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**Social Coordination and Forest Conflicts: A Case Study on
Sarawak, Malaysia**

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**A Thesis submitted for the degree of Doctor of Philosophy, Department of
Economics, Faculty of Business and Economics, Monash University**

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List of Abbreviations

Anor	Another (Used in Court Case References)
CFs	Communal Forests
dbh	Diameter at Breast-Height
dtb	Diameter at Top of the Buttress
DP	Detailed Harvesting Plan
EIAs	Environmental Impact Assessments
f	Female (Used in Court Case References)
FEP	Forest Engineering Plan
GP	General Harvesting Plan
ha	hectares
ITTO	International Tropical Timber Organization
MDFs	Mixed Dipterocarp Forests
NPs	National Parks
NPV	Net Present Value
Ors	Others (Used in Court Case References)
PFEs	Permanent Forest Estates
RM	Ringgit Malaysia (Malaysian Currency)
SAM	Sahabat Alam Malaysia (Friends of the Earth Malaysia)
Sdn Bhd	Sendirian Berhad (Private Limited)
SFs	State land Forests or Stateland Forests
sq	square
STA	Sarawak Timber Association
TPAs	Totally Protected Areas
v	versus (Used in Court Case References)
WSs	Wildlife Sanctuaries
WWF	World Wide Fund for Nature (formerly known as World Wildlife Fund)
WWFM	World Wide Fund for Nature Malaysia (formerly known as World Wildlife Fund Malaysia)

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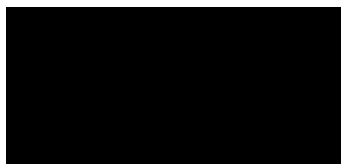
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Signed Statement

This thesis contains no material published or submitted elsewhere for a degree or diploma, by myself or another person, except where due reference is made in the text to such publications or works.



Poh Onn LEE

Abstract

This thesis examines forest use conflicts in Sarawak from the 1980s to mid-1990s. Conflicts have occurred between groups interested in different forest functions, ranging from concerns raised by some interest groups about forest use, to road blockades by native groups protesting over logging activities. The use of forests for a particular purpose can negate their use for another. For the appropriate decisions to be made, information on forest values must be signalled to all interest groups, and incentives must be present for them to consider the concerns of others interested in forests. This leads to the concept of social coordination, which is defined as individuals acting in a manner consistent with the concerns of others.

Drawing from theories of neoinstitutional economics and public choice, an analytical framework has been developed to examine factors influencing social coordination over the use of Sarawak's forests. Forest property rights must be clearly defined and enforced to enhance social coordination and to reduce conflicts. The framework consists of four stages:

- I) identifying forest functions and interest groups;
- II) examining the extent of property rights definition and enforcement for each forest function;
- III) investigating economic barriers in specifying (defining and enforcing) rights;
- IV) investigating political barriers in specifying rights.

Data sources include information from legislation, forestry reports, published sources, and personal field notes.

Seven forest functions and groups have been identified in Sarawak. The definition of the various forest property rights has been incomplete, generally insecure, and non-transferable, while enforcement has also been lacking. Notably, conflicts have occurred when property rights defined for the various forest functions have not adequately taken into account the concerns of native communities and of their traditional laws.

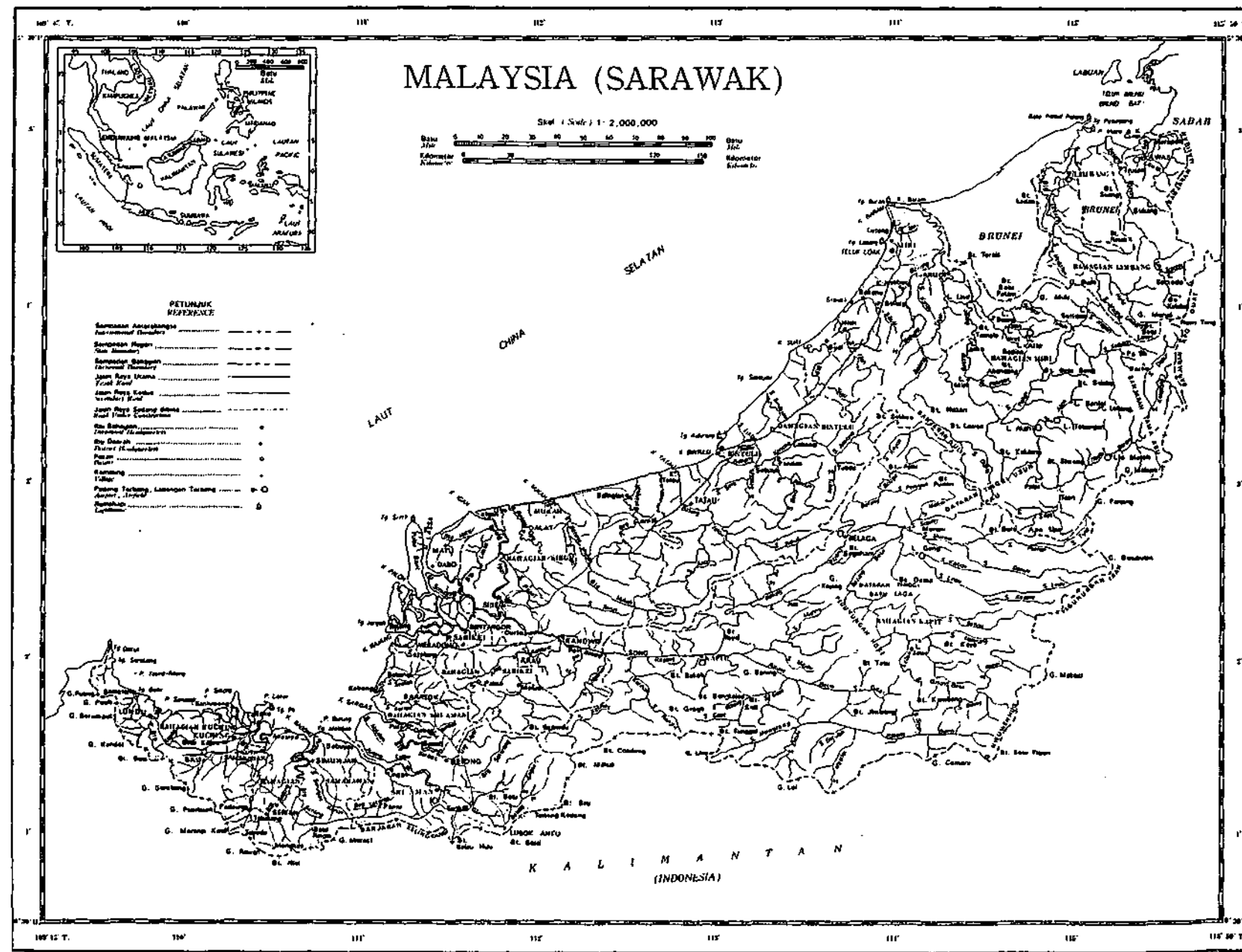
What has caused the specification of property rights to be incomplete? First, economic barriers make specifying rights costly. Proposed rights specification activities can impose costs that are prohibitive relative to the net benefits from forests. However, in Sarawak, the

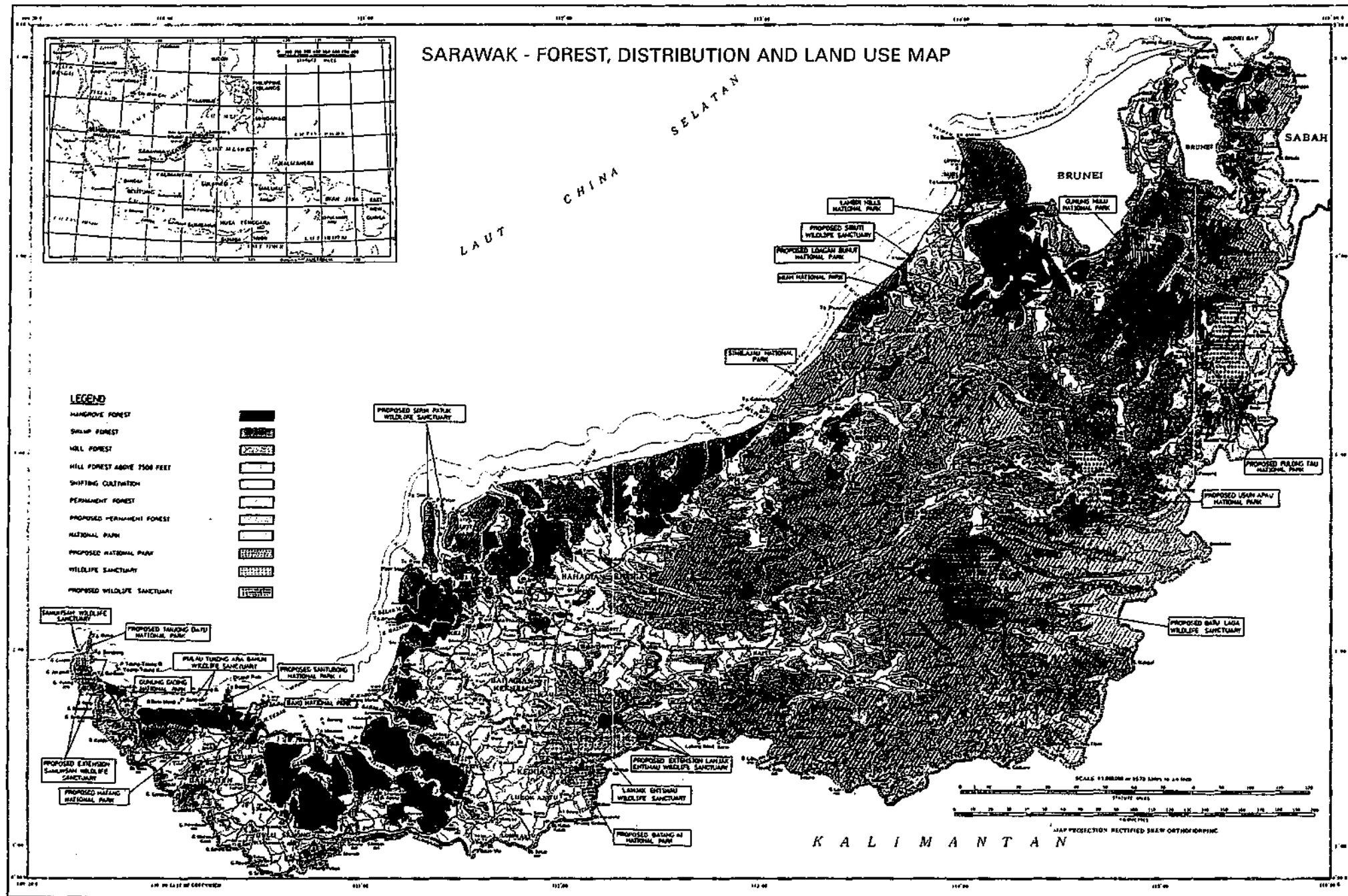
incomplete specification of forest property rights cannot all be attributed to costs, since specification costs appear to be less than the revenues derived from timber. Yet property rights have remained unspecified. This led to an examination of the political barriers (political costs and benefits) influencing property rights specification from a demand and supply perspective.

An increase in logging activities in the 1980s has made other non-timber functions scarcer and more valuable, and has motivated interest groups to demand a respecification of property rights to protect such functions. The effectiveness of demand by an interest group for property rights respecification is influenced by their size, network of links, number of years established, leadership skills, and the concentration of benefits. For the supply of property rights specification, the political benefits and costs faced by politicians and bureaucrats have been crucial in determining their willingness to supply changes in property rights. Rights have been specified by politicians and bureaucrats when specification directly enhanced their objectives of staying in power, or of increasing their administrative size, respectively. In Sarawak, the supply stance has tended to favour timber above other forest functions, although non-timber benefits have not been completely ignored insofar as demands by non-timber interest groups have affected the objectives of politicians and bureaucrats.

Logging has disrupted the *status quo* in forest use in Sarawak, and property rights have subsequently evolved as a result of actions by interest groups (demanders) and politicians and bureaucrats (suppliers). The study points to the importance of having to take into account information and incentives faced by politicians and bureaucrats in implementing and enforcing legislation, and the necessity for feedback and information from interest groups to enhance social coordination.

MAP 1





Chapter One

Introduction

1.1 Introduction: Statement of the Research Problem

The widespread concern about tropical forests is based on a number of issues: that these forests are disappearing at an alarming rate; that the loss of so much forest has potentially disastrous environmental effects -- on soil, water, climate, the genetic richness of the globe and the supply of future economic products; that the uses to which the land is being converted are often not sustainable -- that the forest in fact is being destroyed for no ultimate benefit, and that forest-dwelling people are being arbitrarily displaced. All of these are partly true, and to a greater or lesser degree in different parts of the world.¹

Forests have multiple functions and provide benefits to different sections of the community. This thesis examines and explains group conflicts arising from the use of tropical forests. Conflicts in forest use can range from that of interest groups expressing their concerns on the manner in which forests have been used, to that of blockades by native groups² in the late 1980s in retaliation for the impacts of logging on their livelihood. Forest functions refer to the various roles performed by forests, ranging from the supply of timber to the provision of abode for wild life and the indigenous peoples, the maintenance of watersheds and the environment, supply of non-timber forest products, and the preservation of biodiversity.

