that justified state appropriation of commercial NTFPs by stating: "Free supply of forest products to the rural population and their rights and privileges have brought destruction to the forests and so it is necessary to reverse the process. The rural people have not contributed much towards the maintenance or regeneration of the forests. Having overexploited the resources, they cannot in all fairness expect that somebody else will take the trouble of providing them with forest produce free of charge" (10) Bruce *et al.* (1993) mention a similar problem in Zimbabwe: appropriation by District Councils, which are supposed to oversee communal lands for the benefit of the local people. Instead the councils often appropriate commercially valuable tree species to fund unrelated district projects. This is by no means uncommon. In India, sandalwood and bamboo are no longer considered common property because the state finds them valuable in commercial markets (Blakie *et al.* 1986, 494). Fernandes, Menon and Viegas (1988) confirm that the Indian Forest Service often usurps traditional CPR products with value mainly because these NTFPs make up a significant proportion of the Service's operating budget., Blakie *et al.* (1986) note that "most minor forest products have ceased to be CPRs either because they have been overused to the point of extinction or because they have been commercialised and taken out of the realm of CPRs for local use" (1986, 498).

Dependence on outside institutions: To create a market where one has not existed before — or has not existed as intensively -- is to necessarily orient production towards someone else's needs. A market creates dependency by virtue of its existence. Many economic anthropologists have long noted this and its effect on traditional societies. More recent studies of contact with indigenous societies have revealed that these levels of dependence on markets -- and thereby foreign goods and customs -- often contribute to the breakdown of communal management structures. Saffinol and Hames maintain: "The introduction of non-locally produced goods into Yanomama society has disrupted village life. Traditional items were in general widely shared since they were plentiful and could easily be replaced or repaired. However, whether a Western good is shared depends on whether or not it is scarce, easily lost, ruined or expended." (1983, 23) Dependence on markets also causes changes in traditional agricultural economies, by focusing production on a few commercial products — such as the green turtle in Miskito culture of Nicaragua -- to the exclusion of independence from market commodities. The cycle of acquiring cash to buy commercial commodities instead of producing them communally is difficult to break (Nietschmann 1972). [See also Case Study Four.] However, this type of dependence on commercial products can be avoided, notes Gray

(1990), mainly by one of three means: "control over the processing of products before they go to the market; control over the transportation of commodities to market; [and] the use of their own contacts through their national and international organisations to gain market outlets." (Gray 1990, 226)

State interference : States, when they are not outright usurpers of commercial CPR products, often seek the 'regulation' of products, either for state money-making purposes, or because the state does not believe communities can adequately manage commercial products on their own. This can result in weakening of communal institutions. In Indonesia, customary rights to use forest resources are recognised by state law. However, those laws are ignored when it comes to villagers who harvest for commercial purposes. In these cases, the government claims the right to 'manage' the resource through permits and regulations (Peluso 1992a). This has resulted in overlapping tenurial niches and breakdown of traditional management.

Regulation of minor forest products by the Indian Forest Department — undertaken to guarantee a steady supply to producers - has instead backfired by disrupting the trade by making it of an open access nature, and which has harmed the collectors as well (Arnold and Stewart 1991.) In a similar vein, the state may try to impose state collection or marketing cooperation schemes on the commercialised product in order to procure a middleman's profit (Fernandes, Menon and Viegas 1988). In Pakistan, medicinal plants have recently become attractive cash commodities. The state now regulates their use on 'state' forests - formerly open access or CPRs (Regional Office for Asia and the Pacific, FAO, 1987). The state may also seek to domesticate and create plantations of valuable NTFPs for their own use (Indurkar 1992)

Gender balance: As seen in Chapter Four, women often have a major role in marketing subsistence products. But if these products, many of which are collected from communal areas (see Fernandes, Menon and Viegas 1988), acquire a large cash value, the women's roles in marketing and money control may be usurped by men (Fortmann 1991; Horowitz and Jowker 1992; Arnold 1994).

Overharvesting: The most consistent problem with commercialisation of CPR resources seems to be overharvesting (although this is not a phenomenon exclusive to CPRs by any means). Rules for use set up to be effective for regulating subsistence use are often inadequate in dealing with the intensity of use that commercialisation can present. In many cases overharvesting may also be a result of either the absence of property rights in the first place, or the breakdown of former CPR management, both

resulting in open access and the true 'tragedy of the commons'. Yet overharvesting can take place within a regulated CPR as well, often due to lack of information or lack of enforcement. Examples of degraded common property resources include: Brazilian native reserves (Hinojosa 1992); Mexican communal agricultural fields (Wilson and Thompson 1993); the Miskitos of Nicaragua, described in Ch. 4; the Mbuti in Zaire, described in Ch. 4; Fernandes, Menon and Viegas's (1988) work on tribal CPRs in India. Additionally, all the Case Studies in Appendix **One** demonstrates the power of commercialisation in promoting some degree of resource depletion.

It is nearly impossible to isolate the exact cause of institutional or resource breakdown. Breakdown, as mentioned in the summary of Chapter 3, is a function of all these problems associated with commercialisation. But can these problems be countered? And if so, how?

4.3 Keys to Success in Coping with Commercial Products in CPRs

There are many socio-economic, political and historical factors that may help explain how CPRs cope with commercialisation. Some examples (though they may not be *universally* true) include:

Lack of colonial interference in past: Stephen (1991) has noted this in regards to the bark painters of Mexico, where all land has always been seen as communal, and where the state has not tried to regulate commercial use of communal land. Lack of colonial interference in trade has made some CPRs stronger - as in several Pacific states (Crocombe 1971) — while excessive colonial control plagues some CPRs to this day (i.e. wildlife is still controlled by the state in sub-Saharan Africa - a vestige of colonial government that has been slow to change (Murphree 1991)). [See Case Study Two.]

History of commercial production: Stephen (1991) notes that a history of exchange allows groups to take advantage of existing regional markets and networks, and thereby allows CPRs to take control of commercial situations. Historical experience in marketing may also have aided CPRs in adjusting to the very long and large fluctuations in annual production common to extractive forest-based activities (Stewart, pers. comm. 1994). Bunker disagrees. He believes that historical commercial trade has created a type of dependency that CPRs are unlikely to be able to change:

Subordination to world trade systems over 350 years has increasingly compelled indigenous and peasant societies of the Amazon to abandon ecologically balanced subsistence strategies based on a wide range of available energy sources for ecologically destructive concentration of a much narrower range of commodities demanded by external markets... Since 1960, market pressures, together with government

sponsored credit and fiscal incentive programs, have accelerated this process. (Bunker 1980)

We are basically unsure as to the role that historically commercialised products play in CPRs. Some have speculated that newly commercialised products are those most likely to harm collective management, particularly because of the quick pace and dramatic highs and lows of commercial changes (Cunningham 1987; Peters *et al.* 1987). Others, like Berkes (1989b) and Larson and Bromley (1991), disagree, believing that even products such as fur and gum arabic, respectively, which have a history of commercial exploitation, can prove trying for CPRs. This is obviously an area requiring more research, although Jodha (1990) provides some quantitative evidence that in India at least, lower degrees of historical commercialisation may be associated with lesser erosion of social sanctions and stronger CPR management.

Table 4.2 Commercialisation and Erosion of CPRs in India

Demographic Characteristics	Villages Covered (#)	Decline in Area of CPRs (%)
Degree of Commercialisation ¹ :		
Higher	31	44%
Lower	28	18%

1. Degree of commercialisation was broadly defined as those villages with market centres within 2km; availability of more than 5 shops in the village; regular operation of a village trader; year round bus service; etc. On the absence or presence of these attributes higher and lower degree of commercialisation were defined.

(Source: Jodha 1990, p A-73)

Strong group cohesion: Stephen (1991) explains that traditional exchange, ritual and political institutions have been upheld and even enriched by export of crafts, as long as they were strong to begin with, and supported by the community as a whole. The maintenance of these social traditions has allowed a continuity of relations in a community which are "outside the direct influence of the state or private businesses" (116) and provide a buffer against the negative effects of commercialisation. Hart notes the same for the Mbuti in Zaire (1978). Strong social cohesion need not always be cultural oriented or kin-based (see Goldsmith 1988), although it appears that this is usually the case.

Makuku (1993) found that harvesting of harurwa (forest insects) in rural Zimbabwe was regulated successfully because it was done communally and the collection was combined with social ritual traditions. Harurwa is both a subsistence and a commercial product — the insect is used for relish in home cooking, and a single family can earn \$50 a season from harvesting harurwa commercially. The community

follows the same harvesting procedure each year: a ceremony is organised when the insects start to become plentiful. At the ceremony, the chief will select a harvesting head (a high honour) for the season who ensures collection is done orderly and equitably. A camp is set up in the forest and collectors must report to the camp where they receive proper harvesting instructions. Enforcement of rules is through rotational village caretakers. Harurwa harvesting has not only been successful in keeping the insect population high, but provides an incentive to preserve the community woodland intact where the insects breed and live. The significant tie between community ceremonies and cultural myth about harurwa has given harvesting and management practices strong village support (Makuku 1993,21).

Small homogenous population of users: Jodha (1990) notes that lower socio-economic differentiation, which ensured equity of access and benefits from even commercialised CPRs, helped prevent some resource encroachment/privatisation in his study villages in India. Chandrakanth (pers. comm. 1994) has found thus far in his preliminary work on India's sacred groves that those villages with common caste or cultural backgrounds - regardless of the degree of modernisation — generally have groves that are much better preserved than those of heterogeneous or transmigrant populations.

Distribution of benefits well-defined: If users are happy with the distribution of benefits from common property, they are more likely to contribute to its management. As Lawry (1989) points out, collective action is more likely to result when the common resource is critical to local incomes (and scarce), and that collective action will be more difficult to achieve where "interest in the resource as a source of income varies or where resource use strategies differ significantly." (9) Ballabh and Singh (1988) found that perceptions of fairness as related to benefit distribution systems contributed to CPR success in parts of India. As benefit distribution may be closely linked to social customs such as sharing or reciprocity, the strength of historical trends such as these may determine the management of benefits (Hart 1978; Makuku 1993). Quick distribution of benefits seems to be one key to success (Case Studies Two and Three; Arnold and Stewart 1991). Particularly important is if everyone feels they get personal benefits (especially cash); Makuku (1993) found that because individual households got to harvest and sell *harurwa* (insects) themselves, subject to limits and regulations, each person contributed to the enforcement and management of the forest (see also Fernades, Menon and Viegas 1987). This is not surprising -- harvesting in the name of the community for community projects, for example, allows many people to free-ride -- on the community project without contributing to it (see Gibson and Marks 1994). The individualising of harvests can actually communalise enforcement and participation in

many cases because an individual benefit provides an added incentive to be cooperative (See Case Study Two). Stewart (1991) further notes reasons for the success of the benefit distribution situation in the Aga Khan Rural Support Program in Gujarat India, where common land was used for commercial fodder:

The benefits from the intensive fodder production ... were substantial and allocated by selling the right to hand harvest grass or purchase bundles of grass cut by the farms. This approach was proportionately more favourable to households who did not have their own sources of grown fodder crop of agricultural residues. Managerially simpler systems of annual leases to relatively larger tracts of the fodder producing areas was attempted [but] ... the benefits were cornered by relatively better off households as there were few bidders for expensive yet difficult to estimate future production. The specific rules developed in each externally catalysed project vary tremendously. Even within one site, rules have often changed from year to year and even within one year. ... In comparison, the ability to alter distributional rules for efficiency and equity gains is rare in most government projects where the benefit distribution rules are fixed at the national or state capital and are difficult to change by participants themselves even if they are not working. (38)

Fernades, Menon and Viegas (1988), however, write of an unsuccessful benefit distribution system in India:

"One notices that scarcity has also led to changes in the traditional distribution pattern for forest produce that was governed by cooperation. As we have seen earlier, rules governing collection of produce ensured a more or less equitable distribution of forest produce. Today, competition has to a great extent replaced cooperation, and in this process the poor and the powerless always lose out. For instance, the rules governing the picking of mahua flowers ensured equitable distribution among all. Today, the weaker sections have become more dependent on these flowers than in the past while the upper classes view them as a source of profit. Consequently, there is competition among the various classes for them and as a result the poor are denied access to them" (172-173)

Use rules appropriate: See Appendix Two on use rules for community level examples of regulations; each case chosen has examples of use rules that apply to commercial products, such as closed harvest seasons or permit requirements. When specific use rules on commercialisation are not adopted, other rules may not be adequate in defending management practices. As an example, sacred controls such as the role of taboos in regulating subsistence use is well known (e.g. Ross 1978; Davies and Richards 1991); however it is less known whether selling a taboo animal has the same connotations as eating it. If it does not, then sacred controls will be unlikely to control commercial use as effectively as they have controlled subsistence use. As noted before; pragmatic-and emergent controls (see Ch. 2). are the most likely to be successful in dealing with commercialised products.

Lack of competition for resource: While the very idea of a free market is one of competition, those societies where inter and intra-village competition is low have tended to have more success in common property management in a market economy. Gadgil and Iyer (1989) cite India, where castes in society tended to have specialised occupations. One village would grow vegetables, one would fish, one would consist of artisans and another only of priests. In this way, competition was low between closely situated villages. Even when two close villages did the same task -- for example, basket making -- Gadgil and Iyer found that often the villages would use two different resources. One village might use cypress and another corypha palm. In this way, commercialisation of these resources would most likely not create intra-village conflict or outsider encroachment (in contrast, cf. Jessup and Peluso 1986).

Problem in past: If a resource has been degraded in the past, its value may be more apparent, and the need for management may be more acute. A past problem may create its own future solution, as was the case in Cocamilla, Peru, where commercialisation of fish for an urban market led to overharvesting. Once it was discovered that overharvesting was harming subsistence needs of the village, commercial fishing was banned and the whole village joined in to enforce the rule (Stocks 1987).

Flexibility in adapting to commercialisation: Quiggin (1993) argues that although it may often seem as if "common property systems are essentially incompatible with modern capitalism," flexible arrangements that allow for individual choices as well as group control may help counteract some of the destructive forces of the market (see also Stewart 1991). For instance, letting some products be used for personal commercial gain while others are strictly for the community (see use rules in Appendix Two) could be one type of a successful flexible rule. Flexibility can also apply to how and what products are available for the market. Having more than one product allows for flexibility when markets are unstable; "this, in turn, enables politically and economically marginal farmers to participate in the market economy to a remarkable extent on their own terms as opposed to the market's, thereby avoiding many of the risks that the latter entails" (Dove 1993 145)

Resource base appropriate: Commercialisation is inappropriate in high species diversity forests for reasons of economic efficiency (Salafsky *et al.* 1993), nor is it likely to be appropriate in non-colonised forests lacking in infrastructure (Pendleton 1992; Peluso 1992a). Netting, referring to Swiss villagers, found several resource attributes that seemed to contribute to "CPR success that have-proven to be-true in other areas of the world (see Perez-Crespo 1991).

Table 4.3 Resource Attributes Contributing to CPR Success.

Attributes of Land Use	Communal tenure	Individual tenure
Value of production per unit area	Low	High
Frequency and dependability of use	Low	High
Possibility of improvement/intensification	Low	High
Area required for effective use	Large	Small
Labour and capital investing groups	Large	Small

Source: (Netting 1976 in Ostrom 1987)

Some of the factors that cause CPR breakdown are also enlightening:

Transaction costs too high: The costs of joining together to prevent losing or relinquishing open access are often too high (Runge 1986; Jessup and Peluso 1986) or else take too long to organise. Free riders often require much energy to dissuade; the incentives may be too low for people to make the effort to stop free riding by others (Wilson and Thompson 1993).

Economic focus has shifted outside the community: Off-farm or village employment may contribute more to a family's income than CPR goods. This reduces the incentive or stimulus to participate in community decisions (Lawry 1990). As Wilson and Thompson (1993) note of communal ejidos in Mexico "The central economic focus of some ejidatarios is outside of the community.... This external focus may weaken the sense of community, make ejido-based grazing plans insignificant economically, and discourage the formation of compensating coalitions" (314)

Limited technical understanding: Lack of information is not just limited to villagers. Researchers rarely have conducted comprehensive studies on levels of sustainability of commercial forest product extraction. Without such information, it is difficult to set accurate use rules. This requires that the rules either be flexible or change frequently or be conservative in the first place (Wilson and Thompson 1993; Stewart 1991).

High cash needs: New needs for cash have arisen in recent years, whether to pay for school fees or to buy subsistence goods. The large taxes, payable in cash, that the government of Mali extracts have been a serious reason for the decline in common-property resource management in rural areas because cash-making opportunities from the CPRs are sought by villagers (Moorhead 1989).

Let us return for a moment to our function of Chapter 4r which we said could help determine the intensity of commercialisation, and expand and assign possible

positive or negative values to some of our variables. Again, this is not a quantitative measurement, but a tool for understanding. Our function was:

$$x = f [d t (R + P + U + I + E + H + G)] , \text{ where:}$$

x= intensity of commercialisation
d= degree of change
t= time of change
R= resource factors
P= product factors

U= user factors
I= internal pressure factors
E= external pressure factors
H= history of CPR
G= governance factors

Based on what we have seen in the case studies, other examples of commercialised CPRs, and CPRs generally, we can assign general positive or negative values to attributes in each of the different variables. Plus means only that the attribute generally creates positive or successful commercialised CPR situations, while negative means that this attribute has been indicted in some cases of CPR failure or difficulty.

Table 4.4 Types of Positive and Negative Variables in CPR Commercialisation

R= RESOURCE FACTORS

Positive Attribute	Negative Attribute
Stock resource	Flow resource
High species density	High species diversity
Many products available	Few products available
Few other land pressures	Many other land pressures
Low to moderate value resource	Very high value resource
Little subtractability in use	High subtractability in use
Enforceable boundaries	Diffuse boundaries
Little technical knowledge needed	High technical knowledge needed
Sustainability easy to achieve	Sustainability difficult to achieve

P= PRODUCT FACTORS:

Positive Attribute	Negative Attribute
Marketed locally	Marketed internationally
Staple item	Luxury or inferior good
Few substitutes	High substitutability
Also used for subsistence	Only for market
Steady demand	Fluctuating demand
Marketed by cooperative	No cooperative
Diversification in products	Reliance on few products
Linkage to local enterprises	No local uses or needs
Needs to be produced in scale	Scale of economy not important
Niche for product	Competitive with many products

U= USER FACTORS:

Positive Attribute	Negative Attribute
Many users willing to help manage	Few users willing to help manage
Homogeneous group	Heterogeneous group
Smaller user group	Larger user group
Users are also owners	Users are only users
Product tied to community ritual	Product has no social relevance

I= INTERNAL PRESSURE FACTORS:

Positive Attribute	Negative Attribute
Population growth low	Population growth high
Little out-migration	High out-migration
Cultural traditions strong	Cultural traditions weak
Equality in community	Dominated by elites

E= EXTERNAL PRESSURE SITUATIONS:

Positive Attribute	Negative Attribute
Low in-migration	High in-migration
Modernisation slow	High/fast modernisation (i.e tractors)
Low industrial pressures	High industrial pressures
Economic focus in community	Economic focus shifted elsewhere
State encourages decentralisation	State retains centralised control
State does not need \$ from forest	State needs \$ from forest
Other communities respect laws	Other communities challenge laws
Outsiders easy to exclude	Outsiders difficult to exclude

H= HISTORY OF CPR:

Positive Attribute	Negative Attribute
Stable CPR over time	CPR is new or encroached upon
Problem in past with a solution	Problem in past with no solution
Little colonialist influence	High colonialist influence

G= GOVERNANCE FACTORS:

Positive Attribute	Negative Attribute
Older legitimate institution	New institution
High level of social/moral control	Low moral/social control
Flexible pragmatic controls	Inflexible pragmatic controls
Quick ability for emergent controls	No creation of emergent controls
Local elections for institution	Imposed elections for institution
Dispute resolution mechanisms	No dispute resolution mechanisms
Simple rules in benefit distribution	No rules for benefit distribution
Individualised benefits	Group benefits
Quick cash benefits	Slow intangible benefits
Clear definitions of users	No definitions of users
Enforcement by locals in groups	Enforcement by none or few
Transaction costs of institution low	Transaction cost of institution high

In sum, we could rephrase our original analytical model questions from Chapter 2, which applied only to general cases of CPRs. In order to analyse the success or failure of forest-based CPRs facing commercial pressures we most likely need to know the following:

Table 4.5 Re-evaluation of CPR framework for Commercialisation

<p><u>The Resource:</u></p> <ul style="list-style-type: none"> • size and boundary conditions of the resource (large tropical forest or small village woodlot) • the physical condition of the resource (degraded or rich in produce) • the ease with which it can be harvested by several or many users (distribution spatially or temporally) • its appropriateness for management communally rather than by individuals (wild crops vs. cash crops) • intensity of harvesting in time and space • history of exploitation of resource, including problems in past • the role of technology in harvesting and processing • type of produce available (staple, luxury, inferior) • the availability, type and stability of markets for its outputs • the competing uses for the resource base • the vulnerability of resource to overharvesting • information accessibility about sustainable harvesting <p><u>Decision-making arrangements</u></p> <ul style="list-style-type: none"> • collective and constitutional choice mechanisms: procedures to set and change operational rules over who may use the resources' products; flexibility, expediency and simplicity of changes in rules • operational rules: who has access to the products, when and how they may use the products, what information must be shared about the products, limits on excessive or commercial use, ways and means for obtaining compliance with use rules. Flexibility and simplicity of rules. Types and degrees of incentives for participation. • history or experience in commercial use rule setting. • role of external legislation and regulations on harvesting and marketing, and of enforcement • role of external bodies in supporting or usurping rights to harvest • type of external uses by outsiders that are allowable or not <p><u>Structure of the operational action situation</u></p> <ul style="list-style-type: none"> • number of harvesters, and amount of harvesting done per user • dependence of users on the resource, for both subsistence and cash • patterns of reciprocity and non-reciprocity governing resource benefit distribution, especially non-kin • degree of homogeneity in terms of assets and benefits, information about the resource, skills needed in harvesting or processing • degree of dependence on cash economy or trade goods • degree of cultural significance of harvesting or use • efficiency and equity outcomes that allow for multiple uses or users • sustainability questions addressed by rules
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In learning what constitutes a successful CPR versus an unsuccessful one, we need to ask the fundamental questions of how do we quantify success? Do we use participation rates (Chopra *et al.* 1990)? Resource protection levels (Jessup and Peluso 1986)? Benefit distribution equity and efficiency (Oakerson 1986)? Each case is different; therefore 'success' as a comparative term often needs to be qualified. _____

And 'failures', as such, do not always have to be permanent failures. Should a resource be degraded, restoration is often possible, although it takes a certain amount of time. Should a CPR institution be broken down, restoration is possible for it as well. In fact, some societies treat CPR breakdown as part of a cycle of flexible use rules. Berkes (1989b, 83) found among the Cree Indians of Canada that beaver overhunting in the 1920s and 1930s was started by outsiders and the once-communal native resource became open-access. However, once beaver became scarce, the outsiders left the area, and the Cree were able to restore many of their traditional rules once the beaver population had recovered. It took a few years, but productive regulated harvests were possible again. The resource, while a productive CPR right now, has been through several of these boom and bust cycles in the past, and may continue to do so in the future (see Case Study Four in Appendix One).

Furthermore, it is not impossible — though it is difficult — to create common property management regimes where they have not previously existed. Richards (1991) cites as an example the Mexican sawmillers of Plan Piloto Forestal who have managed to take over a former private timber concession and manage it successfully as a CPR. Stanley (1991) reports a similar case of resin tappers in Honduras.

4.4 Summary

What we have learned about CPRs affected by commercialisation bears repeating. The effect commercialisation has is a function of multiple factors relating to the resource, the user group, the type of commodity, the internal and external pressures on the CPR and the types of governance institutions. While it would be next to impossible to accurately predict what will happen in a specific CPR that is commercialised, we can draw general conclusions about CPRs. CPRs will most likely succeed in adapting to commercialisation if the intensity of commercialisation does not overwhelm the incentives for participating in the management of the resource or for cooperating with the institutions governing the resource.

This has important ramifications for outsider organisations, whether national governments or NGOs, which seek to market forest products from CPRs. Any marketing scheme must be sure to look at the resource and institutional factors that have guided the CPR over time. To ignore these factors is surely being short-sighted.

Local institutions as well would be wise to carefully think of the effects of commercialisation on a CPR, when choice is actually an option. There are many examples of communities who have chosen to commercialise (Stephen 1991; Hart

1978) and many examples of those who have chosen not to commercialise (Rioja 1992; Dennison and Thomson 1992). Regardless of the final decisions made, it is abundantly clear that it is the local community that is best equipped to make these decisions. Local people must be given a choice to decide for themselves on the best course of action. It is a lesson that national governments, development agencies, and conservation NGOs are just beginning to learn.