Being a multifunctional resource, the use of forests by one group for a particular benefit or function has entailed disagreements and disputes as the concerns of all groups interested in forests have not been taken into account. In this thesis, it will be argued that conflicts or disputes have arisen from a lack of social coordination in allocating forest functions among the various interest groups.

¹ D. Poore, "The Sustainable Management of Tropical Forests: The Issues" in S. Rietbergen, ed., *The Earthscan Reader in Tropical Forestry*. London: Earthscan Publications Ltd., 1993, p. 47.

² The use of the term 'native' may carry colonial connotations. However, Hong points out that indigenous people in Sarawak often refer to themselves as 'native', and are proud of being called such. Hence, the use of the term 'native' in this thesis is not meant to be derogatory but rather in line with what is conventional in Sarawak. See E. Hong, *Natives of Sarawak: Survival in Borneo's Vanishing Forests*. Malaysia: Institut Masyarakat, 1987, p. 2.

Social coordination in the use of forests requires that the full value of all forest functions be signalled by the market or political system. It requires that information about the value of each forest function and incentives to consider impacts of the use of one forest function on another function are fully taken into account by each user or interest group (as would be the case if all forest functions were priced and exchanged in markets). This would ensure that each group fully acknowledges the complete costs and benefits of their actions when making decisions on forest use.³ Interest groups then act in a manner consistent with the concerns of other groups interested in forests (as they experience all the consequences of their use of a particular forest function).⁴ Forest functions would then be allocated in a manner that considers the environmental, ecological, social, and economic impacts of their use, and they will be used in a socially optimal manner. The incomplete signalling of values, and inadequate incentives for the various interest groups to respond, results in a lack of consideration for the concerns of others, thus resulting in conflicts over forest use.

The outline of this chapter is as follows. A discussion of controversies arising from the use of tropical forests in general, and in Sarawak, continues below. Section 1.2 then provides a brief description of Sarawak in terms of its geography, history, political setting, and economy. Section 1.3 briefly discusses economic theories relevant to social coordination and conflicts. The hypotheses are then presented in Section 1.4 while the structure of the thesis is presented in Section 1.5.

- *Controversies in Tropical Forest Use*

Sarawak was selected for this study not because it represents the worst case of conflicts or disagreements arising from forest usage, but because research materials are available for investigation and testing specific to the purposes of this thesis. The forest use issues experienced in Sarawak are typical of those experienced in many other tropical forested areas.

³ This, however, will not occur because each group thinks only of the direct benefits it receives or the direct costs it incurs in using a resource and not the incidental benefits and costs going to other groups as a result of this group's actions. Such incidental benefits and costs have been termed externalities, and are discussed in more detail in Chapter Two.

What are the major controversies in tropical forest use? Identification of the common features in tropical forest use controversies provides a useful starting point from which to proceed and recognise specific issues that exist in Sarawak. Forest use controversies exist in many countries and areas containing tropical forests, like Brazil's Amazon, Indonesia, Thailand, Papua New Guinea, and the Philippines, and have been discussed in many studies (for example, Anderson, in Rietbergen, 1993; Broad, 1995; Burgess, 1989; Chase, 1993; Cleary and Eaton, 1992; Cooke, 1999; Dauvergne, 1993-94, 1997; Gunn, 1994; Hurst, 1990; Jepma, 1995). Controversies range from the destructive impact of logging on indigenous communities, distorted incentives created by the insecurity of timber leases, political connections of timber holdings and the attendant abuses, and a lack of consideration of the significance of non-timber benefits from forests. The precise causes of deforestation may differ from country to country but, as these studies illustrate, the use or "misuse" of forests has had a negative impact on certain groups in the community (for example, indigenous groups), while other groups have benefited from timber revenues and profits. .

In terms of controversies and disputes in forest use, Burgess (1989), Kummer (1992), and Panayotou and Ashton (1992) have identified some common features present in the use of tropical forests in Africa, Latin America, and the Asia-Pacific. Burgess (1989) points out that renewal of concessions is a very "chancy business", resulting in little security of tenure.⁵ This has also been supported by Dauvergne (1997) in a comprehensive study of forestry practices in Indonesia, East Malaysia, and the Philippines.⁶ Panayotou and Ashton (1992) report that typically, and very importantly, forest concessions awarded to concessionaires have insecure tenure and are non-transferable.⁷ In addition, concessions are often awarded on the basis of political rather than economic competitiveness.⁸ This

⁴ See I. Wills, *Economics and the Environment: A Signalling and Incentives Approach*. Australia: Allen and Unwin Ltd., 1997, chapter 2, for a discussion of social coordination in relation to environmental resources in general.

⁵ *ibid.*

⁶ P. Dauvergne, *Shadows in the Forest: Japan and the Politics of Timber in Southeast Asia*. Cambridge, Massachusetts: The MIT Press, 1997, pp. 166-169.

⁷ T. Panayotou, and P.S. Ashton, *Not by Timber Alone: Economics and Ecology for Sustaining Tropical Forests*. Washington, D.C.: Island Press, 1992, pp. 4-5.

⁸ See also Broad (1995) and Dauvergne (1993-94).

also finds support in Kummer (1992) whose study is on the Philippines but also points out that illegal logging in Thailand has been carried out by "people with political connections"; the extent is widespread but difficult to assess.⁹ Political connections have allowed the political, economic, and military elites in Indonesia and the Philippines to control timber extraction, and to derive disproportionate profits at the expense of the indigenous inhabitants of forested areas and also of the environment.¹⁰

In a survey of the concession system in Asia (Malaysia, Indonesia, and the Philippines), Burgess (1989) notes that forested areas are issued more through the will of politicians than the choice of the forest department officers: "[C]oncessions are valuable assets and in all cases encountered in this study they are disposed by politicians, generally without the advice of foresters."¹¹ In addition, the frequent disregard for native customary rights by concessionaires has in turn led to encroachment on concessions by members of the local community (Panayotou and Ashton, 1992). Another issue is the lack of consideration of the importance (or value) of non-timber forest products and services.¹² The final issue is the lack of consideration for the ecological and environmental functions of forests,¹³ which affects the interests of environmentalists and conservationists alike (Panayotou and Ashton, 1992).

These studies point out that conflicts in forest use are a common occurrence. They point to the need to examine the ways in which multifunctional forests benefit users and the manner in which forests are valued in public and private decision making. Importantly, the political costs and benefits behind forest use and property rights specification must be

⁹ D.M. Kummer, *Deforestation in the Postwar Philippines*. Chicago: The University of Chicago Press, 1992, p. 26.

¹⁰ R. Broad, "The Political Economy of Natural Resources: Case Studies of the Indonesian and Philippine Sectors", *The Journal of Developing Areas* 29, No. 3 (April 1995), pp. 321-322.

¹¹ P. Burgess, "Asia" in D. Poore, P. Burgess, J. Palmer, S. Rietbergen, and T. Synott, *No Timber Without Trees: Sustainability in the Tropical Forest*. London: Earthscan Publications Ltd., 1989, p. 131.

¹² The following non-timber products are important: "exudates (gums, resins, and latex); canes (rattan and bamboo) edible nuts, fruits, vegetables, and fungi; game animals and fish; flowers and fodder; and innumerable plants with biochemically active and useful substances, including those for medicinal and pharmaceutical uses, condiments, and spices."; Panayotou and Ashton, op. cit., p. 5.

¹³ Environmental and ecological functions include: "regulation of droughts and floods, control of soil erosion and sedimentation of downstream waterbeds, amelioration of climate, protection against weather damage, groundwater recharge, purification of air and water by acting as a "sink" for greenhouse gases (including carbon dioxide in logged forests if the timber extracted from them is not burned), conservation of

examined in conjunction with market forces. Such an approach will be undertaken in this thesis.

- *Forestry Situation in Sarawak*

In Sarawak, conflicts over forest use arose in the early 1980s and became more intense in the late 1980s. There are several studies of forest conflicts in Sarawak. Hong (1987) has studied forest use from a predominantly sociological-anthropological perspective, examining how natives have been affected by the logging industry, the construction of dams, and state agricultural schemes. This has in turn resulted in conflicts between the state and natives when native interests have been overlooked. Cooke (1999) focuses on the aspect of "activism" through representations made by forestry professionals and those of anthropologists, geographers, botanists, and agronomists. In doing so, Cooke points out how existing groups in power have attempted to exercise control over people through their ideologies and influence. Chala (1993) has focused on native land rights and the different forms of "resistance" organised by natives to state intrusion on their rights. As a result of the expansion of logging in recent decades, native groups have evolved from uncoordinated and reactive groups to reasonably cohesive lobby groups seeking outside alliances in their struggles to defend their rights. Hurst (1990), from a political science perspective, emphasises that the political conflicts that have arisen from forest activities are due to vested interests of the state in developing logging at the expense of non-timber production from forests, and ignoring the environmental, ecological, and social concerns about Sarawakian forests. Likewise, Dauvergne (1997) has approached the study of forests from the view that vested interests shared between politicians and timber operators have distorted state policies, weakened enforcement measures, and generated overharvesting of timber in Sarawak. In addition, the instability of political links between these groups has made concessionaires and timber companies harvest as much timber as possible before alliances crumble. Yap (1990) has examined the issue of deforestation from an economic geography perspective, describing the physical conditions of Sarawak and focusing on deforestation and conflicts to the non-complementary concerns of different interest groups.

genetic resource and biological diversity, and generation of recreational benefits and aesthetic values."; *ibid.*, p. 6.

These studies provide very useful discussions of the situation existing in Sarawak and of group interests in forestry conflicts. However, there is a need to examine the root causes behind conflicts arising from the use of forests.

It can be said that conflicts over forest use have arisen because different groups interested in different forest functions have contended that Sarawak's forests have been used in a manner that has not considered their interests in forests. Conflicting concerns over forest use have existed between loggers and natives, the state and environmentalists, the state and natives, Sarawak and developed countries, and to a lesser extent the state and conservationists. There appears to be incomplete signalling of forest function values and limited incentives to guide the allocation of forests in a manner which considers the concerns of all groups interested in forests. For example, environmentalists have stressed that logging in Sarawak has caused widespread pollution in rivers, soil erosion, floods, and river siltation. They assert that their concerns have been ignored by logging interest groups (Hong, 1987). Environmentalists have also pointed to the hardship and distress caused to native communities, because logging interest groups have ignored native rights and have destroyed many important non-timber forest products that are necessary for native subsistence.¹⁴ The government of Sarawak has emphasised the importance of income and employment benefits plus the government revenue that timber provides, from royalties and export levies. The government asserts that environmentalists have ignored Sarawak's overall developmental goal of achieving a diversified economic base of manufacturing, agriculture and services industries.

Native groups have contended that the government has overlooked their interests and favoured logging operations, ignoring native concerns for the sake of the development of the timber industry. As a result, natives have blockaded logging companies, resulting in widespread disruptions in timber operations in the late 1980s (Chala, 1993; Cleary and Eaton, 1992; Hong, 1987; ITTO, 1990). In turn, the state and the Forest Department have pointed out that illegal shifting cultivation has destroyed valuable timber and caused hardship because of a loss of jobs in the timber industry (Lau, 1979, 1982; Marajan and

¹⁴ see *The Battle for Sarawak's Forests*, Second Edition, Malaysia: World Rainforest Movement and Sahabat Alam Malaysia, 1990.

Dimin, 1989). It has also been asserted by the Forest Department that shifting cultivation by native groups has caused serious environmental impacts on soils (Lee, 1981) although this has been disputed by Cramb (1989), Hatch and Tie (1989), and Hong (1987). Conservationists, as a group, have stressed that more forested areas need to be preserved in Sarawak so that a representative collection of biodiversity habitats and wildlife can be protected (WWF, 1985; Kavanagh, Rahim, and Hails, 1989), and that the current progress in establishing and preserving areas for such purposes needs to be hastened by the state (ITTO, 1990). The International Tropical Timber Organization¹⁵ has expressed concerns about the excessive rates of timber extraction in Sarawak, and that excessive logging impacts on environmental and ecological sustainability by reducing the water catchment and erosion control roles performed by forests (ITTO, 1990).

Clearly, disputes (and unplaced concerns) have occurred and continue to occur because neither the market nor the political system has allocated forests in a manner that fully considers the concerns of all groups interested in forests. Problems in coordination arise when there is an absence of well specified property rights,¹⁶ which prevents clear value information and incentives from being imparted to the market or political decision makers to coordinate their use of forests.

1.2 Sarawak: Geography, History, Political Setting, and Economy

Sarawak, one of the thirteen states in Malaysia, lies along the north-west coast of Borneo. It is the largest state with a land area of approximately 12,445,000 hectares (ha). Of this area, 8,259,600 ha are forests. There are currently nine divisions in Sarawak (See Map 1 for the location of the various divisions, Map 2 for a more detailed breakdown of areas, and Map 3 for the types of forests in the various areas).¹⁷ Prior to 1987, Sarawak was divided into seven divisions, but since then two new divisions have been created: Samarahan which previously belonged to Kuching, and Bintulu which previously belonged to Sibul.

¹⁵ An association of timber producing and timber consuming developed and developing countries.