V. CONCLUSIONS

"The importance of land tenure cannot be overstated. Of all the variables involved in the equations of successful non-timber forestry, land tenure can be manipulated directly though public policy."

- L. Pendleton 1992, 256

Quiggin (1993) remarks that "the shift from subsistence to market production has the potential to increase both income inequality and divergence in other dimensions. The challenge is to promote patterns of development which maintain the egalitarian values inherent in common property institutions and encourage the emergence of common property systems adapted to the needs of modern and modernising societies." (1135) It is this challenge that faces many foresters and development planners — as well as traditional societies themselves -- today.

We have seen the reasons for the existence of CPRs, and the benefits they bring, particularly to women and the poor. We should not, however, mythologise the 'happy' commons as a land where indigenous strategies always result in successful, or conservation oriented, outcomes. There are many examples of traditional communal management systems that are unsuccessful (Hames 1987). The outcomes of communal management may not be sustainable at all, or if they are, they may be the result of disputes rather than a 'conservation' ethic per se (McCay and Acheson 1987a). Western ways of looking at problems, solutions and outcomes often make us perceive things that may not be so³⁶. Economists tell us that individuals will seek to maximise their economic returns from commons; anthropologists will tell us that cultural norms regulate common behaviour; and political scientists will tell us that group behaviour is based on factions and politics. In truth, all of these factors, plus more that we simply do not understand, contribute to common management (Peters 1987).

Despite all we may not understand, there still remain opportunities to learn from CPR management, with possible application to a multitude of modern day forestry problems. And, where appropriate, there is also much we can do to support CPRs in spite of, or because of, pressures of commercialisation. The two can be complementary phenomena, in spite of some of the questions I have raised in this paper. Some possible strategies for strengthening community management follow:

36 Berkes (1989b) has noted that many Native Americans believe that it is arrogant for humans to play god by manipulating animal populations for future productivity, such as tagging, selective harvesting, etc. They used their own world-view and culture, not modern conservation science, to achieve much

National Support for Strengthening CPRs: Legal legitimacy on a national level is often essential for local communities to create and enforce use rules. In some cases, laws may be in the books regarding customary rights, but they need to be enforced and defended (Land and Swift 1989). Where communities cannot do this themselves, the state may need to help³⁷. Jessup and Peluso (1986) note that traditional villages can attempt to control some of the pressures from commercialisation of CPRs. However, when the pressures are combined with other external forces, as is the case with deforestation caused by logging concessions in East Kalimantan, the state needs to help CPRs by dealing with those external forces. Lawry adds that "government action can help create the conditions for local action by clarifying disputes, and providing technical assistance to local groups attempting to intensify management." (1990, 421)

Reinstating CPR Management: Arnold (1993) notes that "when local institutions have broken down under the pressures of change, it is not to be expected that new communal institutions capable of controlling resource allocation and use can be created easily. Recent interventions to strengthen local management, or to create new collective management systems, have so far met with only limited success." However, researchers working with Javanese resettlements (Dove 1990) have noted that customs can be revived successfully for resource management. Biesele *et al.* (1992) agree. They note that thousands of Juhoansi (Bushmen in Namibia) who had either migrated to cities or been resettled, decided to voluntarily leave these unfamiliar areas, and by 1992 thirty separate new communities had been set up in old hunting/gathering areas. The re-establishment has been difficult, but appears successful thus far because people have voiced strong support for the traditional community norms of cooperation.

CPR management may need to be formed in areas where communal management has not been present in recent history. This presents further problems, but this is not impossible, as Richards (1991), Stanley (1991) and Stocks and Hartshorn (1993) have demonstrated for forestry-based CPRs in Mexico, Honduras, and Peru respectively.

Creation of Marketing and Management Co-operatives: Edwards (1993) believes that co-operatives and local level market information systems may be more suitable for managing a commercialised CPR than traditional social management is, especially in

³⁷ **State involvement is not without its difficulties. We have seen the interest states often take in usurping CPRs. Peluso and Poffenberger (1989) also note that organisational elements have always mitigated against change in forestry and present major obstacles to future forestry development projects." (333) Even if an agency is willing to relinquish control over appropriated land, as was the case in Java, the state may be quick to step in at the first sign of conflict (Peluso and Poffenberger 1989).**

areas with less competition and a recently or poorly established trade; areas where the traders and even collectors are outsiders; products with low volumes and high values; or for products which can be processed in villages and have established markets.

Lawry notes that this economic — as opposed to social or historical — cooperation may be more effective than traditional social controls in areas where CPR management has broken down (Lawry 1983). Co-operatives help solve the dual problems of market instability and resource management by allowing members to rely on each other and by providing incentives for management by reducing free-riderism (Von Braun *et al.* 1989). [However, Mayoux (1993) has noted that women are often excluded from cooperatives because they are seen as a man's realm, though women may have historically been heavily involved in marketing.]

'Shrinking' CPR Management: In the same vein, self-help or small user groups, where they are perceived as legitimate, have proven effective in taking over CPR management duties (Thomas-Slayter *et al.* 1991; Cernea 1990). These smaller, more selective groups may be more appropriate in certain situations at managing CPRs under pressure. Prantong and Thomas (1990) note:

Many communities in reserved forest areas are either relatively new settlements, or have recently experienced growth from immigration. Such villages are often characterised by more factionalisation *and less* community cohesion than older villages in long-settled areas. Various ethnic minority populations also have different approaches to social organisation. In either case, there is little reason to believe that government mandated village-level committees and organisations will necessarily have enough shared interest or mutual trust to function smoothly as units of organisation for local resource management. While there is still a feeling that village level organisation should be promoted whenever possible, smaller groups of households based on kinship or production interests, or even individual households, may sometimes be more appropriate. (182-183)

Joint Forest Management: JFM, or 'co-management', is a possibility where states do not want to relinquish all of their control over resources, or where communities need outside assistance in management. But JFM is possible only if both parties have incentives to participate. There are some notable successes. In the Philippines, the state has now issued nine 25-year communal leases to various indigenous groups for management of their forests. The leases are contingent on state rules such as: defining who has access to the forest; protecting the forests from fires/ outsiders/ etc.; and not subleasing the area (Cornista and Escueta 1990). The first license was issued in 1974 and the relative success of that project has led to other leases.

Similarly, some JFM strategies can involve single commercial products (Chopra *et al.* 1990, 119). For example, a formal, signed contract outlining rules for commercial exploitation of fuelwood and fodder with the Forest Service of Niger convinced villagers near the Guesselbodi Forest that their rights would be upheld by officials. They have since been participating enthusiastically (Minnick 1991). [For more on JFM see: Poffenberger 1989; ARD 1992a and 1992b; Djibo *et al.* 1991; and Thomson 1991 and 1994. ARD 1992a lists six broad conditions for successful JFM.]

Marketing with Smallholders: Perhaps one solution to take commercial pressure off CPRs would be through marketing schemes with private smallholders, with the result of leaving CPRs uncommercialised. Smallholders play a large role in rural economies, even where communal land is prevalent. Dove (1993), Caldicott (1988a), Padoch *et al.* (1985), Stewart (1992), Alcorn (1984), Hanover (1988), Murray (1991), Smith *et al.* (1992) and May *et al.* (1985a) all recommend increasing commercial attention to smallholders³⁸. For the case of particularly overexploited CPRs, Edwards writes that:

the promotion of cultivation on private land seems the best way forward for threatened and unmanaged populations... The alternative is common property management of wild populations, but the considerable areas over which they are collected would make access restrictions extremely difficult to enforce. Cultivation could take the pressure off collection from the wild. It could also support small-scale processing plants through control and stability of supply.

However, it should be noted that marketing with smallholders presents many of the same problems as marketing with CPRs³⁹. Perhaps because of this, rates of marketing of on-farm MPTs products are still low compared with household use (Raintree and Francisco 1994).

Further Research: May (1990b) argues that "the moment is ripe for selective intervention to promote institutional modifications and support refinement of common property management practices in use by neotropical forest dwellers. Such action should be geographically concentrated, and involve support to grassroots and

³⁸ The attention paid by these authors to smallholders does not mean they are advocating private property. On the contrary, May has written extensively about the need for CPRs (1990b; 1992). For the most part, these authors are merely suggesting smallholder productivity for the market be increased on already privatised agricultural land.

³⁹ Francisco and Mallion (1994) notice that in the Philippines, commercially oriented villages tend to grow those MPTs that are in demand on the market, regardless of land suitability or household use. Carandang (1994) found a significant difference in prices to farmer who sold at the farm gate as opposed to the market. The average price at the market is 33% higher than the farm gate, subtracting transportation costs, suggesting that farmers who transport products themselves or can organise a cooperative to do it are better off than those who must deal with traders.

intermediary organisations, government agencies, and training and research institutions that agree to collaborate toward common ends." This paper has raised a number of conceptual and practical problems with CPRs and commercialisation, many of them based on lack of information. New directions for research on both CPRs and commercialisation would be helpful in these areas.

Conclusions:

The issue of common property ownership raises many fundamental questions about societies and individuals. Hard choices are involved, as McCay and Acheson (1987a) point out:

between the need to protect and allocate access to a limited good and the sentiment that access should be open and equal to all citizens; between 'common sense' and science; between a rationality defined solely in terms of economics and one that accepts the role of the social context in determining the optimal and rational; between the need to control overcapitalisation and the commitment to full employment and equality of access. (33)

As this paper has shown, commercialisation intensifies these tensions and problems. Unfortunately for many communities, how to resolve these questions still remains unanswered.

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APPENDIX ONE -
Case Studies of CPRs with Commercial Pressures

CASE STUDY 1. Extractive Reserves in Brazil

Extractive reserves became a trendy topic in the late 80s. This was due in no small part to the national attention brought to the plight of the rubber tappers of Brazil when their leader, Chico Mendes, was assassinated. Both human rights groups and environmental conservation organisations joined forces to support the idea that rubber tappers should be given not just usufruct rights to tap, but long term leases to their own land. These leases, negotiated by the Brazilian and state governments, and held in common by a group of tappers, would be known as extractive reserves. There, it was hoped, the tappers would profit from communal management and absence of tyrannising middlemen and land owners, and great tracts of forest would be conserved as valuable rubber tapping lands. But five years into these schemes, researchers are beginning to realise that,

these reserves are not working as well as they could. Few have organised marketing co-operatives to provide economic support to their members. To survive, forest dwellers are either leaving their holdings or increasing their area of slash and burn plots.... The possibility that the extractive reserves might fail is rooted in the lack of appropriate public policies. Existing policies that directly affect the reserves are rarely enforced, and the lack of proper pricing policies for extractive commodities has left many products with no market. (L. Allegretti 1994)

What went wrong (and how it could be made right) in the case of these reserves bears repeating as other traditional groups are asked to manage lands through extractive activities (see Case Study Three on extractives in Guatemala).

Technical and Physical Attributes of the Resource:

Brazil's great tracts of land in the Amazonian states are covered with a variety of forests, from high species diversity areas to virtual monocultures of palms (May *et al.* 1985b). Rubber trees (*Hevea brasillensis*) and brazil nut trees (*Bertholletia excelsa*) are the two NTFPs in the Amazon most well known internationally, but many other

All case studies are organised according to Oakerson's (1986) framework for analysing common property resources, based on attributes of the resource, the decision making arrangements, and the operational outcomes. For the rushed reader, most of the salient points of the case studies are summarised at the end of each, and the main points are referenced through the text of the thesis.

products, such as acai (*Euterpe spp.*) and babacu (*Orbignya spp.*) enjoy a lucrative regional trade (see table 3.1 previously).

Rubber is a resource that is seemingly indivisible -- the trees are often spread very far apart and for a family to survive on rubber tapping requires several hundred hectares apiece. In one extractive reserve, Cachoeira, the population density is 1.7/km². This low density is necessary for productive extraction, since a number of rubber trees are needed per inhabitant to be economic. Families average usufruct rights over about 370 ha each, and series of quasi-private rubber trails loop through the forests from their houses (Kainer and Duyrea 1992). In actuality then, this seemingly indivisible resource in communal land in extractive reserves is actually more or less privatised among individual families as a result of the enormous size of the reserves. This leads to another problem: the isolation of the tappers in households several hours distant from one another presents serious "problems of transportation, marketing, and access to services" (Schmink 1992).

The babacu (also babassu) palm, another source of many NTFPs, is quite dissimilar to rubber. For one, it provides many more products: its husks are used as fuel; its palm heart are used as food; and its leaves are used to provide shelter. Its seeds are also the source of significant amounts of oil (May 1990b). May notes: "By the late 1970s a substantial regional vegetable oil industry had arisen to make use of babacu kernels. This generated annually \$135 million for the regional economy. It is estimated that as many as 420, 000 rural household depend on babacu for part of their incomes." (May 1990b.) [This is in comparison to a few thousand rubber tapping households.] Babacu is more easily divisible; it often grows in dense monocultures of secondary forest.