¹⁶ Rights that are clearly defined and fully enforced in terms of the right to use, the right to derive income, the right to exclude, and the right to transfer. The importance of well specified property rights will be discussed in greater detail in Section 1.3 of this chapter and in Chapter Two.

¹⁷ Divisions are termed "Bahagian" in the Malay language.

Natural forests in Sarawak comprise hill forests (7,024,085 ha), peat swamp forests (1,242,437 ha), and mangrove forests (167,908 ha).¹⁸ Of these natural forests, 4,412,762 ha have been constituted as Permanent Forest Estates and the rest are Stateland Forests. Permanent Forest Estates consist of Forest Reserves, Protected Forests, and Communal Forests. The first two sub-categories are reserved mainly for commercial timber harvesting, while the third is reserved for the benefit of native groups. Permanent Forest Estates are designated as productive forests supplying timber and other forest products in perpetuity for the benefit of all Sarawakians. State land Forests consist of 3,732,900 ha of natural forests and are forested areas where either conversion into a Permanent Forest Estate is yet to be formally established through a title, or areas destined to be converted to non-forest purposes like commerce, agriculture or industry.

Information on forested and other lands, as at the end of 1995, is provided in the Table 1.1 below:

Table 1.1: Land Areas and Percentage Forested as at December 1995

Division	Land Area (ha)	Forested Area (ha)	% Forested
Kuching	4,566	1,639	35.9
Sri Aman	9,647	3,555	36.9
Samarahan	4,961	1,999	40.3
Sibu	12,887	6,297	48.8
Sarikei	6,721	2,646	39.4
Kapit	38,934	32,984	84.7
Miri	26,777	20,766	77.6
Limbang	7,790	5,588	71.7
Bintulu	12,166	8,628	70.9
Total	124,449	84,084	67.7

Source: *Annual Report of the Forest Department 1995, Sarawak.*

Sarawak has just under nine percent of the total population of Malaysia. Its population density is the lowest in Malaysia, averaging thirteen persons per sq km. As at end 1995, the population of Sarawak stood at 1.86 million.¹⁹ The native people, or 'Dayak',²⁰ constitute the

¹⁸ *Annual Report of the Forest Department 1993, Sarawak.*

¹⁹ *Agricultural Statistics of Sarawak 1995.* Malaysia: Department of Agriculture Sarawak, 1996.

largest grouping in the state; around 40 percent of the total Sarawakian population. Of the rest, the Malay make up 20 percent, Melanau 6 percent, and Chinese 29 percent of the total population. At the end of 1991 (the latest statistics on native groups available), more than eighty percent of Sarawak's then 1.72 million population lived in rural areas.²¹ Table 1.2 provides information on population distribution by ethnic group; the Iban comprising the majority in the native grouping.

Table 1.2: Population and Population Distribution by Ethnic Group ('000 and Percent)

Ethnic Group	1960	1970	1980	1990
Malay	129 (17.4%)	181 (18.6%)	258 (19.7%)	348 (20.8%)
Melanau	45 (6.0%)	53 (5.5%)	75 (5.7%)	96 (5.8%)
Iban	238 (31.9%)	303 (31.1%)	396 (30.3%)	493 (29.5%)
Bidayuh	58 (7.7%)	84 (8.5%)	108 (8.2%)	140 (8.4%)
Other Indigenous	38 (5.1%)	51 (5.2%)	69 (5.3%)	91 (5.5%)
Chinese	229 (30.8%)	294 (30.1%)	385 (29.5%)	483 (28.9%)
Others	8 (1.1%)	10 (1.0%)	17 (1.3%)	19 (1.1%)
Total	745	976	1308	1670

Source: Annual Statistical Bulletin Sarawak, 1991

²⁰ In the Malaysian Constitution, the Dayak previously comprised two native groups: the Iban or Sea Dayak, and the Bidayuh or Land Dayak. In mid-1987, the term Dayak was modified to refer to all native groups; T. Chala, *Development and Change in Sarawak: An Analysis of a Conflict*. Unpublished Master of Arts Thesis (Geography Department), University of Melbourne, June 1993, p.4.

²¹ P.S. Morrison, "Notes: Transitions in Rural Sarawak: Off-Farm Employment in the Kemena Basin, *Pacific Viewpoint* 34, No. 1 (May 1993), p. 46.

Table 1.3 indicates 1980's ethnic distribution following the new divisions created after 1987.

Table 1.3: Ethnic Distribution by Division, 1980.

Division	Iban	Bidayuh	Orang Ulu	Malay	Melanau	Chinese
Kuching	21,648 (5%)	64,673 (60%)	1,448 (2%)	119,990 (47%)	1,545 (2%)	153,540 (40%)
Sri Aman	99,595 (25%)	576 (1%)	128 (neg.)	46,303 (18%)	421 (1%)	18,628 (5%)
Sibu	76,131 (19%)	615 (1%)	873 (1%)	16,004 (6%)	34,293 (46%)	96,711 (25%)
Miri	43,797 (11%)	1,214 (1%)	32,907 (48%)	24,106 (9%)	5,201 (7%)	41,582 (11%)
Bintulu	29,812 (8%)	142 (neg.)	3,189 (5%)	3,940 (2%)	8,224 (11%)	11,867 (3%)
Sarikei	47,902 (12%)	312 (neg.)	168 (neg.)	8,303 (3%)	24,773 (33%)	37,025 (10%)
Kapit	48,475 (12%)	124 (neg.)	12,039 (17%)	1,392 (1%)	422 (1%)	4,360 (1%)
Samarahan	22,130 (6%)	39,747 (37%)	88 (neg.)	24,390 (10%)	86 (neg.)	14,686 (4%)
Limbang	6,790 (2%)	146 (neg.)	18,225 (26%)	12,836 (5%)	161 (neg.)	6,792 (2%)
All Divisions	396,280	107,549	69,065	257,804	75,126	385,161

Source: Cited in Jawan, 1994

Up to the 1990s, over eighty percent of natives lived in the interior of Sarawak and were dependent of forests for their subsistence and livelihood (Morrison, 1993). It is in these rural areas where conflicts have emerged between native groups and logging companies.

Time and precedence have influenced present day policies and legislation of the state. Before 1841, Sarawak was under the rule of the Sultan of Brunei. From 1841 to 1941, it then became the private colony of the Brooke family. The Brookes established a modified form of British land law in Sarawak. Much of the present day forest and land legislation is based upon the laws promulgated during the Brooke period. Traditional land tenure arrangements were preserved as far as possible with an implied claim by the state in all

public lands including forests and "unoccupied" waste lands.²² This has continued right up to present times (Hong, 1987).²³ In 1946, after the Japanese occupation, Sarawak was ceded to Britain and remained a crown colony until 1963, when it became part of Malaysia.²⁴ British rule imparted a major part of the legislation encompassed in the present day Land Code and Forest Ordinance of Sarawak.

Malaysia operates under a system roughly based on the principles of parliamentary democracy,²⁵ with the management of natural resources controlled by the Sarawakian state government, not the Federal Government at Kuala Lumpur. There are three branches of government within Sarawak governing the use of natural resources which includes forestry: the Legislative (which enacts and changes laws and ordinances), the Executive (consisting of the various ministries that enforce the legislative mandate set by legislature), and the Judiciary (which upholds the laws of the state). The Sarawak Forest Department oversees the overall management and conservation of Sarawak's forest resources including timber. Details on the 'operationalisation' of forest policies, and the Sarawakian political system will be provided in Chapters Four and Six respectively of this thesis.

During the period under study, Sarawak's economy was predominantly agricultural and rural-based, and this remains true up to today. Table 1.4 provides area and land use by division, highlighting the extensive use of lands by shifting cultivation (Crop Land) and forestry (Swamp Forest and Dry Land Forest) in Sarawak.

²² *ibid.*.

²³ This insecurity of land tenure will be discussed in detail in Chapter Four of this thesis.

²⁴ R.A. Cramb, and G. Dixon, "Development in Sarawak: An Overview" in R.A. Cramb, and R.H.W. Reece, eds., *Development in Sarawak: Historical and Contemporary Perspectives*. Australia: Centre of Southeast Asian Studies (Monash University), 1988, p. 2.

²⁵ This *modus operandi* is an adaptation and modification of the system of democratic rule passed down from the British colonial period.

TABLE 1.4: Area and Land Use by Division: 1991 ('000 hectare)

Land Use Classes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Total
Settlement and Assoc. Non-Agri Lands	8.4	4.2	1.8	5.1	6.7	0.9	1.5	0.6	6.7	36.0
Horticultural Lands (mainly Misc. cultivation and incl. small areas of fruit trees)	12.2	11.7	8.4	6.3	3.6	0.8	2.4	0.3	1.0	46.8
Tree Palm and Other Permanent Crops (Rubber, Sago, Oil Palm, Coconut and Pepper)	29.2	28.3	42.9	45.5	38.7	7.4	35.2	5.1	15.5	247.7
Crop Land (Wet Padi and Hill Padi)	234.7	220.8	540.2	529.5	634.4	209.8	382.8	630.4	325.0	3707.6
Unused Land (Sheet Lalang and Other Secondary Growth)	2.6	12.5	10.1	11.0	4.6	4.3	7.9	0.1	10.1	63.4
Swamp Forest (Mixed Swamp Forest, Alan and Padang Paya)	2.8	120.4	222.9	395.8	287.9	15.3	128.2	0.5	88.4	1262.2
Dry Forest Land (Hill Forest, Kerangas, Riverine Forest, Beach Forest)	120.3	71.8	105.7	257.9	1680.2	523.6	63.5	3255.8	743.8	6822.6
Swamp (Paya) (incl. fresh and salt water and mangrove and nipah)	33.8	2.4	12.5	10.8	2.4	11.3	65.7	0.0	0.1	139.0
Total Land Use Classes	444.0	472.1	944.6	1262.0	2658.5	773.3	687.2	3892.9	1190.7	12325.3

(1) Kuching (2) Samarahan (3) Sri Aman (4) Sibn (5) Miri (6) Limbang (7) Sarikei (8) Kapit (9) Bintulu

Source: *Agricultural Statistics of Sarawak 1995*, Malaysia: Department of Agriculture Sarawak.

Table 1.5, which complements Table 1.4, indicates the changing nature of land use in Sarawak between 1976 and 1991. Major changes include increases in the land used for shifting cultivation, and reductions in areas of hill forest land. The continuing importance of shifting cultivation, and of the existing potential for logging in Sarawak is also indicated in Table 1.5. The table also illustrates the large areas of shifting cultivation that could be used for commercial timber production and agricultural schemes, which does not bode well with the concerns of native groups.

Table 1.5: Land Use: 1976 and 1991

Land Use Classes	1976		1991	
	Sq. Km.	%	Sq. Km.	%
Settlement and Associated Non-Agricultural Land	151.8	0.12	359.6	0.29
Horticultural Lands (Mainly Misc. Cultivation and Incl. Small Areas of Fruit Trees)	83.7	0.07	468.2	0.38
Tree, Palm and Other Permanent Crops Consisting of:	3,026.1	2.45	2,447.6	2.01
- Rubber	2,033.9	1.65	1,449.0	1.18
- Oil Palm	189.3	0.15	309.2	0.25
- Coconut	408.7	0.33	433.6	0.35
- Pepper	236.5	0.19	114.4	0.09
- Sago	157.7	0.13	171.4	0.14
Crop Land (Padi) Consisting of:	28,945.6	23.49	37,091.7	30.09
- Wet Padi	417.0	0.34	558.6	0.45
- Shifting Cultivation	28,528.6	23.15	36,533.1	29.64
Unused Land (Secondary Growth)	724.2	0.59	633.7	0.52
Swamp Forest Consisting of:	13,837.1	11.22	12,627.0	10.24
- Mixed Swamp Forest	10,839.7	8.79	9,717.7	7.88
- Alan	2,409.0	1.95	2,335.3	1.89
- Padang Paya	588.4	0.48	574.0	0.47
Dry Forest Land Consisting of:	74,801.9	60.69	68,204.9	55.34
- Hill Forest	71,529.8	58.04	65,068.5	52.79
- Kerangas Forest (Tropical Heath)	2,973.8	2.41	2,869.5	2.33
- Riverain Forest	289.8	0.23	258.9	0.21
- Beach Forest	8.5	0.01	8.0	0.01
Swamp (Paya) (incl. fresh and salt water and mangrove and nipah)	1,682.5	1.37	1,390.2	1.13
Total	123,252.9	100.00	123,252.9	100.00

Source: Annual Statistical Bulletin Sarawak, 1991

Table 1.6 indicates that around ten percent of the labour force is employed by the forestry sector, and this trend has more or less been maintained throughout the whole period under study. The importance of primary products in the composition of exports from Sarawak is indicated in Appendix 1.1: timber comprised over 30 per cent of total exports from Sarawak from the 1980s to mid 1990s, second to petroleum which is the main source of exports.