However, in both these cases, subtractability is a problem. Overlapped rubber trees will die; the babacu is often cut down to provide products like palm heart. And in both cases, excludability is a problem when huge tracts of land are involved. The borders of extractive reserves are only on paper; enforcement is impossible. At least in the case of rubber, there appears to be little pressure from outsider colonists attempting to usurp rubber trees². Babacu palm stands face their greatest threats from ranching interests who burn down the forests for cattle pastures (Anderson, May and Balick 1991; Hecht, Anderson and May 1988).

² This could be because rubber tapping is difficult, time consuming, and requires more space than the average settler has or wants.

Decision Making Arrangements:

Conditions of collective choice: Little has been written about the actual collective behaviour of residents of extractive reserves. In fact, most reserves appear to be an amalgam of quasi-private homesteads. The large tracts of land used per household cut down significantly on the ability to interact or socialise with neighbours. Additionally, rubber tappers are not a uniform population (Romanoff 1992), tend to be residentially unstable (Browder 1992b), and have few cultural or social ties with one another. Even so, Schmink (1992) notes that, "rubber tapper families are closely tied through informal kin and non-kin cooperation and show little disposition to move on to other activities. Instead, they seek to diversify their production systems and improve their productivities in order to remain as forest dwellers without undue dependence on the market for their subsistence needs." This camaraderie among disparate populations has been noticed in other heterogeneous extractive communities (Dugelby 1994a). The independence that tappers try to maintain, given their dispersed nature, has one interesting drawback, at least for conservationists. In order to avoid the market fluctuations so common with extractive products such as rubber, tappers also practice subsistence agriculture. This means that extractive reserves are hardly the forest conservation zones that some environmental groups had hoped they might become.

For rubber tappers outside of these few extractive reserves, conditions of collective choice are non-existent. Tappers rely on a patron — on whose land they tap -- who buys their rubber in return for trade goods. It is a completely unequal relationship of extreme stratification (Schwartzmann 1991). The patron system allows usufruct rights to tappers, but in return subjects them to unfair economic re-compensation cycles. (See Weinstein 1983 for a complete history of the rubber tapping system.) Food is the commodity most advanced to rubber tappers by patrons, mostly at hugely inflated prices (Romanoff 1992). In order to avoid complete dependence, agriculture is practised by the tappers. One study found that tapping only accounts for 64% of household income (Romanoff 1992).

Operational rules: As May (1990b) writes, "the Amazon frontier was originally an open-access resource: land was cleared at will, and products were harvested with no rules. However, informal rules and property rights began to develop among the peasant production groups in these open access lands. The shifting cultivators in the frontier began to claim usufruct rights over their cleared lands and fallow plots."

Usufruct rights to certain trees developed; for example babacu was allowed to remain on many farm lands and farmers had the informal right to harvest in other's fields. Furthermore, on private lands -- i.e. the large landowners' estates -- usufruct rights

were often granted to peasants for babacu product harvesting, with the condition that the harvest was sold through the landowner (exactly like the situation with rubber). Exclusion was therefore possible in both situations, as "those who are granted these rights are thus motivated to exclude others from trespassing to collect fruits or other goods from the property, hence sustaining resource productivity by reducing predatory exploitation." (May 1990b)

But these operational rights began to change as more settlers moved into the areas. Roads connected small farmers with urban markets for babacu products. Pasture expansion also reduced many lands available for babagu harvesting, as "people who trespass to gather babacu fruits in ranches are perceived as interfering with pasture management." (May 1990b)

In the case of rubber, tappers advocating the creation of extractive reserves were mainly interested in breaking the patron-client system of inequality that characterised so many extractive NTFP activities in the area (Allegretti 1992). They sought to create their own operational rules independent of the patrons. In that regard, extractives reserves are a qualified success. They have allowed tappers to sell the rubber to whom they choose and to buy trade goods from whom they choose -- to a point. The absence of roads in some areas³ has prevented true flexibility and diversity of choice in selling and trading. Lack of roads actually strengthens the patronage system because closer villages have a choice of buyers and sellers and other occupations (Romanoff 1992). The lack of attention paid to organising marketing cooperatives has left some tappers with few opportunities for marketing or reducing transportation costs, and has created a situation where tappers need to practice subsistence agriculture or other collecting activities to survive.

External Arrangements: The Brazilian Ministry of Agrarian Reform participated in the granting of long-term usufruct rights to forest resources which the tappers are to collectively manage (Schwartzmann, 1992). To date, only four out of 14 planned reserves -- encompassing a total area of more than 2.5 million hectares -- have been established. (Anderson and Ioris, 1992).

The state has long been involved in land matters in Amazonia. Individual states would issue land titles to whomever applied. At the turn of the century, many Brazil

³ Conservation groups have tried to avoid putting roads in extractive reserves because roads usually bring new colonising settlers who practice slash and burn. But if NTFP activities are to be successful, access to markets is essential. See Amadi 1993 for a similar conflict over roads in Cameroon.

nut buyers bought up state titles to control access to the trees. Interestingly enough, as few other land titles were bought, the Brazil nut stands were some of the only titled lands up until recently. As result, when banks required land titles as credit for cattle ranching schemes, the Brazil nut stands were some of the first lands to be converted to pasture. Owners of the stands were often eager to sell because they were losing their control over collectors as roads and markets for the products increased. Bunker writes of the situation:

It would appear then, that, in the case here considered, even though peasants had well established connections to markets, thought their expulsion from their land directly prejudiced the economies of a powerful local commercial elite, and though the drastic reduction of castanhais [brazil nut stands] undermines stated government export-promotion policies, none of these factors have been sufficiently potent to counter the economic and political advantages which cattle-raising offer for the capital-concentrating strategies of individual members of an increasingly powerful local entrepreneurial class. (Bunker 1980)

Additionally, because rubber and brazil nuts are international commodities, they are subject to external valuation. The boom and bust cycle that has characterised these extractive commodities (Padoch and De Jong 1988; Weinstein 1983) can be seen in Table 1. For instance, Brazil nuts were worth half as much in 1986 as they were in 1982, and palm hearts tripled their price between 1974 and 1978, but began to lose value in 1986.

Table 1. Production of Some Extractive Products in the Amazon

	1974		1978		1982		1986	
	Quantity (tons)	Value US\$1000						
Rubber	18,001	17,703	20,795	23,585	25,813	51,609	26,880	27,485
Sorva Gum	3,787	1,338	5,555	2,373	5,461	3,202	3,003	1,160
Buriti Fibre	-	-	-	-	862	115	893	83
Babaçu Oil	1,354	186	254	57	48	16	43	7
Açu heart	21,246	524	20,573	1,871	95,084	6,991	124,315	6,423
Brazil nuts	35,276	7,791	40,244	15,596	36,419	14,595	35,563	6,990

(Source: Anderson and Ioris 1992, 176-177)

One final point about extensivifluerices is that rubber is heavily subsidised by the state. Given that this is very costly, the government has recently been channelling more

money into plantation rubber (Allegretti 1990). Should this continue, reserves are likely to suffer funding losses.

Structure of Operational Outcomes:

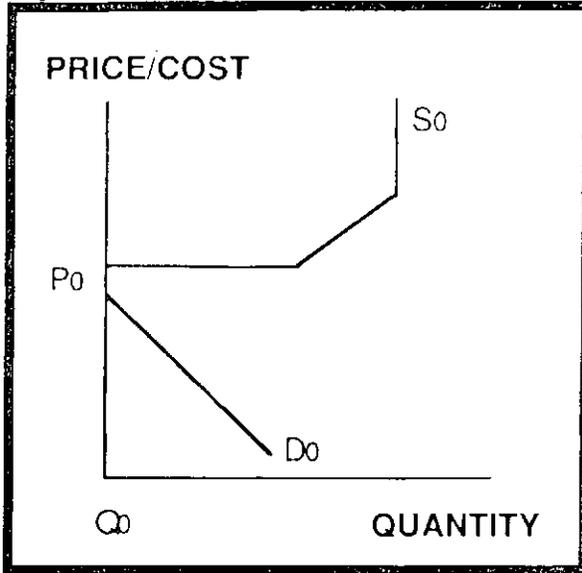
Rubber has been commercialised for over a hundred years, and has brought both good and bad to the region (see Weinstein 1983). Other products have been more recently commercialised. For instance, management of babacu, while used as a subsistence item for presumably centuries, and traded on regional levels for years, has been undergoing dramatic changes since large scale industrial commercialisation has taken place. May explains:

"Industrialists within the babacu zone have, as a result of problems in the supply of raw material to babacu oil production, intensified their search for improvements in babacu fruit processing technology hoping to reduce kernel extraction costs and obtain additional sources of revenue from by-products.... Modernising landowners appear to find whole fruit marketing more attractive than the traditional system of kernel resale. This shift has motivated a permanent alternation in methods of babagu production and resource assess in recent years. Such changes are compatible with broader changes in rural enterprise organisation and land use underway in the babacu zone, but incompatible with peasant agriculture and extractivism (1990b).

These industrial whole fruit markets will create a significant reduction in employment needs over "manual kernel extraction as well as a change of location (kernel extraction was normally carried out in the home when convenient) has led to men now earning more and more of the babacu fruit based income" (May 1990b), whereas the manual kernel processing had been left for women to do in the household. Thus commercialisation has led to an unacceptable social outcome for many of the rural poor.

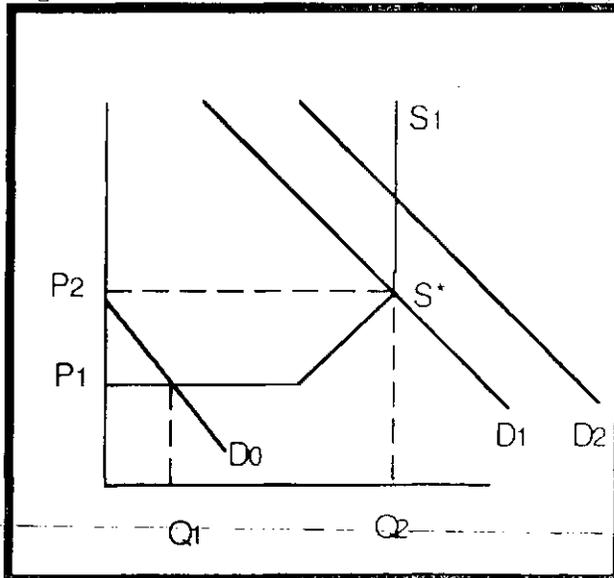
Economic efficiency: As mentioned earlier, extractive economies are --although it seems a contradiction--predictably unstable. May (1992b) explains why. In Figure 1, demand for an extractive product is presumed to be dormant (Do) while supply is abundant (So). May notes that even though many Amazonian resources are open access, marketing often requires infrastructure and proper channels. That is why the supply curve is a straight line on the y-axis, until a point is reached at which the minimum entry costs are refunded by the market price (Po). Since this price does not exist with no demand, the supply remains untouched.

Figure 1. Model of the extractive economy market.



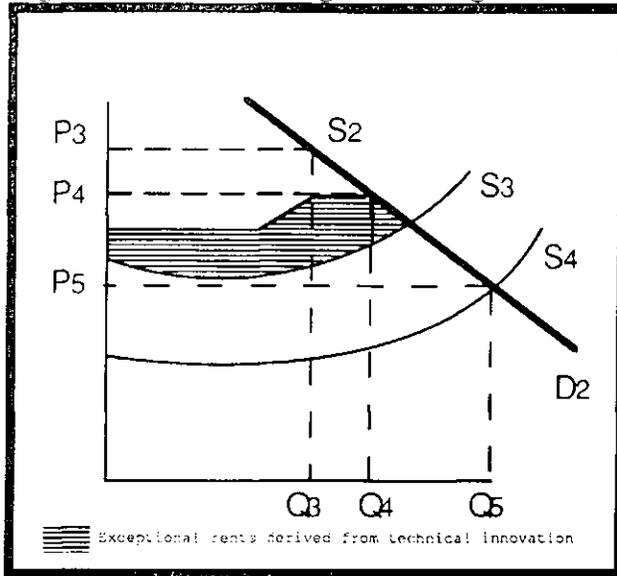
But in Figure 2, the costs of extracting are brought down and marketability increases. The supply (S_i) is still able to meet this demand (Q_i) though, since Q_i is so low. The demand curve shifts to the right (D) as more entrepreneurs get involved in the market or as technological changes occur (for example, the invention of vulcanisation shifted the rubber demand curve way to the right). However, all extractive products by their very nature have a productive limit, and a supply limitation may soon occur with accelerated demand. Supply may become inelastic to price (S^*) and the supply curve becomes vertical. Q_2 becomes the point of equilibrium -- supply will not increase no matter the price, which likely will induce overexploitation past Q_2 .