Table 1.6: Population Aged 15-64 by Industry: 1991

Industry	Total Employed	% of Total Labour Force
<i>Employed Group Consisting of:</i>	<i>592,952</i>	<i>91.41</i>
Agriculture and Livestock Production	206,729	31.87
Agricultural Services	712	0.11
Fishing	8,922	1.38
Hunting, Trapping and Game Propagation	46	0.01
Forestry	624	0.10
Logging	64,686	9.97
Mining and Quarrying	4,988	0.77
Manufacturing	50,529	7.79
Electricity, Gas and Water	3,997	0.62
Construction	40,767	6.28
Wholesale and Retail Trade, Restaurant and Hotels	63,824	9.84
Transport, Storage and Communication	18,290	2.82
Financial, Insurance, Real Estate and Business Services	13,164	2.03
Community, Social and Personal Services	110,634	17.06
Others	5,040	0.78
<i>Unemployed Group</i>	<i>55,702</i>	<i>8.59</i>
<i>Total Employed and Unemployed</i>	<i>648,654</i>	<i>100.00</i>
<i>Outside Labour Force and Unknown Labour Force Status</i>	<i>323,031</i>	
<i>Total</i>	<i>971,685</i>	

Source: *Agricultural Statistics of Sarawak* 1995. Malaysia: Department of Agriculture Sarawak.

Table 1.7 provides information on the percentage share of GDP, by industry, for the years 1981 and 1990.

Table 1.7: Sarawak Percentage Share of GDP by Industry - 1981 and 1990

Industry	1981 (Percentage Share)	1990 (Percentage Share)
Agriculture, Livestock, and Fishery	12.8	9.3
Forestry and Logging	12.9	14.8
Mining and Quarrying	29.6	32.8
Manufacturing	6.5	13.0
Construction	5.9	3.3
Wholesale and Retail	8.4	7.5
Transport, Storage, and Communication	3.8	4.8
Social, Personal, and Other Services	20.1	14.5

Source: Bugo (1995)

Revenues from forestry (royalties, premiums, export duties, etc.) comprised nearly 50 percent of total state revenue in 1990 (Bugo, 1995). Figures available in Bugo show that timber provided on average 47 per cent of the state revenue for the years 1988-1991.²⁶ Notably, Sarawak is permitted to keep all royalties and taxes on output, income, and dividends from timber, which is very important for funding the development and infrastructure of the state. By contrast, in the case of petroleum, only a royalty of 5 percent on the gross value of output can be kept by the state; other taxes and royalties accrue to the Federal government. Revenues obtained by Sarawak from timber and petroleum are provided for comparative purposes in Table 1.8 below.

²⁶ H. Bugo, "The Significance of the Timber Industry in the Economic Development of Sarawak", in R.B. Primack, and T.E. Lovejoy, eds., *Ecology, Conservation, and Management of Southeast Asian Rainforests*. New Haven and London: Yale University Press, 1995, p. 236.

**Table 1.8: Sarawak: State Government Revenues from Forestry and Petroleum
(Selected Years) (RM million)**

	1964	1970	1975	1985	1990
Forestry (Includes Export Duties)	5.9	19.4	132.7	336.1	703.5
Percentage of Total Revenue	6.4	22.4	33.0	35.8	48.0
Petroleum	0.3	2.5	116.0	204.9	200.0
Percentage of Total Revenue	0.3	3.0	28.9	21.8	13.6

Source: Wee (1995).

Summarising, several features of Sarawak's geography, population, and economy are important for the analysis which follows. First, forested areas cover major parts of Sarawak. Second, Sarawak's population is predominantly rural based. Third, shifting cultivation is a very important activity in Sarawak, with native groups dependent on forests for their livelihood and subsistence. Fourth, timber revenues are crucial for the developmental goals and aspirations of the state, and around ten per cent of the population is employed by this industry. Fifth, state revenue has always depended heavily on timber and therefore the control of land rights.

1.3 Social Coordination, Property Rights and Public Choice Approaches to Forest Use and Conflicts

The concept of social coordination stems from Hayek (1945), and has been extended in a systematic and detailed manner to analyse the allocation of environmental resources by Wills (1997). Social coordination will be discussed in greater detail in Section 2.2 of Chapter Two. Briefly, it involves the use of resources in a manner which takes into account the concerns of all users of a particular resource.

In this thesis, the analysis of social coordination of forest land use is based on two topics in the economic theory of institutions. The first is the economic theory of property rights and transaction costs, and the second is the economic theory of public choice.

The economics of property rights and public choice do not assume a world of costless definition and enforcement of property rights, or complete information, and of altruistic public decision making, as sometimes assumed in neoclassical economic analyses. Such

an idealised world would indeed result in perfect social coordination. The prerequisites for the market and/or political decision processes to coordinate the use of all forest functions are complete information about the demand for, and supply of, all attributes, communication of the full impacts of forest use to all users, and incentives for all users to respond to the desires of others, all based on clearly defined and enforced property rights for all functions. This would mean that each user would be fully aware of his/her impacts on others, and vice versa. All effects (costs and benefits) of the use of each forest attribute would be internalised by forest users because others' rights would be costlessly defined and enforced. In this situation, markets or political processes could coordinate the allocation of forest attributes in a manner that considered the interests of all forest users. Allocation would then be optimal in a sense that no one group could be made better off by a change in the allocation of forest function use without making another group worse off, and conflicts would be non-existent, if all users recognised the legitimacy of commonly agreed forest property rights.

However, this ideal does not exist in the real world. The use of property rights and public choice theories is based on the belief that recent theoretical developments in these areas of economics help to provide a more systematic and rigorous explanation of actual behaviour and political-economic interactions in the allocation of multifunctional forest resources.

Social coordination requires the signalling of values and incentives to respond to the concerns of others.²⁷ The basic prerequisite is the existence of clearly defined and enforced property rights. In this thesis, the focus is on the coordination of the use of multifunctional forest resources with different functions being valued differently by the various interest groups, and a consequent need to coordinate the use of forest functions among the various groups. Unless an individual or group holds the rights to a particular forest function, and unless rights are exclusive, enforced, and can be transferred or traded among the various interest groups, information on the value of forest functions and incentives to consider the interrelated impacts of the use of one forest function on other forest functions will not be present.²⁸ This leads to the emphasis on an examination of the definition and enforcement of property rights for each forest function, and focuses the analyses in this thesis on what

²⁷ *ibid.*, p. 17.

²⁸ This aspect will be discussed in detail in the section of property rights in Chapter Two.

is arguably the root cause of a lack of coordination: the absence of defined and enforced property rights for some forest functions in Sarawak.

Coordination in the use of forests cannot be perfect due to costs associated with the activities involved in specifying property rights in forest functions. The specification of rights involves activities that are costly: costs of defining, monitoring, and enforcing rights to each forest function, and of penalising offenders who violate these rights. Clear specification of rights is essential for social coordination. If the costs of these activities are too high, there will be no precise property rights, resulting in incomplete social coordination. Precise specification may be infeasible, due to the trade-off between the coordination benefits of a complete specification of rights and higher costs associated with this specification. These issues are discussed at length in Section 2.3 of Chapter Two.

The state supplies the definition and enforcement of property rights. Thus the specification of property rights is also dependent on the political choices made by politicians and bureaucrats (Libecap, 1989). Even if the benefits of well specified rights exceed their expected costs, politicians and bureaucrats may choose to have certain rights unspecified. Public choice theory will be used to explain the economic rationale behind such actions.

Public choice theory is an extension of neo-classical economics into politics (Mueller, 1989, 1997). Among other matters, it emphasises the need to look at the incentives and information behind decisions made by politicians and bureaucrats (suppliers of property rights specification), in response to collective action by the various interest groups (demanders of property rights specification). Planners' incentives and information help to determine whether the planner will maintain the *status quo* in the definition and enforcement of rights, or act to change the current definition and enforcement of property rights. Planners' decisions on rights definition and enforcement determine what property rights exist, which in turn determine incentives faced by groups interested in forests, which in turn affects conflicts over forest use.

This combination of property rights and public choice analyses serves to explain forest use conflicts by linking the physical characteristics of forested areas and forest values, to the economic and political factors determining forest use.

1.4 Hypotheses

The analysis of forest resource use and the resulting conflicts is based on three hypotheses. The first hypothesis concerns the inability of the market or political process to coordinate the allocation of forest functions among interest groups. Coordination is lacking, first, because neither the market nor the political process incorporates information about all forest function values, and neither provides sufficiently comprehensive incentives to the interested parties, to allow the concerns of all groups to be included and traded-off in decision making. This is so because property rights to each forest function have not been clearly defined and enforced. The resulting lack of coordination leads to conflicts among the various interest groups.

Why is information about the values of some forest functions and incentives to respond to other groups' concerns lacking? The second hypothesis is that the inherent characteristics of forests make it too costly to completely define and enforce property rights to forest functions, in order to signal information about the values of these functions, and to create incentives for forest users to consider their values by other groups interested in forests.

Alternatively, specification costs may not be too high, but the political costs and benefits faced by state planners cause them to define and enforce property rights in ways which fail to take account of all interest groups' concerns. This forms hypothesis three of this thesis.

1.5 Structure of Thesis

A review of the economics of institutions as it relates to disputes over the use of multifunctional forests is undertaken in Chapter Two. In particular, Chapter Two will focus on the role of property rights and transaction costs in allocating resources. It will explain how the intrinsic characteristics of non-excludability and non-rivalry of some forest resources create high costs of defining and enforcing property rights and of transactions. This explains why it may be too costly for coordination of forest resource use

to always take place. Chapter Two also reviews public choice theories which examine interactions between the state and the various interest groups. Chapter Two concludes with a discussion of the analytical framework and data sources used in this thesis.

Chapters Three to Six use empirical data to test the hypotheses. In Chapter Three, forest functions deemed important in Sarawak are identified. It is necessary that forest functions be identified, for it is the multiplicity of functions, and the lack of social coordination in allocating these functions among the various interest groups, that has led to disputes and conflicts over forest use. Forest property rights have to be clearly defined and enforced for each forest function before social coordination can occur; Chapter Four examines the extent to which rights have, or have not, been clearly defined and enforced for each forest function identified to be of importance in Sarawak. The costs of defining and enforcing rights will be discussed in Chapter Five. Chapter Six examines the interaction between the various interest groups (demanders of property rights) and politicians and bureaucrats (suppliers of property rights) in the political determination of property rights. Chapter Seven summarises the main findings, notes the limitations and contribution of this research, and suggests some practical implications of this research for forest management.

Chapter Two

Economic Analyses of Failures of Coordination in Forest Use

2.1 Introduction

As discussed in Chapter One, complete social coordination can only occur if the values of all forest functions are signalled, and when all parties interested in forest allocation have incentives to consider the concerns of other interested parties. It is therefore necessary to begin with a review of the concept of social coordination as discussed by economists, and explanations offered for the lack of coordination in allocating scarce resources among users. These topics are discussed in Section 2.2.

Clearly defined and enforced property rights are crucial for social coordination.¹ The term "specification" is used to include both the definition and enforcement of property rights. Section 2.3 reviews the economics literature on property rights and justifies its importance for examining conflicts. Section 2.3.1 narrows down the discussion to the importance of a clear specification of property rights in coordinating resource allocation. Complete social coordination by market or politics may be hindered by the costs of defining and enforcing private or public property rights. The economic barriers presented by such costs are discussed in Section 2.3.2.

Besides economic barriers in specifying rights, the definition and enforcement of property rights is also affected by the behaviour of political decision makers, and by collective action undertaken by interest groups. The incentives and information behind decisions made by politicians and bureaucrats in response to collective action by interest groups help to determine the manner which rights are defined and enforced. Such aspects are discussed in Section 2.4. Section 2.4.1 discusses literature on collective action and lobbying by interest groups (demand side). Section 2.4.2 examines literature on the role of political decision makers in specifying property rights (supply side).

¹ See I. Wills, *Economics and the Environment: A Signalling and Incentives Approach*. Australia: Allen and Unwin Ltd., 1997, chapter 2, for a discussion of social coordination in relation to environmental resources in general.

Section 2.5 reviews the literature on management of multifunctional forests, linking it to the preceding discussions of social coordination. An analytical framework for examining conflicts in resource use is presented in Section 2.6. Section 2.7 then details the research methodology and data sources.

2.2 Economic Theories Explaining Social Coordination

The idea of social coordination in this thesis can be traced to Hayek (1945), although the term "social coordination" was not used in Hayek's discussion (the term "coordination" was used). Rather, the term "social coordination" originates from Wills (1995-96, 1997). The main difference between Wills and Hayek is that Wills explicitly points to the importance of both prices and values in guiding allocation, whereas Hayek refers only to prices as the guiding mechanism. Values generated outside the domain of markets through politics can be signalled through procedures like voting, lobbying, and other similar actions. The concept of social coordination is central to this study, as it incorporates the axiom of rationality, and uses economic tools to analyse market and political motivations involved in the allocation of forest functions.

What does coordination entail? According to Hayek (1945), the efficient use of resources in any economic system² is dependent on how a particular system utilises existing dispersed knowledge (information) in decision making, and how such knowledge can be used by individuals to fit their plans with others. In markets, the communication of such dispersed knowledge is performed by the price system which is crucial in allocating resources efficiently. Indeed, this forms the central theme of Hayek's (1945) paper.³ In Hayek's words:

Fundamentally, in a system where the knowledge of the relevant facts is dispersed among many people, prices can act to coördinate the separate

² Hayek points out that there are three systems of coordination: allocation undertaken on a unified basis (central planning), decentralised basis (planning by many individuals), or monopoly (planning by few organised industries); F.A. Hayek, "The Use of Knowledge in Society", *The American Economic Review* XXXV, No. 4 (September 1945), pp. 520-521.

³ *ibid.*, p. 525.

actions of different people in the same way as subjective values help the individual to coördinate the parts of his plan.⁴

Prices guide the use of resources by communicating knowledge (information) about the scarcity or abundance of a resource, and this in turn motivates and provides incentives for individuals to adjust their activities accordingly. This dissemination of information through prices results in coordination, therefore securing the most efficient use of resources.⁵ Complete coordination assumes that all resources can be priced, and changes in prices coordinate changes in economic activities in response to incentives, which in turn ensures that overall allocation takes place in an orderly manner.

Applying this ideal situation of coordination to the allocation of forest functions, shifts in demand or supply of one forest function will be communicated to other groups through price changes. This leads to incentives by all groups interested in forests to adjust activities, in the light of price changes in that particular forest function. The use of the various forest functions is coordinated as a result of changes in the prices which are signalled in markets. Price changes communicate shifts in the interdependence among users sharing the same forests, thus providing incentives for forest beneficiaries to modify their behaviour.

The above emphasis on prices, however, leads to a very important point: not all forest functions can be priced because of the intrinsic characteristics of some forest functions (discussed later in this section). Without prices for some forest functions (and some environmental resources), it may be impossible to coordinate the allocation of forest functions leading to the observed conflicts in Sarawak.

Building on the Hayekian theme, Anderson and Leal (1991) stress the importance of markets (and prices) in resource allocation. Prices transform "subjective values into an objective measure"⁶ providing for an easy comparison of alternative uses. Market failures in the allocation of environmental resources result when complete benefits are not captured

⁴ *ibid.*, p. 526.

⁵ *ibid.*, pp. 526-527.

⁶ T.L. Anderson, and D.R. Leal, *Free Market Environmentalism*. Boulder: Westview Press, 1991, p. 18.

or complete costs are not borne by decision makers, when prices do not exist for such resources. Externalities or unpriced effects on third parties are then said to result.

Political coordination is sometimes seen as a remedy for market failure. However, Anderson and Leal point out that the 'externalising' of costs also occurs in political decision making: a political decision maker considers values that the political process makes him or her recognise, and does not necessarily face all opportunity costs of a decision.⁷

Echoing Hayek but adding more depth into the concept of coordination, Wills (1995-96, 1997), explains conflicts over the use of environmental resources as results of failures of "social coordination" between people.⁸ Wills (1997) attributes the idea of social coordination to Hayek (1945) and crystallises Hayek's ideas in the following manner:

Hayek explains that markets and government planning are alternative systems for coordinating people's use of resources. The effectiveness of coordination depends on the ability of each system to signal accurately information about people's wants and available supplies of resources, and on the incentives each provides for individuals to respond to the desires of others.⁹

Importantly, Wills points to the need to examine individual decision makers' information, about resource uses values, and decision makers' incentives in both markets and politics.¹⁰ In particular, the intrinsic characteristics of environmental resources can cause imperfect information and therefore 'mispricing' of resource values, and lead therefore to distorted incentives for private or public decision makers.

Social coordination is affected by one or more of three main signalling and incentive systems: traditions, central planning, and markets.¹¹ Generally a mixture of systems exists

⁷ *ibid.*

⁸ Wills, 1997, *op. cit.*, pp. viii, 5-6, and 17-20.

⁹ *ibid.*, p. vii.

¹⁰ *ibid.*, pp. viii and 6.

¹¹ For traditions, signals are instilled as part of the culture (for example, native customs); for central planning, information is collected by a central planner and production and consumption plans administered from this body together with a system of incentives (rewards and penalties) designed to promote adherence to plans and to maximise community benefits; for markets, signalling of value and incentives is entirely

with property rights vested in individuals, the community, and the state;¹² this seems to be an accurate portrayal of the situation which exists in the real world. Central planning and market systems predominate; rights are commonly defined and enforced by the state or its representatives (Wills, 1995-96).¹³ This in turn narrows the focus of definition and enforcement activities to the role played by the state in specifying rights.

Incentives vary with the economic system. In a market system, "property rights provide direct incentives to use resources to the advantage of others."¹⁴ In other words, the "people who make production and consumption decisions are the same people who provide value information and reap the rewards and penalties of those decisions."¹⁵ For the state, incentives for government planners exercising property rights are less direct: for example, "more or less votes and funds at the next election, or more or less rapid promotion within the bureaucracy."¹⁶ Politicians and bureaucrats make decisions that are separate from those of producers and consumers; as Wills points out: "planning outcomes may be affected by the incentives of a third group, the planners, who have no direct interest in particular production and consumption outcomes."¹⁷ Thus it is not clear that planners aim to "maximise community benefits"¹⁸ from production and consumption activities. Social coordination by politics involves less clear incentives and information, and hence a higher possibility of conflicts over resource use, than coordination by markets.¹⁹ The role of public decision makers in property rights specification will be discussed in greater detail in

dependent on market forces (demand and supply) and responses by decision makers aimed at maximising their own returns; *ibid.*, p. 25.

¹² For traditional systems, rights normally belong to the community or individuals within the community; for central planning, rights are divided between planners and individuals who obtain rights from the state; for markets, individuals have exclusive rights to the use of resources; *ibid.*, pp. 25-27.

¹³ I. Wills, "Environmental Problems", *Policy* 11, No. 4 (Summer 1995-96), p. 59.

¹⁴ *ibid.*

¹⁵ Wills, 1997, *op. cit.*, p. 42.

¹⁶ *ibid.*

¹⁷ *ibid.*, p. 42

¹⁸ *ibid.*, p. 43.

¹⁹ Wills points out that signalling of values is not so reliable for central planning. Unlike prices in the market system, which are determined by demand and supply, consumer and producer values in central planning are signalled by: "voting, opinion polling, lobbying by organised groups, creation of new political movements, direct action by individuals or informal groups (such as visiting or writing to politicians, writing letters to the editor, joining demonstrations and making political contributions), and indirect responses such as disobeying laws or moving to another state or country." However, the values thus signalled to the central planner may be distorted, either deliberately or because not all interested parties find it worthwhile (costs of signalling values by non-market methods for some groups exceeding benefits of signalling in some instances) to signal these values. See *ibid.*, p. 44

Section 2.4, which deals with public choice theory. Public choice theory, like neoinstitutional economics, is a subset of New Institutional Economics (NIE) (Drobak and Nye, 1997).

2.3 Property Rights and Social Coordination

The signalling of information about values and the provision of incentives is governed by the prevailing structure of property rights specification in resources. Property rights guide the allocation of resources (Cheung, 1970, 1974; Coase, 1960; Demsetz, 1964, 1966, 1967; Eggertsson, 1990a, 1990b; Furubotn and Pejovich, 1972; Libecap, 1989; Schmid in Bromley, 1995) and hence provide the means of resolving conflicts in resource allocation (Wills, 1997). The importance of property rights in influencing behaviour has been overlooked in traditional neoclassical economic literature. As De Alessi (1983a) points out, in trying to develop more rigorous economic theories, economists have abstracted from the complexities of the real world and focused on the behaviour of idealised variables under "highly purified conditions".²⁰ Economists have also "gradually eliminated all institutional constraints from consideration."²¹ The tendency of traditional theory to exogenise property rights and assume zero transaction costs may have generated useful analyses but "it does have the effect of narrowing the range of phenomena that can be explained."²²

2.3.1 Specification of Property Rights and Economic Behaviour

Why are property rights important for resource allocation? Property rights influence the manner in which individuals utilise resources. Elaborating from Furubotn and Pejovich (1972):

Property rights assignments specify the norms of behavior with respect to things that each and every person must observe in his interactions with other persons, or bear the consequences of his non-observance. The prevailing system of property rights in the community can be described,

²⁰ L. De Alessi, "Property Rights and Transaction Costs: A New Perspective in Economic Theory", *Social Science Journal* 20, No. 3 (July 1983a), p. 59.

²¹ *ibid.*

²² E.G. Furubotn, and S. Pejovich, "Property Rights and Economic Theory: A Survey of Recent Literature", *The Journal of Economic Literature* X, No. 4 (December 1972), p. 1141.

then, as the set of economic and social relations defining the position of each individual with respect to the utilization of scarce resources. ...

Consequently, a change in the general system of property rights must affect the way people behave and, through this effect on behavior, property rights assignments affect the allocation of resources, composition of output, ... etc.²³

In other words, property rights in resources sanction particular types of behaviour by individuals in the use of scarce resources, while outlawing other forms. The role of property rights in coordination is well stated by Furubotn and Pejovich's (1972): "that the content of property rights affects allocation and the use of resources *in specific and predictable ways*." [italics present in original text]²⁴

Clearly defined and fully enforced property rights are a crucial condition for orderly behaviour, and for reducing conflicts that can arise from the use of a resource. In the context of this thesis, the specification of property rights influences the manner in which forests are utilised. Alternative specifications of property rights will affect output and allocation (coordination), as different sets of rights give rise to different economic signals and incentives towards the use of resources. Behavioural differences can be illustrated through the use of a production function (Eggertsson, 1990a; 1990b):²⁵

$$Q = F_p(L, K, M, O_p; T)$$

where Q is the output and is a function of labour (L), capital services (K), and material inputs (M). " T " is the vector representing technology and the state of knowledge relevant to production and " O " a set of contracts between the owners of inputs. The organisation space is constrained by the prevailing structure of property rights, " p ", and F_p is the production function that corresponds to the property rights structure " p ".²⁶

²³ Furubotn and Pejovich, op. cit., p. 1139.

²⁴ *ibid.*

²⁵ See Eggertsson, (1990a), op. cit., pp. 125-130 and T. Eggertsson, "The Role of Transaction Costs and Property Rights in Economic Analysis", *European Economic Review* 34, (1990b), p. 451.

²⁶ Neoclassical economics assumes an unspecified ideal structure of rights. As such, " p " does not matter for the production function above and could be assumed away. However neoinstitutional economics stresses that the function above depends on the specification of property rights " p " and the outcome is affected accordingly.

Property rights specification provides the link between property rights, incentives and behaviour. Furubotn and Pejovich (1972) state that the common emphasis of the property rights school is the "interconnectedness of ownership rights, incentives, and economic behavior" which supplants and extends the scope of the traditional theory of production and exchange.²⁷ Furubotn and Pejovich also state that "a more complete specification of individual property rights diminishes uncertainty and tends to promote efficient allocation and use of resources."²⁸

In recent years, formal attempts have been made to incorporate property rights and transaction costs (costs of specifying rights and of exchange) into neoclassical economics to analyse economic behaviour (Drobak and Nye, 1997; Eggertsson, 1990a, 1990b; Eggertsson in Foss, 1995; Eggertsson in Alston, Eggertsson, and North, 1996; Randall, 1975; North, 1981, 1986; Wills, 1997; Yang and Wills, 1990). No specific name was given to this school of thought until the 1990s, when Eggertsson (1990) christened this approach 'neoinstitutional economics', a subset of New Institutional Economics (NIE).²⁹

Neoinstitutional economics widens the scope of neoclassical economics, but it does not constitute a separate paradigm, as the basic core of the neoclassical approach has remained unchanged (Alston, Eggertsson, and North, 1996; Furubotn and Pejovich, 1972; Eggertsson 1990a, 1990b). Neoinstitutional economics retains all the essential elements of the economic approach: stable preferences, the rational choice model, and equilibria (Eggertsson, 1990b).³⁰ Central to this approach, like that of neoclassical economics, is the upholding of the basic tenets of rational choice: economic agents maximise an objective function subject to constraints.³¹ However, unlike neoclassical economics, which assumes that information is costless, that an idealised set of rules governing markets and political exchange exists, and that transaction costs are zero, the emphasis of neoinstitutional

²⁷ Furubotn, and Pejovich, op. cit., p. 1137.

²⁸ *ibid.*, p. 1141.

²⁹ Eggertsson, op. cit., 1990a, p. 6. Recent developments in New Institutional Economics are contained in volume by J.N. Drobak and J.V.C. Nye (editors), *The Frontiers of the New Institutional Economics*. San Diego, California: Academic Press, 1997.

³⁰ Eggertsson, 1990a, op. cit., pp. 5-6.

³¹ *ibid.*, p. 7.

economics is on testing real world observations with a relaxation of these assumptions (Alston, Eggertsson, and North, 1996; Eggertsson, 1990a; North, 1986).³²

The specification of rights, costs of contracting, and costs of defining and enforcing property rights have profound effects on economic behaviour by affecting the allocation of resources and the structure of economic organisation.³³ As Eggertsson in Alston, Eggertsson, and North (1996) points out, the creation of value is curtailed when property rights are undefined or unclear.³⁴ High transaction costs can limit and prevent enforcement and can therefore result in a misallocation of resources (discussed in more detail in Section 2.3.2 of this thesis). Eggertsson (1990a, 1990b, in Foss 1995) credits the foundation of NIE to Coase (1937, 1960).³⁵

Numerous empirical studies point to the link between property rights specification and incentives, and hence the importance of property rights in influencing economic behaviour. Alston, Libecap, and Schneider (1995) emphasise how property rights institutions act as a precondition for the development of markets in frontier areas, as rights facilitate allocation and social exchange. Cheung (1970) discusses the importance of a contract (set of property rights) and of exclusion in governing resource use, and points out that an "absence of a contract will lead to different resource use than when an enforceable contract exists."³⁶ Cheung also points out that the right to contract includes the right to exclude.³⁷ This implies that without exclusion, the exchange of property rights is not possible.³⁸ Cheung (1973) shows how contractual arrangements (property rights) between bee-keepers and apple-farmers have facilitated the efficient allocation of beehives for the pollination of apple trees.³⁹ Cheung (1974) illustrates how changes in the specification of the right to receive income from rental property, achieved by rent controls (whereby the

³² See, for example, a detailed application of NIE on an empirical situation by Nabli and Nugent (1989) in their study of the economic development of Tunisia; an interesting application of NIE into many wide and varied fields.