Figure 2. Demand-induced resource exploitation leads to degradation



As overexploitation begins in Figure 3, supply swings to the left, indicating increasing scarcity (S₂)- This may in all likelihood result in increased exploitation costs as remote or secondary sources are plumbed. As these costs increase, with no let up in demand, several things can happen. Substitution is often a possibility at this point. So is domestication. In the case of rubber, both happened. These innovations or changes create a new supply (S₃). The shaded area represents the rents acquired by this new source exploiting in the strong consumer demand.

Figure 3. Technological changes to meet demand



(Source: May 1992b)

And finally, supply settles out as more companies or sources of substitutes create a stable supply (S₄). Q₅ becomes the equilibrium price. Wild extractives are irrelevant at this point, and it is the collectors who will suffer most from this boom and bust cycle.

This model, of course, is simple, and assumes that demand is constant (which is not necessarily true, particularly not for 'luxury' items like palm hearts or Brazil nuts). It also assumes that substitution is feasible. And finally, and more importantly for our purposes, it assumes that the producers are unable to recognise the costs of overexploitation and cannot to act to prevent it. In this model, with constant demand, the incentives (high prices) are enough to prevent such producer action. That may not always be the case in reality, although it certainly is likely where monopolisation and social stratification (as in Amazonia) prevent communal management. Regardless, this model indicates some of the inherent economic inequalities and inefficiencies of an extractive economy.

Ecological Efficiency: Our economic model indicated the strong potential for overexploitation. Several authors have written about overexploitation of brazil nuts, rosewood, and palm hearts (Richards 1993; Browder 1992b). May attributes overexploitation in the neotropics not to the tragedy of the commons, but to what he calls the tragedy of the non-commons (where privatised and unequal land owners create pressures on the remaining open land). He explains:

"Extractive resources in the tropics are not threatened only by land conversion, however. They are also sometimes subject to degradation resulting from over-exploitation by their traditional users, due to expansion in market demand or population growth, at rates beyond their natural capacity to regenerate. Economists have tended to blame resource depletion on an insufficient measure of individual control over resource use exercised through property rights. Privatisation is the usual prescription for resource degradation problems that are assumed to arise from the tendency of individual profit-seekers to exploit open access resources at a level beyond their sustainable equilibrium. In Amazonia, however, ... the problem is that the resources at the disposal of the vast majority tend to be restricted due to a highly skewed distribution of access to property rights. Here, privatisation has led to the concentration of property rights in the hands of a few, barring entry to resource use by the majority. This in turn has resulted in pressures on limited remaining resources traditionally managed in common, thus hastening their degradation." (May 1990b).

Even when this unequal system is changed, as in the extractive reserves, ecological pressures still exist. Anderson (1992) writes that 15% of one reserve has been degraded by the tappers -- not through overexploitation, but through shifting cultivation. Some ecologists do find hope for optimism, however. Some believe that because Amazonian forests have a "high concentration of economic species and quick recovery following disturbance, these forests appear to be able to support short-cycle extraction on a sustainable basis." (Anderson and Loris. 1992). Whether this is true on a species by species basis is largely unknown.

Summary and Conclusions:

Peluso hits on the crux of the problem with extractive reserves when she writes, "the history of rainforest extraction for specific commercial products bodes ill for schemes linking commercial harvesting with rainforest protection, particularly if the rainforest is conceived to be a pristine, unmanaged environment." (Peluso 1992b, 218) Extractive reserves need to be seen as a social, and not an environmental, solution to a problem. In this manner, they can be seen as a qualified or a potential success. However this success is not because they are privatisation is the norm in extractive reserves. They are quasi-successful because they have provided secure tenure and freedom from economic exploitation for rubber

tappers. In this manner, reserves for babacu production, for instance, might also be successful in that they would allow users clear rights to trees free from patrons and ranchers' harassment. The important thing to remember about extractive reserves is that they have been created from virtually nothing; no communal management existed before. In fact, the situation was worse than open access because of the added pressures of a monopsonistic market run by patrons. Creating an extractive reserve in an area formerly or currently run by communal use rights is likely to be a disaster due to overlapping tenurial niches. Extractive reserves, in their Amazonian form, are therefore unlikely to solve any of the world's other forest problems (Peluso 1989; 1992b). In fact, Amazonian extractive reserves need to solve their own problems in marketing and income generation before this idea can be declared a wholesale success.

KEY POINTS

- creation of reserves from scratch; but previous social norms among' users
- heterogeneous population; little or no cultural similarity among users
- problem in past created incentive for future action
- commercialised product is heavily subsidised
- government support is nominal
- small population of users in a large land area
- privatised benefits; quasi-private land
- resource able to be sustainable
- moderate to low profit
- dependence on other activities to prevent instability

CASE STUDY 2: Wildlife Management In Sub Saharan Africa¹

For many Northern conservationists, the idea of wild animals is their only idea of Africa. Numerous documentaries and films have brought international concern to the plight of large African mammals, namely elephants, rhinos, and hippos, whose numbers are being decimated by poaching. Evidence suggests the state governments and NGOs are losing the war against poaching, despite international bans on trade in elephant and rhino products imposed by the Convention on International Trade in Endangered Species (CITES). Some have called for yet more national parks and wildlife reserves (Anadu 1987). But some observers are beginning to note that wildlife are essentially an open access resource that the state cannot protect. As such, continued state enforcement is likely to be unsuccessful. However, if that open access resource were restored to a common property resource (as wildlife often was before the imposition of colonialism), wildlife might be managed sustainably by local communities. Zimbabwe's CAMPFIRE program (Communal Areas Management Programme for Indigenous Resources) is probably the most well known of these decentralised wildlife programs, although other countries are now adopting them². They have been called, very prematurely, a huge success. While on the surface these programmes seem to learn from the literature on common property, at heart they lack the fundamental autonomy necessary for local communities to truly manage the wildlife on their own.

Technical and Physical Attributes of the Resource:

Wildlife are a fugitive resource; that is, they move frequently. As such, without fencing or other arrangements, management is predictably difficult. Exclusion is nearly impossible, as animals most often range over large, wide open areas. Subtractability is significant; taking animals not only contributes to fewer resources for others, but can hamper replacement rates, if, for example, only young females are killed. And finally, indivisibility is fairly prohibitive. Animals cannot be labelled as 'mine' and 'yours' —

¹ Many thanks to Clark Gibson for clarifying issues on this topic for me. Gibson is a Ph.D. candidate at Indiana University's Workshop on Political Theory and Policy Analysis. His research involves Zambia's wildlife laws and their relation to common property management.

² Zambia has a programme called Administrative Management and Design (ADMADF) and Tanzania and Burkina Faso are currently implementing their own programmes (Anon. 1991).

their free ranging nature requires extensive management, which can usually only be done communally³.

Decision Making Arrangements:

Before colonialism came to most African nations, wildlife were seen as community attributes, to be used and managed as the community saw fit. Rules often governed what, how much and when wildlife could be taken (Osemeobo 1991). These tactics, while not purposely conservation oriented, appeared to have that effect⁴. However, most colonial governments, believing that only the state could manage such a large fugitive resource (Forster 1991), nationalised most all wildlife, even if the land on which they ranged was not appropriated. This led, of course, to the usual common-property breakdown situation. The formerly managed land became open access. The situation was all the more acute in this particular case because it was so difficult to enforce regulations on free-ranging animals, and because the remoteness of many wildlife areas made state jurisdiction irrelevant and enforcement impossible. The local people generally took the wildlife they needed for meat, or killed wildlife that were damaging their crops. It was not until the large-scale commercialisation of ivory, rhino horn, and trophy hunting (facilitated by powerful modern weapons) that poaching became a serious problem. A survey of local rural attitudes in 1951 revealed that 85% of respondents thought wildlife had no value whatsoever (Thomas 1992), and as such, local people were more than happy to cull animals for meat or assist poachers. This was not surprising given that studies have shown that only 1% of safari revenues in Zambia went to local communities (Lewis *et al.* 1990). The complete failure of state management has led cash-strapped wildlife departments to consider decentralisation as an option for wildlife management, as they hope to recapture some of the community participation that had characterised pre-colonial wildlife management⁵.

In 1989, Zimbabwe implemented the CAMPFIRE program, which was to allow conferment of custodial use-rights over wildlife to district councils. Twelve of the

³ There are exceptions. Apparently the game ranching industry, where private ranches manage their own wildlife herds for meat and safaris, is big in Zimbabwe (Child 1988). This is possible only because many colonial settlers appropriated large amounts of land; any small private landowner would not be able to raise wildlife in significant quantity.

⁴ Ross (1978) is one of several researchers who have speculated that food taboos might indeed be conservation oriented, and not just a cultural phenomenon. That is, taboos often appear on animals that are rare or difficult to kill. Ross thinks this is not a coincidence.

⁵ It is certainly unreasonable to think a return to the past is completely possible. The high commercialisation of products, loss of communal lands to white settlers, and population increases all have created big changes since the turn of the century (Forster 1991). However, there can still be big incentives for communities to participate in management.

countries' councils are now involved⁶ (Murphree and Gumming 1992). The guiding rules of the CAMPFIRE, initiated by the Department of National Parks and Wildlife Management, include (from Murphree and Gumming 1992):

- That wildlife should be promoted as an economic form of sustainable resource use for enhancing rural productivity in areas to which it is suited;
- That local communities and landowners are more effectively motivated to conserve wildlife when it is of direct economic benefit to them;
- That sustainable exploitation of the resource requires cause-and-effect relationships linking good husbandry with benefit;
- That proprietorship must include the authority to decide whether to use wildlife at all, to determine the mode and extent of its use, and the right to benefit fully from its exploitation; and
- That in communal contexts the unit of proprietorship, with rights of inclusion and exclusion, should be as small as management considerations permit, allowing conformity to management regimes to be enforced by collective and informal pressure. The unit of proprietorship should be the unit of management and the unit of benefit.

As with most new programs that require decentralisation, it has been hampered by lack of funds and bureaucratic opposition (Murphree and Cumming 1992).

However, the authors conclude that:

It has nevertheless already had a dramatic impact on the financial base of operation for certain district councils, council incomes having been sharply increased. In certain wards, producers now regard wildlife as an asset rather than a liability and 'free rider' exploitation in the form of poaching has diminished. Communities have become more assertive over their claims to the proprietorship of all natural resources and have begun to make their own land use plans to exploit and conserve the range of resource available. (Murphree and Cumming 1992).

However, on closer examination of the program, it is clear that their optimism may be a bit premature.

Conditions of Collective Choice: In the case of CAMPFIRE, communities actually have few choices available; the nice sentiments of the program on paper are lost in the implementation. The communities' total choices are as follows: They may participate or not in the CAMPFIRE program. They may decide who in the community will get

⁶One point to remember is that the original impetus for this decentralisation was not for sustainable management or for local benefits. The coun

the benefits from wildlife that have been used in the area, should money be forthcoming from the district councils. That the extent of local participation. District councils - with large areas of jurisdiction based on population, not on communal management or homogeneity -- are charged with the actual implementation of CAMPFIRE. This has prompted one observer (Murombedzi 1991) to comment that CAMPFIRE is the equivalent of decentralising while retaining power, as district councils are functionaries of the government, not the communities (Zimbabwe's district councils were discussed more in depth in Chapter Two). As such, communities may not decide to manage wildlife on their own, independent of a district council. They may not decide their own kill limits. They may not exceed the set kill limits. They do not get the money immediately -- it is filtered through the government and district councils. They have no options to impose variegated management such as ranching. They may not take animals for subsistence. With all of these restrictions, it is surprising that CAMPFIRE is even working at all, given what we know about rules for success with common property. As a matter of fact, the government legislation creating wards and district councils,

has been seen to remove, rather than empower, traditional leadership. The chiefs, sub-chiefs, headmen and kraal heads in effect constituted the communal lands administrative and legal institutions with historically defined areas and sets of rules and regulations understood by the rural people. New legislation has not only removed their authority over communal land resources, it has also sought to alter their jurisdictional boundaries to accommodate the new administrative structures. (Thomas 1992, 12).