³³ Eggertsson, 1990a, op. cit., p. 14

³⁴ T. Eggertsson, "A Note on the Economics of Institutions", in L.J. Alston, T. Eggertsson, and D.C. North, editors, *Empirical Studies in Institutional Change*. USA: Cambridge University Press, 1996, p. 9.

³⁵ Eggertsson, 1990b, op. cit., p. 456.

³⁶ S. Cheung, "The Structure of a Contract and the Theory of a Non-Exclusive Resource", *The Journal of Law and Economics* XIII, No. 1 (April 1970), p. 51.

³⁷ *ibid.*, p. 52.

³⁸ *ibid.*, p. 67.

rent received by the landlord is lower than the market rate), affect economic behaviour by lowering the landlord's incentive to use housing as rental property.⁴⁰

The importance of property rights specification in coordination is discussed in Demsetz (1964):

It is well known that prices can serve as guideposts to where resources are wanted most, and in addition, that exchangeability of goods at these prices can provide incentives for people to follow these guideposts. However, analytical concentration on the price mechanism has kept us from closely examining what is being traded. The value of what is being traded depends crucially on the rights of action over the physical commodity and on how these rights are enforced. The enforcement of the accompanying property rights has an important impact on the ability of prices to measure benefits.⁴¹

The ideal condition of complete coordination holds in a world in which property rights are assigned for all resources and in which the costs of policing and exchanging rights are zero (Demsetz, 1966).⁴² North (1990) explains how economic performance and incentives are affected by the existing structure of property rights which may persist as a result of information, measurement, and enforcement costs and the subjective perceptions (ideologies, preferences etc) of political actors.⁴³

One important theme emerges time and again from the property rights literature: alternative specifications of property rights give rise to different incentives. This in turn affects economic behaviour and the manner in which resources are used.

Nevertheless, a distinction needs to be made between private rights exercised by individuals and public property rights exercised by officials. In the latter case, the consequences of decisions may not be fully experienced by the politicians or bureaucrats

³⁹ S. Cheung, "The Fable of the Bees", *The Journal of Law and Economics* XVI, No. 1 (April 1973), pp. 29-32.

⁴⁰ S. Cheung, "A Theory of Price Control", *The Journal of Law and Economics* XVII, No. 1 (April 1974), p. 63.

⁴¹ H. Demsetz, "The Exchange and Enforcement of Property Rights", *The Journal of Law and Economics* VII, (October 1964), p. 17.

⁴² H. Demsetz, "Some Aspects of Property Rights" *The Journal of Law and Economics* IX, (October 1966), p. 62.

⁴³ D.C. North, *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press, 1990, p. 52.

themselves (Anderson and Leal, 1991; Wills, 1997). Thus, decisions made by officials may not fully reflect overall community desires,⁴⁴ as was discussed earlier in this chapter, as political systems are open to change through rent seeking activity. Furthermore, as the public faces costs in monitoring and penalising deviance by politicians and bureaucrats, they will have some freedom to pursue personal goals that are inconsistent with maximising overall community interests (Wills, 1997).⁴⁵

2.3.2 Cost Barriers to Precise Specification of Property Rights

Wills (1997) provides a useful framework that connects the specification of property rights to the attendant costs of specifying such rights. For property rights to be precisely specified, and for social coordination to be achieved, several conditions must be satisfied.⁴⁶ Property rights in an asset must be clearly defined, which requires identification of assets, identification of right-holders, identification of asset users and specification of the precise rights being delineated with regards to ownership, use, transfer, and exclusion. The rights must also be strictly enforced, with enforcement involving either physical exclusion measures ('fencing' or boundary demarcation) and/or monitoring and subsequent penalising of illegitimate use.⁴⁷ Strict enforcement is what makes an asset exclusive, with all benefits and costs arising from the use or transfer of a defined asset accruing to the individual right holder. Strict enforcement also creates the condition for assets to be exchanged, that is, for voluntary transfers of assets to those individuals who can use such assets in the most valuable way. Table 2.1 lists the activities involved in the specification of property rights.⁴⁸

⁴⁴ Wills, 1997, op. cit., p. 106.

⁴⁵ *ibid.*

⁴⁶ *ibid.*, pp. 69-71.

⁴⁷ *ibid.*, p. 23.

⁴⁸ Consider the definition and enforcement of rights to biodiversity. First, there are costs of identifying potential areas containing important sources of biodiversity (aerial and land survey to constitute such areas for conservation), identifying native groups who already own these tracts of forests, also of identifying potential interested users. There is also the cost of measurement (inventorying the animal and plant species in the area). Enforcement would require fencing or demarcating boundaries, erecting sign boards and monitoring through periodic surveys and of penalising non-authorised users who illegally trespass into such areas. These activities are costly and can exceed benefits, therefore hindering the signalling of biodiversity value and of incentives which are essential for the overall coordination of forests. In addition, limited scientific information also makes it difficult to measure the precise value of biodiversity.

Table 2.1: Activities Required for the Specification of Property Rights⁴⁹

Activities
Identification: Assets Right Holders and Rights Asset Users
Measurement of: Assets Asset Use
Physical Exclusion of: Non-right holders by some sort of 'fencing'
Penalising/Rewarding of: Illegitimate Users by the Authorities, Social Pressure, Courts through Monitoring

Source: Wills (1997)

The costs of specifying property rights which involve the above activities are commonly referred in the literature on property rights as "transaction costs".⁵⁰ Coase (1960), the originator of the property rights school, explained that high transaction costs may hinder allocation as this "prevent[s] many transactions that would be carried out in a world in which the price mechanism worked without cost ...".⁵¹ This means that resources may be prevented from being allocated towards their most valuable uses due to the costs of specifying rights.⁵² As such, there is "the need to introduce positive transaction costs explicitly into economic analysis so that we can study the world that exists."⁵³ Prohibitive costs of definition and enforcement limit the effectiveness of property rights in guiding

⁴⁹ Wills, 1997, op. cit., p. 71.

⁵⁰ As far as possible, more specific terms like definition, monitoring, enforcement and penalising costs will be used instead of the generic term "transaction costs". The use of more specific terminology allows for a clearer understanding of costs associated with a particular specification activity.

⁵¹ R.H. Coase, "The Problem of Social Cost", *The Journal of Law and Economics* III, (October 1960), p. 15.

⁵² In an ideal world without transaction costs, it does not matter for allocation which party has the initial property rights to the use of a resource (however the designation of rights does affect distribution); negotiation among parties will transfer rights to the highest valued user and this would ensure that resources are allocated efficiently (the value of production would be maximised). See Coase, 1960, op. cit., p.6 and pp. 8-15.

⁵³ R.H. Coase, *The Firm the Market and the Law*. Chicago and London: The University of Chicago Press, 1988, op. cit., p. 15.

allocation (Coase, 1960), and, in the context of this thesis, creates the potential for conflicts to arise when signalling and incentives are incomplete or unclear.

The connection between the physical attributes of resources and the costliness of specifying rights is also discussed in Cheung (1970). The absence of exclusivity (which is one necessary condition for coordination) may be due to the prohibitively high costs of defining and policing the right associated with the "physical attributes of the resource in question."⁵⁴ Costs identified by Cheung include assessing, quantifying, identifying and policing rights to such resources. Prohibitive costs prevent exclusion, one of the necessary prerequisites in social coordination and market exchange. Eggertson (1990a) emphasises the relevance of costs in exclusion in the following manner:

The enforcement of property rights involves excluding others from the use of scarce resources. Exclusive ownership calls for costly measurement and delineation of assets and enforcement of ownership rights. The value of exclusive ownership rights depends, *ceteris paribus*, on the cost of enforcing those rights -- that is, excluding others ...⁵⁵

The discussion on the costliness of specifying rights must not overshadow one important fact. Public or private property rights may not be defined or enforced because the costs of specification exceed the perceived benefits from previously specified rights (De Alessi, 1983a; Demsetz, 1964, 1966, 1967; Tisdell, 1993; Wills, 1995-96; Yang and Wills, 1990). Thus, it is necessary to examine the costs of specification to ascertain if costs are in excess of benefits.

Unspecified rights allow individuals or groups not to bear the full consequences when they use a particular resource. In such cases, users do not have the correct incentives to consider the impact of their actions on others. High costs of specifying property rights lead to what economists term externalities. Externalities are "consequences (benefits and costs) of actions (consumption, production or exchange) that are not borne by the decision maker, and hence do not influence his or her action."⁵⁶ In the context of this thesis, precisely

⁵⁴ Cheung, 1970, *op. cit.*, p. 67.

⁵⁵ Eggertson, 1990a, *op. cit.*, p. 35.

⁵⁶ Wills, 1997, *op. cit.*, p. 63.

specified and transferable public or private property rights in resources would remove externalities as this provides information on, and incentives for, individuals to consider interrelated impacts, as each would suffer all the consequential costs or benefits of their actions. Thus, as stated by Wills (1995-96):⁵⁷

If individual decision makers, private or public, experience benefits and costs commensurate with all the benefits and harms which their commercial and political actions impose on others, they have appropriate incentives to modify their behaviour in the interests of others. Ideally this is what a system of property rights and signalling and incentives would achieve ...⁵⁸

Sets of public and private property rights which are precisely specified are sometimes referred to as a non-attenuated structure of property rights.⁵⁹ Basically, a non-attenuated structure implies clear ownership of assets with exclusive rights that are defined, enforced and transferable (Randall, 1975). For a non-attenuated structure of property rights to exist, there must be very low or zero transaction costs, so that definition and enforcement activities always cost less than the benefits of precise rights. Social coordination can therefore never be complete because of positive costs of defining and enforcing property rights:

The fundamental reason that coordination of natural resource use can never be perfect is that it costs too much. Defining and enforcing property rights, signalling, rewarding and penalising private and public decision makers all require resources which have other valued uses, so it does not pay to strive for perfect coordination between resource users and those they harm.⁶⁰

Intrinsic Forest Characteristics and Transaction Costs

Why do failures of coordination occur when markets and central planners allocate environmental resources? In particular, what makes it difficult to identify the values of some forest functions and to incorporate these values in market or political deals? The

⁵⁷ Wills, 1995-96, op. cit., p. 60.

⁵⁸ *ibid.*, p. 59.

⁵⁹ Further discussions of a non-attenuated structure of property rights can be found in Furubotn and Pejovich, op. cit., p. 1140; H. Demsetz, "Some Aspects of Property Rights" *The Journal of Law and Economics* IX, (October 1966), p. 62; and S. Cheung, "The Structure of a Contract and the Theory of a Non-Exclusive Resource", *The Journal of Law and Economics* XIII, No. 1 (April 1970), pp. 67-68.

intrinsic characteristics of some forest functions do not allow for the complete signalling of their values which in turn undermines resource users' incentives to respond to the concerns of others. These intrinsic characteristics are non-rivalry and non-excludability.

The importance of non-rivalry and non-excludability for property rights and social coordination has been discussed in Wills (1997). Non-rivalry is a physical characteristic where additional individuals can enjoy the benefits (or suffer the costs) from the same unit of a forest function with little or no diminishing impact. Non-rivalry is the result of the natural dispersion of the benefits (or costs) of the forest function across space and people.⁶¹ For example, one person or group's satisfaction (benefit) from knowledge of the existence of forest biodiversity does not reduce the satisfaction (benefit) that other persons or groups derive from the same knowledge.

Non-excludability occurs when it is either very costly (relative to benefits) or technically impossible⁶² to exclude non-contributors from enjoying the benefits of using a resource. In other words, it is too costly, relative to the value of a resource, to either physically exclude or to identify and penalise illegitimate resource users. Such high costs of exclusion lead to incomplete social coordination. For example, the harvesting of forests based on standards set in the forest engineering plans in Sarawak ensures that water pollution and soil erosion are minimised. This benefit then flows to natives and agriculturalists who use rivers downstream. However, due to the physical extent of forests and rivers in Sarawak, it is too costly for the Forest Department to exclude or to identify and charge loggers who fail to observe the engineering plans. As a result, property rights to clean water may remain unspecified due to high monitoring and exclusion costs.

Non-excludability is economically determined, thus the costs of exclusion can be reduced by scientific and technological advances.⁶³ The costs of exclusion may be lowered to such an extent that it may become feasible for rights to be defined and enforced, and hence for exclusion to be effected. Alternatively, if the benefits from resources (in terms of higher

⁶⁰ Wills, 1995-96, *op. cit.*, p. 59.