As a result, these district councils are accountable to the government, not to their constituencies. This inevitably will create conflict and tensions over priorities in wildlife management. It is easy to see that the user groups in CAMPFIRE's context are particularly ill-defined with regard to what role who plays⁷. Many observers believe that success is more likely in smaller groups, like the village level, but the government's councils are generally not yet ready to relinquish their control (Peterson 1991) The one district council that has relinquished control to local villages, the Beitbridge Council, is, not surprisingly, probably the most successful CAMPFIRE group (Scoones and Matose 1993; Child and Peterson 1991).

The main reason the CAMPFIRE program is still working in areas where district councils control the program is probably because of the system granting of cash

⁷ The original CAMPFIRE plan from 1986 apparently discussed the establishment of communal wildlife areas with clearly defined boundaries. As Thomas (1992) writes: "Such theoretical suggestions satisfy some of the criteria for successful CPR management, but they are at variance with the currently *accepted* view that the extant ward or village be the relevant unit of management. " (22)

to villages that qualify from district revenues. That is, if a district receives money for wildlife that can be attributed to a certain community's enforcement actions, that community will get some of the money. Most communities have chosen to be paid partly in communal funds for things like schools, and the rest to be divided up into cash dividends to each resident. This has at least shown the households the value of wildlife in a tangible way. It creates a positive correlation between quality of management and the magnitude of benefit (Murphree 1991). Giving the choice of how to use the money creates incentives for participation and encourages community discussion about these issues (Child and Peterson 1991). Nonetheless, the discrepancy between communities' intakes and what the district council gets are often enormous. For example, the 1991 gross income of one District council was Z\$1.6 million, although only Z\$8,500 in wildlife dividends was distributed to several wards; "the rest was channelled into expanding staff numbers and into capital investment" in a fishery (Scoones and Matose 1993).

Operational Rules: Who constitutes a household for dividend payments has been one rule that needed to be implemented in several communities. Communities themselves also needed decide how their money was to be used; whether communally or in cash, and if the money was to be communal, how was it to be spent. Operation rules regarding enforcement of the program also have to be discussed in the village. A rule in one community was that any person found poaching or taking for subsistence needs would be forced to pay the trophy price for that animal — usually far more than villagers could afford. In this way, each villager has a reason to enforce; if he sees an impala being taken, for example, he knows that means \$70 less for the community's cash dividend. This has seemed to make big difference in declining poaching (Child and Peterson 1991) although it is difficult to draw a direct correlation.

On the part of the state, use rules are often set arbitrarily. Wildlife management is often based on Western hunting experiences which may be quite unsuitable for Africa's large mammals. Dourojeanni (1978) differentiates between extensive management, that is rules on game seasons, bag limits, etc., that are set based on basic wildlife principles and without extensive populations surveys; intensive management, culling and cropping based on population sizes and reproduction classes; and super intensive management, equivalent to game ranching where almost every single animal can be accounted for. In most communal areas, it is only extensive management that is practicable, and this can be unsustainable or inaccurate.

There is some successful community management in other areas of Africa. In Namibia, the flimba, Hereto and Ju'/hoansi tribal groups all manage their wildlife

somewhat independently of the state. In the Himba and Herero's territory, all hunting (both subsistence and commercial) has been temporarily halted because the community saw their wildlife populations declining. Community wildlife guards appointed by the groups tire now enforcing this rule. The presence of outsiders in this small community is easily detected, and therefore outsider poaching, the main cause of the decline, has been reduced. Some species populations are said to have increased up to tenfold in numbers in three years (Bieseke *et al.* 1992). In the Ju'/hoansi's land, the community's Environmental Planning Committee decided to stop safari hunting for two years to allow time to assess the wildlife populations and work out systems of quotas. Enforcement has been through the local farmer's cooperative (Bieseke *et al.* 1992). These cases clearly show that when given a chance, communities can make sound and sustainable wildlife management decisions.

External Arrangements: The state retains almost all power in most African 'community management' arrangements (Thomas 1992). The wildlife still belong officially to the state. The state sets game quotas and designs management plans for the communities. The state vetoes unacceptable plans. As Ostrom (1990) says, "if external government officials presume that only they have the authority to set the rules, then it will be very difficult for local appropriators to sustain a rule-governed CPR over the long run." (101) Thomas (1992) thus notes that individual villages must be allowed to adopt their own by-laws in order to legitimise village leadership on wildlife issues. So far this has not happened. In effect, then, there is no community management in most of Africa (Gibson, pers. comm. 1994).

Other external actors in this drama are the member states of CITES, which has banned any trade of elephant products, despite calls to allow some culling for commercial purposes from some African states with herds that are too large (Botswana, Zimbabwe, Namibia) (Ivory Trade Review Group 1989). Finally, NGOs often play a large role in funding wildlife departments and setting conservation rules (Gibson, pers. comm. 1994) and have big impacts on how wildlife is managed.

Structure of Operational Outcomes

Economic Efficiency: The most successful parts of these programs have been the benefit distribution systems. Less successful, however, is the effect on subsistence hunting. Is it fair to deny local communities meat and instead require them to let outsiders pay more for the animal to take it as a trophy? One could argue that it is not, and could create much resentment. The valuation of wildlife is one of the most difficult problems in creating true community management. As Gibson (pers. comm. 1994)

says, "A key question is who is doing the valuation'." Are community members really getting a voice in what species they consider valuable? Or are these choices made for them by departments or other industries (hunting, tourism)'."

Wildlife utilisation can usually take one of four forms: consumptive (meat); marginally consumptive (trophy hunting); non-consumptive (game viewing); and existence values (the option value of saving species). Although Child (1988) writes in regard to private game ranching (see also Mongi 1978), many of the points he makes about wildlife management are pertinent to communal management as well. That is, that wildlife is a unique commodity that is not substitutable because it occupies a specialised niche⁸; tourism is a fast growing industry that is less vulnerable to market fluctuations and recessions; and wildlife viewing/hunting generates foreign exchange. In these ways, it is quite economically efficient and probably practical to continue the commercialisation of wildlife. However, the subsistence use issue needs to be resolved. [Additionally, it should be noted that safari operators - which get the largest amount of money in many areas -- are rarely local people (Murphree 1990a; Murombedzi 1991).]

Environmental Efficiency: Poaching rates have gone down in only some areas under community management. Gibson (pers. comm. 1994) believes that it is too early to attribute these lower rates to decentralised management and instead believes the lower rates come with the increased enforcement associated with new programs. The problem of determining what programs are sustainable is compounded by the fact that many wildlife departments are strapped for money and may not have the resources to actually make sustainability surveys. Therefore it is currently impossible to judge the environmental sustainability of local management.

However, as Child (1988) notes, wildlife management can often take place in areas too degraded or too unsuitable for livestock or agriculture. This is particularly relevant for game ranchers, many of whom formerly raised livestock, which tend to be more environmentally destructive than natural wildlife. The same environmental benefit can accrue to communal areas as well, but is only likely to happen if there are no opportunity costs of using the land: that is, if the land is unsuitable for agriculture (note however that there are opportunity costs when it comes to elephants destroying neighbouring crops (Yeager and Miller 1986; Murombedzi 1991))

⁸ However, marketing of wildlife can be particularly difficult, for hygienic (Asibey 1978) or other reasons (Muir 1987). Local markets are easier to penetrate in terms of meat; ivory and hides, safaris and trophy hunting are almost exclusively for the international market. These all tend to be luxury items, but Becking *et al.* (1993) claim that hunting is now done by industrial

Equity: The current system of benefit distribution through district councils is not equitable. The use of District Councils in Zimbabwe to manage the local distribution of benefits creates unequal situations. Villages sustaining the most damage from crops, for instance, will not necessarily get the largest amount from wildlife receipts. A similar situation has occurred in Zambia. There, village chiefs, and not district councils like Zimbabwe, are the wildlife department's chosen conduit for local wildlife management. However, the chiefs have been known to steer scouting jobs to relatives, or to choose projects for villages that usually only directly benefit the chief or his family (Gibson and Marks 1994)

Summary and Conclusions:

As Murphree (1991) points out:

'Participation' and 'involvement' turn out to mean the co-optation of local elites and leadership for exogenously-derived programmes; 'decentralisation' turns out to mean simply the addition of another obstructive administrative layer to the bureaucratic hierarchy which govern natural resource management. What is required is the establishment of communal property regimes by defined groups in defined areas. Such groups should have proprietorship of the natural resources concerned, 'proprietorship' being used here to mean a sanctioned use-right, including the right to decide whether to use the resources at all, and the right to determine the mode and extent of their use, and the right to benefit fully from their exploitation in the way they choose. (5)

A solution that might be more palatable to the government, proposes Murombedzi, would be co-management between the various institutional levels with "clearly defined rights and obligations both with regards to the resource and with regards to other co-managers." (1991, 18)^o. Gibson remains dubious about all these 'community' management schemes, no matter what form. He notes that, "one of our major contentions is that the good offered by most of the programs mimic public goods — the managers of the programs do not exclude anyone from their use. Therefore, there is no incentive for an individual to give up their hunting to acquire the new school, clinic, etc. and they will free ride on them. Stepped up enforcement is helping big animal populations but hunters are turning to less easily detected means of hunting (snare, smaller animals) and then visiting the new clinic." (pers. comm. 1994; also see Gibson and Marks 1994) Unless community institutions can solve this free rider problem success for wildlife management may remain elusive.

Uphoff (1992) notes that institutions operating at different levels are actually **more productive than a**

KEY POINTS:

- colonial exploitation of commercial products led to usurpation.
- user groups not identified and given responsibility
- user groups need to be small or homogenous but are not
- state retains management authority and control.
- Benefits are chosen locally; individualised benefits makes incentives strong.

(For more information, see Kisangani 1986; Kiss 1990; Marks 1984; Muir 1987 and 1988; Murphree 1990b and 1993; Pinchin 1992; Swanson 1991)

CASE STUDY 3. Biosphere Reserves and NTFPs in Guatemala¹⁰

Ever since the time of the ancient Mayan civilisations in the Peten of Guatemala, NTFP use has been a major part of this area. Today, three main export commodities dominate the extraction scene. These are chicle (latex from *Manilkara zapota* trees); xate palm fronds used in floral arrangements (*Chamaedorea spp.*)¹¹ and allspice, a spice from the fruits of the *Pimento dioica* trees. Chicle has been exported since at least the late 19th century (Schwartz 1990). Xate and allspice have been commercialised more recently in this century.

Like the rubber tappers of Brazil, extractivists make a living from exploiting all these NTFP resources. The average family can earn three times the average daily wage by harvesting NTFPs in the Peten (Reining and Heinzman 1992). The situation, however, has been complicated somewhat by the designation in 1990 of the northern part of the Peten -- 1.6 million hectares -- as the Maya Biosphere Reserve. This has made some prime NTFP extractive areas off limits, while other areas in the reserve are still exploitable. This may change however, as the government is considering banning extraction in even more areas (Dugelby 1994a).

Technical and Physical Attributes of the Resource:

The forests of the Peten contain fairly high densities of all three major NTFPs; therefore, harvesting time is lower than in other more dispersed forests. Additionally, the temporal availability of each product is complementary and does not compete with agriculture (Salafsky *et al.* 1993). However, divisibility is a problem: the resting time required for chicle trees between tappings is 5-7 years; therefore harvesters need to harvest over wide ranges to avoid overlapping (Dugelby 1994a). Subtractability is also affected to a certain degree, although replacement rates for allspice and xate are less lengthy than chicle. The lack of discrete boundaries makes exclusion of such a large reserve a problem¹¹. Even within the reserve, contractors often have overlapping territories for extraction.

¹⁰ Many thanks to Barbara Dugelby for sharing her research with me. Dugelby is a Ph.D. candidate at Duke University's School of the Environment and Center for Tropical Studies. Her research focuses on NTFP extraction in the Maya Biosphere Reserve and evolving institutions for local management of resources.

¹¹ Indeed, there are serious problems with illegal aliens from Mexico and Belize coming into the reserve to harvest the products. This is compounded by the fact that contractors are beginning to show preferences for the aliens, claiming they work harder (Dugelby, pers. comm. 1994).

Decision Making Arrangements:

Participants in the extraction of all three main NTFPs tend to be heterogeneous groups, although the group may be together with the same management contractor for a number of years (Dugelby 1994a). The work seasons usually last several months, during which time the harvesters are camped in the forest and away from their families and regular communities (Schwartz 1990). Despite this heterogeneity and transience, these harvesting groups seem to have evolved a number of informal decision making mechanisms, as have the contractors.

Conditions of Collective Choice: One "problem with extraction in the Peten is that the harvesters are not yet organised into cooperatives as are the Brazilian rubber tappers. As a result, the individuals who are making the real money in the xate, allspice and chicle industries are the contractors and exporters." (Nations 1992). However, no one, neither the harvesters or contractors, have secure resource tenure in the area. This has created an open access type situation on state land (Dugelby 1994a) although the contractors appear to regulate amongst themselves to some degree.

Operational Rules: While the Peten is actually state owned land, there are few rules on extraction activities in non-reserve areas. Contractors need licenses to operate in the reserve with their groups of harvesters, and certain areas of the reserve are supposed to be off limits to extraction. The government also plays a large role in buying chicle for export through a government agency (Dugelby 1994a).

Informal rules have developed, however, among the extractors (chicleros). "Voluntary cooperation and mutual trust is strong among harvesters in both camp and work activities. Harvesters speak very proudly of their *comradery* and the respect for territories of their fellow harvesters while collecting in the forest." (Dugelby 1994a, 16). Moreover, there is "strong social pressure to carry out harvesting activities in a manner in which trees are not fatally injured or overtaxed during tapping" (Ibid. 16).

There are also informal rules and understandings about division of territories among the contractors for whom the chicleros work. "The limited number of contractors, and their informal monopolies over traditional harvesting areas seem to give them a long-term interest in preserving the resource base. Likewise, many of the harvesters work with one another and with one contractor on a long-term basis, and therefore have incentives to cooperate in maintaining productivity." (Salafsky *et al.* 1993, 45). The larger, more established contractors are able to keep relatively tight

into areas that are not ready for re-tapping. This is because of a lack of information sharing among the contractors as to tapping schedules (Dugelby 1994a. 15). This is one major impediment to sound management in the area.

External Arrangements: Extractive industries in the Peten have succeeded because they benefits some of the powerful elites of the area, who own the contracting or exporting businesses (Salafsky *et al.* 1993). Even though the national government declared part of the area a biosphere reserve, the integration of extraction into the reserve has not been as difficult as it might have been. However, the protected areas within the reserve may be expanded in the future. The uncertainty as to the future availability of land for harvesting creates problems in adapting long term management schemes. In regards to the currently used areas, the state sets few operational rules. It does operates informally with the chicle contractors' union, although the contractors have no real say in how licenses, etc., are granted (Dugelby 1994a).

The biggest problem in the future may be the encroachment of outsiders into the area:

Xate and allspice production in the Guatemalan Peten is already threatened by inexperienced harvesters entering the industry. Not knowing how to harvest xate, they cut all the leaves on a palm and end up killing the plant. Inexperienced or lazy allspice gatherers cut down the trees and harvest the seeds in a onetime rip-and-run operation.... One proposed answer to this problem has been government licensing, by which experienced xateros and allspice gatherers would train new harvesters in how to properly harvest the products. After completing a short course, individuals would receive a license that would allow them to harvest the products in designated areas." (Nations 1992)

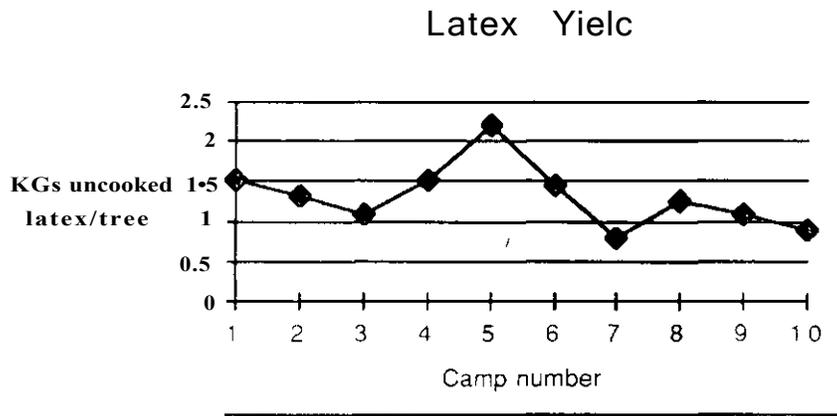
Structure of Operational Outcomes:

Economic Efficiency: As Nations (1992) notes, "extractive reserves are not without problems. One problem is economic -- namely that markets change. Substitutes for products are discovered, much as tapping *sorva* trees in Brazil led to the temporary collapse of the chicle industry in Guatemala during the early 1980s. However, one advantage of extractive reserves is that they do not have to depend on only one or two products. Economic diversity can emerge from the biological diversity of the forest." However, this diversity does not create complete economic independence. For example, the demand for allspice is dependent on the success of the Russian herring catch because it is used as a pickling agent (Salafsky *et al.* 1993). Xate's future is uncertain; however, it is certainly more like a luxury item than a staple, and as such, may be elastic in demand. However inconsistent the demand for these product may be.

extraction in the Peten is aided by good transportation and the non-perishable nature of the extractive items (Salafsky *et al.* 1993)

Environmental Efficiency: The extraction of NTFPs in the Peten can be sustainable, if done properly. Xate fronds can be removed without harming the reproductive parts of the plant, and chicle is non-destructive if trees are allowed to rest between tappings (Salafsky *et al.* 1993). However, new immigrant tappers are believed to be fatally injuring trees by cutting too deep or overlapping (Salafsky *et al.* 1993; Dugelby 1994a) and research indicates that xate fronds were found at much lower densities in harvested areas as compared with protected park areas (Salafsky *et al.* 1993) Dugelby (1994a) has also found that latex yields were higher in a camp that was tapping trees illegally in a protected part of the reserve (camp 5 in Figure 1), indicating that the lower yields in other parts of the forest are likely due to more intensive harvesting.

Figure 4. Mean Latex Yields per Tree in Study Camps



(Source: Dugelby 1994a)

The fact that all the NTFPs are bought by quantity and not quality also creates "incentives to harvest as much as possible as quickly as possible, regardless of marketability, thereby increasing the potential for stressing plants beyond what is ecologically sustainable." (Dugelby 1994b)

Equity: Although the contracting system can be unfair at times (the contractors often advance credit on food at inflated prices in return for chicle from their chicleros) there is little hope that the chicleros can manage the resource without the contractors, as the Brazilian rubber tappers have tried to do. Dugelby (pers. comm. 1994) notes that management without the contractors would be particularly difficult because the harvesters have no access in the financial resources needed to run a chicle camp. Some

unions do exist, but are poor representatives of the harvesters. The contractor system may, in fact, actually offer some advantages, in that it improves efficiency and management, and, if rules on harvesting are ever designed, would be a good vehicle for enforcement (Dugelby, pers. comm. 1994).

Summary and Conclusions:

Dugelby is somewhat optimistic that appropriate management can evolve for the Peten's extractive activities. She notes the long history of extraction of chicle; the well developed export industry; and informal rules among contractors about harvesting that seem to be based to some degree on sustainable use of the resources (1994a, 4). By understanding the current patterns of resource use, Dugelby believes co-management could evolve within the biosphere reserve. She notes the need for both resource tenure (perhaps long term leases) and well defined and enforced rules for the industry concerning resource use. Without these, institutional incentives for all interested players in the region are low, and the situation may continue to deteriorate.

KEY POINTS:

- CPR evolved from the commercialised product
- no CPR previously
- heterogeneous population, though small
- Insecure tenure; state retains land alienation though not management authority
- no information sharing among users
- individual benefits to harvesters
- informal social controls among harvesters and contractors to conserve

CASE STUDY 4. Ethnohistory of the North American Fur Trade

Based on archaeological data, it appears that Native American societies lived in fairly comfortable equilibrium with their environment for thousands of years, even at very high population densities (Cronon 1983; Crosby 1986). However, had an observer been able to compare this equilibrium with the extreme environmental damage caused by native Indians after colonial contact, he might not have recognised the two systems. The near extermination of many fur bearing animal species, particularly beaver, in several different time periods after the 16th century had one explanation: commercialisation. The commercialisation "of the demand for the resource made the demand largely independent of the size of the local population and undermined the cultural adaptations that had effectively conserved the resource." (Repetto and Holmes 1983, 613) The tremendous effect that commercialisation had on the wildlife of North America operated almost entirely independent of socio-political problems and other pressures on resources, and as such, an ethnohistory of the problem provides an interesting case study.

Technical and Physical Attributes of the Resource:

Although it is impossible to estimate the extent of fur animals in the North American continent, we do know from records of the fur trade that the number of animals killed, especially beaver, were enormous. Because the resource was fugitive, divisibility was difficult, although various tribes did have mutually respected hunting grounds (Brightman 1987). Exclusion was difficult for these grounds, but bonds between tribes based on informal trade and reciprocity appear to have kept outsiders out of others' areas. As a further point, the subtractability of fur animals is high; it also has bearing on the replacement rate if reproductive animals are not left.

Decision Making Arrangements:

Conditions of Collective Choice: Hickerson firmly believes, based on ethnohistorical evidence, that individualisation of fur trapping came about only because of the commercialisation of the fur trade with Europeans. Previous to contact, fur trapping was done in tribal groups. Post-contact, trapping was separated from communal life and the trade in furs contributed to the break-up of tribal structures of hunting patterns.

There is no evidence of individual land ownership among Native Americans prior to the 1770s (Hickerson 1967), and collapse of communal structures came slowly after Europeans had firmly established strongholds of trade. Prior to that, the means of production had been almost entirely contained within the tribal community, and with distribution to all in the community. But "individual efficiency became increasingly important as Indians came to concentrate more and more on fur trapping which involved the seasonal dispersal of large communal groups into family units" (Hickerson 1973, 23). Indeed, Hickerson notes that the fur trade season coincided with traditional subsistence fishing and hunting seasons, the times when communal activity had been the strongest.

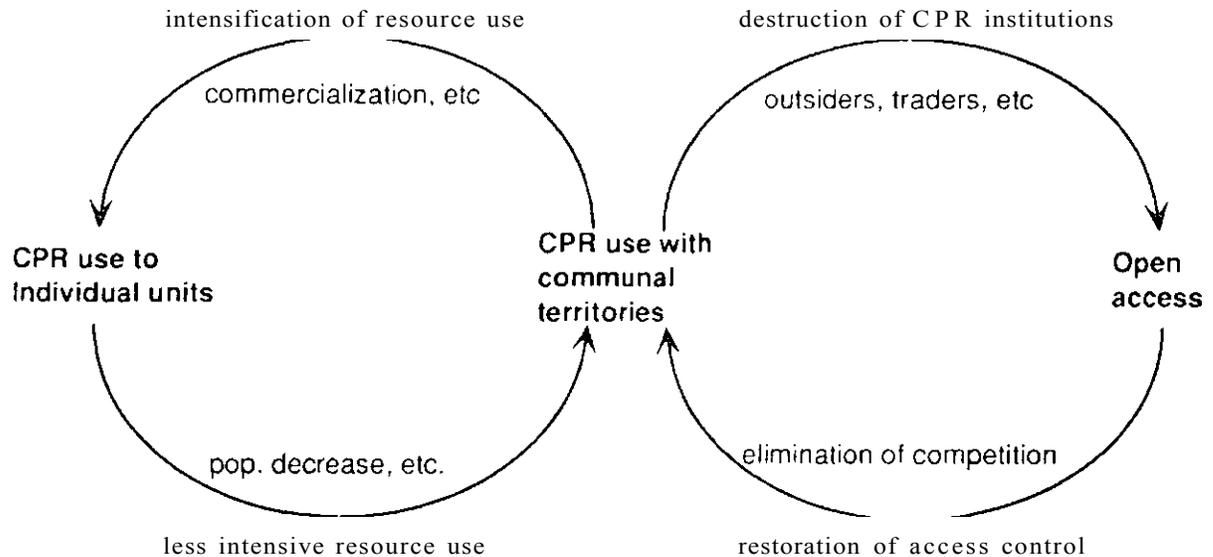
Operational Rules: The quality and quantity of furs that Indian traders brought to market depended on traditional material cultures, degree of dependence on Europeans and local ecological factors. This meant that fur supply schedules were erratic and did not match the steady European demand (Ray 1978). Hunters often did not bring in more pelts just because prices rose. And as hunters made more money, they would often bring in even fewer pelts. These problems moved the European trading companies, in Ray's opinion, to begin to offer more specialised goods to the Indians that they would become dependent on: for instance, alcohol and shotguns. The issuance of highly inflated consumer goods in return for a specific commodity mirrors almost exactly the situation facing Brazilian rubber tappers today (cf. Romanoff 1992; Schwartzmann 1991)

Because prior to the colonial occupation trade had not been for personal gain, the "emphasis on obtaining fur rather than food and the shift of economic relations from within the band to outside the band community consequently changed relations within the community from cooperative to competitive. Under those conditions the individual family became the basic economic unit." (Hickerson 1973, 29). This dissolution of tribal communities led to the *de facto* privatisation of some hunting grounds and open access rules on others. Former trespass rules and benefit dividend policies fell behind as well.