⁶¹ Wills, 1997, *op. cit.*, p. 81.

⁶² Technical methods include signs, locks, fences, and surveillance cameras; *ibid.*, p. 81.

⁶³ Wills, 1997, *op. cit.*, pp. 81-82.

values which may be caused by rising scarcity of environmental resources) increase relative to costs, it may be feasible for property rights to be defined and enforced (Demsetz, 1967).

Non-excludability and non-rivalry together lead to free riding (obtaining benefits without paying a corresponding share of the costs involved in providing this good).⁶⁴ Goods which are non-excludable and non-rival can be enjoyed by a large number of individuals who can benefit from free riding because exclusion is too costly. Goods that have both characteristics are commonly referred to as "public goods" in economic literature.⁶⁵ Free riding leads to incomplete social coordination, as values are not signalled by individuals who free ride -- those who benefit need not indicate their willingness to pay, as benefits can be obtained without payment.⁶⁶

2.4 Public Choice Theory and the Specification of Rights

Imprecise specification of property rights and an absence of social coordination are not always the result of low resource values and/or the high costs of specifying rights. The state plays a role in the definition and enforcement of rights, which is influenced not only by resource values and costs but also by political objectives, interests, and incentives. High costs of property rights specification may impede social coordination, but politicians and bureaucrats motivated by political considerations may also influence the stance taken on definition and enforcement activities (Libecap, 1989; North, 1990). This is manifested when property rights are not specified, even when the benefits of rights specification exceed its costs. This is where public choice theory becomes relevant.

⁶⁴ I. Wills, "Environmental Problems", *Policy* 11, No. 4 (Summer 1995-96), p. 62.

⁶⁵ Not all forest functions have both characteristics and as such are not pure public goods. For example, the recreation and tourism function provided by forests are non-rival at low intensities but can be excluded by fencing. Hence, it would be preferable to identify each forest function in the following terms: excludable/non-excludable and rival/non-rival as per Wills (1997).

⁶⁶ Environmental resources in general often have characteristics of non-excludability and non-rivalry although the extent of non-excludability and non-rivalry may vary depending on the characteristic of the resource. See Wills, 1997, op. cit., p. 99.

Public choice theory is a relatively new school of thought founded by Duncan Black in 1948.⁶⁷ Public choice practitioners "seek to understand and predict the behaviour of political markets by utilizing the analytical techniques of economics, most notably the rational choice postulate, in the modelling of non-market decision-making behaviour."⁶⁸ Public choice theory is the application of neo-classical economic tools (rationality, self interest, utility maximisation, etc) to explain behaviour in politics (Mueller, 1989, 1997, Orchard and Stretton, 1997).⁶⁹ In public choice, all political decision makers are assumed to seek their own self interests (Mueller, 1997), as in the market place. Public choice emphasises the need to look at incentives and information faced by public decision makers in making choices in any sphere.

This section begins with a discussion of the treatment of the roles of public decision makers (politicians and bureaucrats) and of interest groups in neoinstitutional economics and the property rights literature, prior to discussing the public choice approach to specifying rights.

- *Neoinstitutional Economics and the Role of Politics*

The property rights literature, while attributing imprecise rights specification to transaction costs, does not always pay attention to the roles of politicians and bureaucrats, and of the various interest groups in influencing the specification of property rights. There are exceptions: De Alessi (1983a) points out that "the establishment and enforcement of a specific system of property rights depends not only upon considerations of economic efficiency, but also upon individual preferences and political realities within a community."⁷⁰ North (1986) points to the importance of the state in relation to the specification of institutions (of which property rights are a subset)⁷¹ and emphasises that

⁶⁷ C.K. Rowley, "A Public Choice and Social Choice Perspective", in P. Foss, ed., *Economic Approaches to Organizations and Institutions*. Aldershot: Dartmouth Publishing Company Ltd., 1995, p. 63.

⁶⁸ *ibid.*

⁶⁹ See D.C. Mueller, "Public Choice in Perspective", in D.C. Mueller, *Perspectives on Public Choice: A Handbook*. United Kingdom: Cambridge University Press, 1997, chapter 1, for a survey of past and recent developments in public choice theory.

⁷⁰ De Alessi, 1983a, *op. cit.*, p. 62.

⁷¹ D.C. North, "The New Institutional Economics", *Journal of Institutional and Theoretical Economics* 142, (1986), p. 231.

the specification of property rights ultimately involves a theory of the state and organisations (interest groups).⁷² According to North, principals (community members) are separated from their agents (politicians, bureaucrats), and as it is costly to measure and reward or penalise agents' performance, there is "substantial latitude" with respect to political decision making which may not lead to a favourable outcome.⁷³ Eggertsson (in Foss 1995) adopts the view that the structure of property rights changes according to the decisions of powerful actors and organisations, with efficiency not assumed under all circumstances as such actors and organisations may not have the intent of maximising the joint wealth of the community.⁷⁴ However, neoinstitutional economists have yet to provide a fully systematic approach towards the study of politicians, bureaucrats, and interest groups, and the incentives they face in making decisions on the definition and enforcement of property rights. Eggertsson (1990a) admits this and points out that neoinstitutional economics still does not have a workable theory of ideology⁷⁵ and is still in the preliminary stages of formulating an understanding of the nature of the state and of the contribution of the governmental structure of a country to the determination of the property rights structure in a country.⁷⁶ The work by Libecap (1989) could be said to be one of the earliest attempts at integration of neoinstitutional economics and politics in determining the specification of property rights.

Libecap (1989) presents a specific discussion of political-economic interactions in the specification of rights, and explicitly considers the interaction of politicians, bureaucrats, and interest groups in deciding the stance taken in property rights specification. Libecap

⁷² As North states: "We should conceive of organizations as either maximizing within the framework of the existing institutions; or devoting resources to altering the institutional framework by altering property rights directly or indirectly, through the political structure. Whether an organization devotes its resources to the former activity or to the latter depends on the relative costs and benefits of such activity... the whole development of the new institutional economics must not only be a theory of property rights and their evolution but a theory of the political process, a theory of the state, and of the way in which the institutional structure of the state and its individuals specify and enforce property rights."; *ibid.*, pp. 232-233.

⁷³ *ibid.*, p. 233-235.

⁷⁴ Eggertsson in Foss (1993) states: "Only in specific circumstances can we agree with Becker's ... statement of the weak efficiency hypothesis that 'institutions evolve for various reasons, but whatever their intent including 'exploitation' of weak groups, they accomplish their goals efficiently; that is to minimize transaction costs'; T. Eggertsson, 'Economic Perspectives on Property Rights and the Economics of Institutions' in P. Foss, ed., *Economic Approaches to Organizations and Institutions*. Aldershot: Dartmouth Publishing Company Ltd., 1995, p. 57 and see also D.C. North, 'A Framework for Analyzing the State in Economic History', *Explorations in Economic History* 16, No. 3 (July 1979), p. 256.

⁷⁵ Eggertsson, 1990a, *op. cit.*, p. 76.

⁷⁶ *ibid.*, p. 79.

combines concepts in public choice theory (consisting of political bargaining) with property rights concepts to explain the development and evolution of property rights in common pool resources. In Libecap's words:

The analytical framework is a very microoriented one. It focuses on the political bargaining or contracting underlying the establishment or change of property rights institutions, and it examines the motives and political power of the various parties involved. This approach is taken because ownership structures are politically determined, and they assign both wealth and political power in a society. Property rights are viewed here as being more than remnants of past legal and social traditions, although they are affected by them, and as being molded by political maneuvering and bargaining among many competing interest groups.⁷⁷

Riker and Sened in Alston, Eggertsson, and North (1996) also exposit a political-economic approach to examine the processes involved defining and enforcing property rights. Their approach is similar to Libecap (1989) in that a change in value of a resource induces right holders to desire a clearer specification of rights. Rule makers will only specify the rights when it is to their advantage to do so.⁷⁸ However, unlike Libecap, Riker and Sened do not explicitly consider the costs of collective action which play a crucial role in influencing the demand for property rights specification.

- *Public Choice Theory and the Definition and Enforcement of Property Rights*

The stance taken by politicians, bureaucrats, and various interest groups in the specification of rights has been clearly addressed by the public choice literature. All strands of public choice examine the motivations and incentives faced by public decision makers in political contracting, or in maintaining or changing the *status quo* in property rights, as in the case of this study.

⁷⁷ G.D. Libecap, *Contracting for Property Rights*. Cambridge: Cambridge University Press, 1989, p. 10.

⁷⁸ W.H. Riker, and I. Sened, "A Political Theory of the Origin of Property Rights: Airport Slots" in L.J. Alston, T. Eggertsson, and D.C. North, editors, *Empirical Studies in Institutional Change*. USA: Cambridge University Press, 1996, p. 287.

There are three prevailing schools of thought.⁷⁹ The first is the Rochester school of positive political theory which for most part is theoretical and abstract (game theoretical approaches), and has an apolitical neutral approach towards bureaucracies and interest group politics.⁸⁰ The second school, the Chicago political economy programme (CPE), is empirical in its focus.⁸¹ CPE, originating with Stigler,⁸² uses price theory and positive economics to analyse government behaviour (Tollison, 1989). Pasour (1992) points out that CPE tends to view all outcomes as optimal (efficient in a comparative institutions sense as the best alternative has been chosen with deadweight costs minimised) subject to the constraints faced by politicians and interest groups alike.⁸³ CPE also assumes that political agents are mainly driven by constraints and not preferences (Mitchell, 1988; Pasour, 1992; Jakee and Allen, forthcoming; Rowley in Foss (1993); Tollison, 1989). Political markets are also assumed to be efficient in consolidating all relevant information⁸⁴ (voters are well informed, bureaucrats are efficiently controlled by the legislature, and the common law system⁸⁵ is economically efficient) within the constraints faced, with the thrust of the theory towards "instantaneous and durable equilibrium, with political markets always clearing."⁸⁶ Altruism, ideology, and patronage play no part in the utility function of the political agent; indeed CPE regards this to be in the domain of sociology.⁸⁷

The assumptions of CPE limit the applicability of this strand of public choice for examining the specification of forest property rights in Sarawak. As discussed in Chapter One, the specification of property rights appears to be inefficient for some forest functions (notably commercial timber production and native subsistence needs) because the state has

⁷⁹ Rowley, op. cit., pp. 65-81.

⁸⁰ However, this has in turn made the relevance of this school limited to mainly theoretical discussions of public choice with no institutional and empirical elements involved; although, in recent years, some researchers in the Rochester school have branched into a more empirical focus of political science (Mitchell, 1988).

⁸¹ R.D. Tollison, "Chicago Political Economy", *Public Choice* 63, No. 3 (1989), p. 293.

⁸² Other proponents of CPE include Becker, and Peltzman (Pasour, 1992).

⁸³ E.C. Pasour, Jr., "Economists and Public Policy: Chicago Political Economy Versus Conventional Views", *Public Choice* 74, No. 2 (September 1992), pp. 156-157.

⁸⁴ Subject to cost constraints of acquiring of such information and where the benefits of acquiring such information exceed its costs.

⁸⁵ On the efficiency of law from a public choice perspective, see Crew and Twight (1990) who discuss how inefficiency in the legal system can occur because government officials have the incentive and ability to manipulate information.

⁸⁶ Rowley, op. cit., p. 67.

failed to change the *status quo* specification of rights, even when the marginal benefits of specification may exceed its costs. There is no instantaneous adjustment towards the equilibrium or efficiency which CPE presumes to be the norm. This is where Virginia Political Economy (VPE) is relevant and useful.

The VPE public choice approach is particularly useful for explaining the political stance taken in the specification of property rights.⁸⁸ This strand of public choice explains public decision makers' behaviour by incorporating the role of information, preferences, ideas, and political patronage as factors influencing the stance taken by politicians and bureaucrats in the definition and enforcement of property rights. In VPE, ideas can be influenced by the climate of intellectual opinion which in turn is influenced by new information. As Pasour (1992) points out: "[i]deas can have consequences even in the short run because the reward-cost structures that confront individual citizens may change quickly in response to new information."⁸⁹ New information which affects intellectual thinking gradually spreads to the public at large, ultimately resulting in public pressure on politicians which affects the course of public policy.⁹⁰ An example could be the increasing environmental consciousness of societies since the 1980s. The focus of VPE however is on the response of the politicians (with their own objective function) to collective action by the various interest groups. Political decision makers' objectives include maximising financial support, maximising votes, ideological goals, and altruism (Mueller, 1997).

In this thesis, the focus is on changes in the definition and enforcement of property rights to forest functions as a manifestation of interactions in political markets. Regulators (politicians and bureaucrats) allocate benefits or costs to different interest groups (via definition and enforcement of rights) in a manner that enhances their own political support (or other relevant objectives). The role of special interest groups and costs of collective

⁸⁷ *ibid.*, p. 66.

⁸⁸ An exhaustive volume of works in VPE is Buchanan and Tollison, eds., (1984). Aspects covered include both theoretical developments and empirical applications of public choice to the study of rent seeking, political resource allocation, theories of the state, and constitutional and philosophical issues. See also Mueller (1997).

⁸⁹ Pasour, *op. cit.*, p. 162.