Berkes (1989a) notes, however, that forms of cooperative hunting are now being practised again amid the Cree Indians of James Bay, Canada, and provide a model of how old systems might have worked. |These management regimes are supported in no small measure by the legality of formal tenure and rules allowed by formal government recognition of their rights! The operation rests on leadership; one person acts as a "beaver boss" and allocates hunting territories and bag limits based on **his knowledge of the resources of the area. Berkes believes that this system has**

evolved over time, whereas other Amerindian systems may not have, due to its flexibility. He outlines the evolution of rules in the following way:

Figure 5. Cycles of Intensity in Resource Use



(Source: Berkes, 1989a, 80)

As situations changed, the Cree hunters adapted their management systems in the above fashion. In times of population increases or commercialisation, part of the community institutions were privatised. When those pressures let up, community control could be re-instated. The model makes the point that internal pressures (such as population or overharvesting for cash incomes) tend to produce privatisation while external pressures (outsiders, modernisation) may tend to produce open access situations.

External Arrangements: In addition to inter-tribal disintegration of communal hunting areas into privatised individual ventures, one other consequence of the Europeans' foray in North America was the dissolution of traditional reciprocity relationships among formerly peaceable tribes. Trade intra-tribe was not always a means into an end. Instead, it served as a social structure that helped establish cooperative, if not exactly friendly, relationships with tribes that otherwise might be competing for like resources (Hickerson 1973). However, with commercialisation of fur, this severing of intra-tribal mutual respect led to the treatment of many Indian hunting grounds as open access by members of other tribes (Hickerson 1967).

Structure of Operational Outcomes:

Because of these breakdowns in management regimes, open access was the norm in much of the North American fur trapping country. The beaver was harvested to the brink of extinction several times, and even the trading companies began to encourage conservation practices among the Indians in order to assure a steady supply (Brightman 1987). There is little doubt that the fur trapping system could have been more economically efficient because the demand for pelts was inelastic and would have provided a steady source of income. It is likely that fur could have been harvested in a sustainable manner if the traditional CPR regimes had not been encouraged to break down by the destructive debt/patronage systems perpetuated by the trading houses.

Summary and Conclusions:

There should be no doubt that heavy commercial demand coupled with inequitable trading relationships can contribute to both CPR breakdown and resource degradation. Although the evidence in this case is based on archaeological data and historical conjecture, the record is fairly clear that commercialisation was the cause of institutional breakdown of communal hunts in Native American lands. The high intensity of commercial demand coupled with the high dependence of the Indians on trade goods seemed to contribute to this situation.

KEY POINTS:

- management broken by individualisation of hunts; encroachment by others
- overharvesting not prevented through social or informal means
- high inelastic demand for product
- high dependency of collectors
- colonial exploitation as well

CASE STUDY 5. Open Access in the Pacific Northwest, USA

The Pacific Northwest coast of the US is best known for its expanses of Douglas fir forests. The timber harvest in these areas contributes significant amounts of money to local communities. However, a newly commercialised product is sprouting up in the NW forests -- mushrooms. The collection of several varieties of mushrooms for export to Europe and Japan has suddenly become a booming -- and dangerous -- business, one with which current management systems for the forests are unable to cope.

Technical and Physical Resource:

The large tracts of national forests located in the Pacific Northwest of the US are government owned and are open access for individuals. The timber harvesting areas are co-managed with commercial timber operators. The forests are open access for almost any other commercial resource, including mushrooms and other NTFPs. While timber companies are allowed to bid for concessions that allocate long term leasehold and management to certain areas for commercial purposes, this right has not been extended to any other product. As such, the open access nature of a commercialised NTFP resource -- the mushrooms -- has created almost total chaos.

The mushrooms sprout every year, and harvesting is thought to be benign, so subtractability is not as serious a problem as for NTFPs in other case studies. Exclusion is a significant problem, however, since the tracts of national forest land in the NW cover almost 10 million ha.

Decision Making Arrangements:

None exist. It has been estimated that 8,000 mushroom pickers descended on the woods last year, up from a few hundred in the late 80s (Egan 1993). The surge in picking is because of the high prices mushrooms began bringing in the 90s, due mainly to a drop off in supply in Eastern Europe attributable to Chernobyl (Sinko 1991). The supply shifted to the US forests, and "the Forest Service, an agency that make most of its money selling timber, has been somewhat taken by surprise by the mushroom mania. It is studying whether to regulate and charge more for permits to pick". (Egan 1993). Currently, pickers only pay \$1 for all they can pick and buyers are

charged \$500 for a permit to do business for a season. A picker can make over \$ 100 in a few hours.

Conditions of Collective Choice: Before mushrooms became commercialised, specialised groups of amateur mycologists (mushroom specialists) used the products in a CPR-like fashion¹². Information about the best mushroom spots was tightly held, and several magazines devoted only to mushroom-tip sharing circulated (Richards 1993). User groups, like the Oregon Mycological Society, were even formed. But these groups did not expect the competition due to commercialisation, which is now "pitting highly independent old timers protective of their mushroom treasure spots against groups of hired harvesters" (Knickerbocker 1993). The lucrative trade has brought in thousands of outsiders because there are no formal institutions to deal with harvesting. The situation has become "a case where people are trying to make a living in a competitive situation without rules" (Knickerbocker 1993).

External Arrangements: The non-local pickers are territorial, often defending the areas in which they are harvesting by brandishing guns (Richards 1993). There is no collective collaboration. The mushroom buyers are similarly unable to regulate themselves in any fashion, due to the huge number of outsiders who have joined the trade, and the impossibility of tracking each one down to get them to contribute to management. Local buyers have thus suggested either that the government regulate the trade through better permitting and enforcement (Knickerbocker 1993) or that NTFP contracts be given by the Forest Service much as timber contracts are (Egan 1993). [Other possible NTFPs to be commercialised in the future might include pine nuts and sword ferns and moss to gardeners!

Structure of Operational Outcomes:

Economic Efficiency: The mushroom business has been estimated to bring in \$40 million a year to Oregon state alone (Egan 1993). The world-wide business in mushrooms is \$665 million (Richards 1993). The fact that mushrooms are a high-value and low-volume trade has probably intensified the commercialisation process.

Environmental Sustainability: The mushroom harvesting is probably sustainable, but the Forest Service is "looking at whether the intensive harvesting will upset the ecological balance of the forests." (Egan 1993)

¹² Apparently, some local residents use the national forests for firewood in the same way. Old -timers in the area pay small fees to collect firewood to the government and appear to stick to the rules on harvesting, while newer collectors may not (W. Stewart, 1994, pers. comm.).

Equity: The open access situation creates no equity at all. In fact, intimidation and violence have become common as people search for the valuable mushrooms and try to enforce territorial rights. Two pickers were shot and killed last year, and their mushrooms and wallets stolen. Others have been robbed at gun-point or threatened, and several drive-by shootings have also occurred. Rangers have started wearing bullet proofjackets in certain areas (Richards 1993).

Summary and Conclusions:

This simple case study shows what enormous pressures can arise in short periods of time from commercialisation. It also suggests that where commercialisation occurs in open access regimes, disputes, overharvesting and, in this case, territoriality equivalent to privatisation may ensue. This is hardly a typical case, but it does demonstrate the power of the market, especially how the market needs only a short time to disrupt a management situation.

KEY POINTS:

- informal access on state land completely overwhelmed by commercialisation
- high value brings heavy encroachment, particularly with easy/portable product.
- overharvesting not as detrimental due to nature of product
- state controls inadequate to deal with sudden demand; bureaucratic inability to react quickly.

APPENDIX TWO - User Group Rules

Examples of User Group Rules and/or Enforcement

(especially with regards to commercial products)

Resource:	RULES:	ENFORCEMENT:
Panday Ban Forest, Nepal ¹ (7ha mixed broadleaved forest used by 35 households)	<ul style="list-style-type: none">• Leaf litter can be collected at any time except during the monsoon.• Dry firewood, rhododendron flowers, grass and small bushes can be collected at any time.• Cutting of green wood or green leaves is prohibited	<ul style="list-style-type: none">• All members of the village assist in enforcement.• All member households are listed on a piece of paper which is placed inside a piece of bamboo. The bamboo passes to each household in order. The day the bamboo arrives, one household member must guard the forest.
Edo State, Nigeria ² : (stratified sample of 400 respondents in total settlements of 2000)	RULES <ul style="list-style-type: none">• Access to land is restricted by specific rules• Access to wild plants is free access to locals• Access to wild animals is free to locals• Access to aquatic animals is subject to harvesting rules• Access to water is open access	ENFORCEMENT: <ul style="list-style-type: none">• Council of elders on clan land.• Family heads and village heads on village lands.• Family heads on communal family land

¹ From Fisher 1993.

² From Osemcobo 1994.

**Tenganan
Forest, Bali³**
(200ha in
village of
3,500)

RULES:

- Certain trees are forbidden to be cut while growing.
- Tree cutting is permitted for individual construction use but a permit from the village head is needed and the tree must be sick or overtopped.
- Tree cutting for community purposes is done regardless of the condition of the tree but must be decided by the village.
- Pruning on shade trees in the village yard needs approval of the head.
- If a protected communal tree is cut on privately used land, half of it goes to the 'land owner' and half to the village. If a 'land owner' cuts a tree and does not sell it, he may keep the timber, but if he sells it, he must pay a fine equal to twice the price he got for the timber.
- Fruit may only be collected off the ground and not from the trees.
- Whole blocks of trees may not be sold. They must be scattered throughout the forests.
- Cutting permits are charged for timber and fuelwood cutting with profits to the village.
- Palm wine trees may not be cut on private or public property

ENFORCEMENT:

- For wood stealing, the thief must pay a fine to the price of the timber plus 2000 kepeng more.
- If the thief is a member of the village, he may be thrown out.
- If someone cuts branches that could cause the death of a tree, they are fined 25 kg of rice.
- If someone outside the village picks up fruits, he will be fined 25 kg of rice.
- If a village member steals fruits he will be thrown out of the community.
- If anyone cuts a palm wine tree they will be fined 400 kepeng and the tree is confiscated.
- Recidivists face social scorn and will not be allowed to visit homes of neighbours.
- If he further violates rules, he will not be permitted into temples.
- The next stage of action - no one will speak to him.
- Then he will be thrown out if he persists.

³ From Tantra 1990.

N' Dounkoye

Mali (150 residents and 70 km² forest land)⁴

RULES:

- Complicated and varied set of rules and beliefs restricts harvesting of fruit, nut and leaf products of trees. These rules generally become more specific in direct relationship with the value people place on the product.
- Individual trees of the most valued species have registered usufruct rights with the village head.
- Baobab harvesting is limited to a specific season.
- Fruit can only be harvested once fallen.
- Locals may use any firewood for home or sale.
- Outsiders need paid permit from chief to cut per season.
- Strangers are not allowed to cut live wood.

ENFORCEMENT:

- Enforcement of use rules depends on where the trees are.
- A few baobabs are inhabited by spirits which determine when they can be used.
- Outsiders are not allowed to harvest anything more than they can immediately consume.
- Formal patrols of young men armed with guns patrol at irregular intervals. It is a village honour to be selected for guarding -- based on courage and honesty.
- Anyone cutting live fodder without permission is fined.
- Patrols are paid with money from fines collected.
- Village residents also co-monitor, especially against transhumant pastoralists.

⁴ From Dennison and Thomson 1992

San Rafael,
Peru (323
residents with 5
km² communal
forest reserve)⁵

RULES:

- It is prohibited for individuals, families and groups to extract timber from the community reserve. The extraction of timber is only permitted when the community needs money for communal purposes, such as a new school or medicine for the village.
- Nontimber forest products can be extracted by any individual, family or group.
- Poles and other local construction materials can be extracted by an members of the community. Extraction for commercial purposes is limited to small quantities and to certain periods of the year.
- The extraction of fruits and medicinal plants is permitted to everybody. People from the community and from the neighbouring communities can extract these products either for their own consumption or for the market.
- In collecting fruits, leaves, flowers, bark, resins, roots and branches, cutting trees is prohibited. The extraction of particularly valuable species is regulated by special rules
- Timber extraction by non-members of the community requires a special permit issues by the community

ENFORCEMENT:

- Guarded by community members in turns
- Quasi-legally recognised by Ministry of Agriculture

⁵ From Pinedo-Vasquez 1990