⁹⁰ *ibid.*.

action by these groups in influencing political actions forms an important focus of VPE (Jakee and Allen, forthcoming).⁹¹

Like other strands of public choice, VPE analyses government from the perspective of neo-classical economics, whereby self seeking individuals attempt to maximise their net benefits from a particular action.⁹² Politicians perform the role of supplying property rights with the objective of maximising their own objective function (expected increase in support, expected votes, aspirations, and ideology). Special interest groups and voters capable of "effective organisation" make demands for a particular stance of property rights' specification.⁹³ In line with the framework that will be presented later in this chapter, VPE public choice analysts study the factors affecting the demand (by interest groups) and supply (by politicians and bureaucrats) of property rights' specification that results in a particular stance in the specification of property rights.

VPE does not assume that political markets are efficient,⁹⁴ and hence it allows for interest groups and the state to exercise significant discretionary power in political markets due to imperfections present in such markets.⁹⁵ These imperfections arise mainly from rational ignorance (information can be costly),⁹⁶ perverse incentives, and also externalities present in political markets.⁹⁷

Such imperfections allow interest groups to have significant influence on public decisions.⁹⁸ The possibility of groups of individuals (politicians, bureaucrats, private interest groups) creating distortions in policies contrary to the interests of the community

⁹¹ In this instance of the stance taken in the specification of property rights to the various forest functions.

⁹² Rowley, op. cit., pp. 66-69.

⁹³ M.A. Crew, and C.K. Rowley, "Toward a Public Choice Theory of Monopoly Regulation", *Public Choice* 57, (1988), p. 61.

⁹⁴ Mitchell, op. cit., p. 107.

⁹⁵ Rowley, op. cit., p. 69.

⁹⁶ Affected groups will rarely have complete information of the total impact of different stances taken in the specification of property rights on their well being as the costs incurred in acquiring such information exceeds the benefits. Hence such groups will remain rationally ignorant of such impacts.

⁹⁷ Mitchell, op. cit., p. 107.

⁹⁸ The following may occur: state may pass legislation that favours interests of the ruling party at the expense of social welfare, and disguise this in the form of pursuing development goals for the general public interest; special small interest groups may exert undue influence the political state machinery through active or passive lobbying; bureaucrats have concerns independent of both politicians and the general public and sometimes exercise their authority to favour their own interests.

as a whole is allowed for in this approach. Uncertainty, costly information, and perverse incentives⁹⁹ exist in political markets which then results in imperfect coordination (Pasour, 1992).¹⁰⁰

To uncover the dynamics that lead to change, Alston in Alston, Eggertsson, and North (1996) suggests looking at institutional change (changes in property rights definition and enforcement) as "the result of supply and demand forces in a society."¹⁰¹ In this thesis, demanders of property rights are represented by native groups, Sahabat Alam Malaysia (SAM), Worldwide Fund for Nature Malaysia (WWFM), Sarawak Timber Association (STA), and the International Tropical Timber Organisation (ITTO), while suppliers of property rights are Sarawakian politicians and bureaucrats. In the context of Sarawak, it should also be noted that this demarcation is not so clearcut, as Alston suggests, because state officials can also be present in the demanders' camp (notably STA). However the usefulness of this approach lies in its power of explaining the path property rights specification is likely to follow through the bargaining actions of demanders and suppliers of property rights in a political marketplace.

2.4.1 Lobbying and Collective Action by Interest Groups: Demand for Property Rights Specification

Collective action by interest groups can play an important role in signalling information and providing incentives to public decision makers. This is an important concept developed in VPE. Nevertheless, specific explanations seeking to clarify the link behind collective action and a respecification of property rights have been more appropriately found outside VPE in Alston in Alston, Eggertsson, and North (1996), and Libecap (1989) which are not VPE specific but do not run contrary to its principles.

This section discusses factors affecting the interest groups' demand for the specification of property rights. The main motivation that stimulates collective action (creation of a new

⁹⁹ Incentives that stifle efficiency.

¹⁰⁰ Pasour, op. cit., p. 154.

¹⁰¹ L.J. Alston, "Empirical Work in Institutional Economics: An Overview" in Alston, L.J., Eggertsson, T., and North, D.C., editors, *Empirical Studies in Institutional Change*. USA: Cambridge University Press, 1996, p. 27.

group or galvanising of action by an existing group) by interest groups is a shift in the value of a resource which increases the benefits that could accrue to a particular interest group from a respecification of property rights (Libecap, 1989). This thesis also expands on the discussion in Alston in Alston, Eggertsson, and North (1996) regarding the effects of demand and supply on institutional change.

Libecap explains how recontracting for a change in the *status quo* specification of property rights arises when there are shifts in the existing price (value) of a resource, changes in production and enforcement technology, or shifts in political preferences (and other political parameters).¹⁰² ¹⁰³ The effect of technological changes on costs will not be considered in this thesis because of a lack of any major technological change in the 1980s and 1990s which has effectively lowered the costs of specifying forest property rights in Sarawak.¹⁰⁴

Adapting Libecap's (1989) model to this thesis: if rights have not been well specified previously, as is the case for some forest functions in Sarawak; and when the value of a particular function increases, new incentives will now exist for affected groups to lobby for a (re)specification of property rights which will allow them to capture the increased value of the function. Inherent in this explanation of the emergence of a new set of specified property rights is the interaction between interest groups or demanders (who make the collective decision to lobby) and bureaucrats and politicians or suppliers (public decision makers) in changing *status quo* property rights. Libecap emphasises the importance of identifying the interest groups¹⁰⁵ that are involved in contracting for a respecification of property rights, and examining factors that influence their political power in bargaining.¹⁰⁶ All things being equal, groups with "greater wealth, size, and homogeneity will have more resources to influence politicians regarding the assignment of

¹⁰² Libecap, op. cit., p. 16.

¹⁰³ In Libecap (1989), political parameters include "legal precedents, distributional norms, and individual expectations regarding the use of the political process to assign property rights, influence contracting costs and the range of institutional alternatives available..."; *ibid.*, p. 18.

¹⁰⁴ Although satellite monitoring technologies have been introduced during this period, there are limitations of this technology that does not allow for this innovation to replace existing methods of monitoring.

¹⁰⁵ Libecap's (1989) discussions on collective action are consistent with VPE although Libecap does not label his public choice approach as such.

¹⁰⁶ Libecap, op. cit., pp. 10-11, and p. 21.

property rights, more votes to attract attention to their demands, more cohesion to be effective lobbyists."¹⁰⁷ Groups also form coalitions to increase their political influence,¹⁰⁸ and this is evident in the case of the network of links formed by interest groups in Sarawak (discussed in Chapter Six). Naturally, there are trade-offs between larger group size and group organisation costs.

In VPE, values that politicians and bureaucrats receive may be distorted by the bias introduced by interest groups.¹⁰⁹ Wills (1997)¹¹⁰ points out that some groups may find it worthwhile to signal values while some may not bother thus "distorting the value received by planners."¹¹¹ Those groups that can pressure the state most effectively will stand to benefit. And groups that have lower costs of collective action will tend to have most influence on the specification of property rights by the politicians. This process of pressure group activities introducing bias into the political market arises from rational ignorance (costly information) on the part of politicians (Browning and Browning, 1983). Special interest groups readily bring attention to particular issues and, in a world of costly information and rational ignorance, politicians may accord extra attention to such issues and partially or fully comply with such demands.¹¹² VPE derives much of its analytical power by specifying the role and influence of such interest groups and the significance of lobbying in inducing institutional change.

Drawing from theories of collective action (Hardin, 1982; Olson, 1965), VPE adopts the view that groups that are effective lobbyists or those that can dominate regulatory decisions are groups that have similar interests, which are cohesive, and have skilful leaders (Jakee and Allen, forthcoming). Also, longer established groups tend to have better

¹⁰⁷ *ibid.*, p. 17.

¹⁰⁸ *ibid.*, p. 27.

¹⁰⁹ Rowley, *op. cit.*, p. 72. See also Wills, (1997), *op. cit.*, Chapter 8.

¹¹⁰ Wills (1997) does not attach his discussion of public choice to any specific strand. However, most of the views therein are consistent with that of VPE.

¹¹¹ Wills, *op. cit.*, pp. 43-45.

¹¹² As Browning and Browning (1983) state: "Politicians do not have full knowledge of the interests of their constituents: A lobby can inform a politician that there are x thousands of voters with a deep interest in a particular issue. ... In a world of rational ignorance, lobbies can probably mobilize more voters and bring these votes to the attention of the relevant politicians more readily than if the group were unorganized. So lobbies may exercise some independent influence on legislation decisions."; in E.K. Browning, and J.M. Browning, *Public Finance and the Price System (Second Edition)*. New York: Macmillan Publishing Co., Inc., 1983, p. 77.

organisational skills which also increases effectiveness. Jakee and Allen also point out that the more time an interest group has had to become familiar with governmental procedures, the greater the likelihood that they will be able to successfully divert resources through political lobbying. Past lobbying experience therefore lowers the current costs of lobbying. This also finds support in Libecap (1989). Groups that are longer established may have a number of advantages over newer groups. Their demands have greater political clout because they could be comparatively wealthier, likely to have established ties to politicians, better understanding of the political process and institutions, and lower marginal lobbying expenses if past organising costs are sunk.¹¹³

Lobbying by special interest groups generates benefits that flow mainly to that group (Jakee and Allen, forthcoming; Rowley in Foss (1995), Wills, 1997). In the case of Sarawak, pressure by an influential group may lead to a more precise specification of rights to control certain forest functions, as a means of satisfying the concerns of that interest group. Although free rider problems may exist as the concerns of some interest groups do overlap, most benefits of a particular specification of rights may flow directly to a particular group, serving as a strong incentive to overcome free riding.¹¹⁴ And different interest groups in Sarawak have quite distinct concerns as discussed in Chapter One.¹¹⁵

The 'concentrated benefits diffused costs' principle in VPE is an important aspect which overcomes free riding and inertia. Interest groups have the incentive to influence the specification of rights because of this principle (Jakee and Allen, forthcoming; Pasour, 1992; and Rowley in Foss, 1995), one that, in Rowley's words, "generates substantial personal benefits for a small number of constituents while imposing a small individual

¹¹³ Libecap, op. cit., p. 6.

¹¹⁴ For example, the specification of rights to plant and animal biodiversity has been increasing in recent years through the establishment of National Parks, Wild Life Sanctuaries, and Reserves mainly due to efforts of the World Wide Fund for Nature (WWF) in Sarawak.

¹¹⁵ For example, Sahabat Alam Malaysia (SAM) is concerned with environmental and native functions which coincide with native interests in forests. The Worldwide Fund for Nature (WWF) has specific concerns about the conservation of wild life and plant biodiversity emphasising the importance of constituting Totally Protected Areas. The International Tropical Timber Organization (ITTO) has specific concerns about sustainable harvesting practices. The concerns of these groups overlap somewhat, but the majority of benefits from lobbying flow directly to the group which carries out the action. The concentration of benefits (monetary, prestige, respect, recognition of efforts) to these groups serve as motivation for such groups to act and to signal their concerns to regulators in Sarawak.

cost on a large number of other voters."¹¹⁶ In other words, benefits from respecifying rights would be concentrated on a specific group, and this in itself motivates collective action and overcomes free riding.¹¹⁷ Thus, collective action is not only motivated by benefits accruing to particular groups, but also by substantial benefits that can be derived by particular individuals within a group.¹¹⁸ As discussed in Olson (1965):

... in a very small group, where each member gets a substantial proportion of the total gain simply because there are few others in the group, a collective good can often be provided by the voluntary, self interested action of the members of the group. In smaller groups marked by considerable degrees of inequality -- that is, in groups of members of unequal "size" or extent of interest in the collective good -- there is the greatest likelihood that a collective good will be provided; for the greater the interest in the collective good of any single member, the greater the likelihood that that member will get such a significant proportion of the total benefit from the collective good that he will gain from seeing that the good is provided, even if he has to pay of the cost himself.¹¹⁹

Incentives that motivate action may not be entirely monetary in nature. Olson suggests that "prestige, respect, friendship, and other social and psychological objectives" are also important.¹²⁰ Although benefits from collective action may have "public good" characteristics which can result in free riding (those who do not lobby will also benefit), the receipt of substantial benefits by individuals within a group may be enough to motivate action by these individuals to organise collective activities on behalf of the whole group.¹²¹

¹¹⁶ Rowley, op. cit., p. 71. See also Pasour, op. cit., p. 155.

¹¹⁷ In Sarawak, for example, externalities caused by logging are spread widely across many native communities, while benefits (timber revenues) are concentrated in the hands of a few like the concessionaires, logging companies, and the state government. In this instance, the state therefore has greater incentives to define and enforce rights to favour commercial timber logging as benefits would flow directly to its coffers (the state of Sarawak gets to keep all royalties and taxes collected from timber), while external costs, which are very diffuse and smaller, would be passed to the rest of the community because of the "rational ignorance" of these groups (notably native communities and rest of the populace).

¹¹⁸ Interest group lobbying activity has alternatively been termed rent seeking. See R.D. Tollison, "Rent Seeking" in Mueller, Dennis C., *Perspectives on Public Choice: A Handbook*. United Kingdom: Cambridge University Press, 1997, p. 506.

¹¹⁹ M. Olson Jr, *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, Massachusetts: Harvard University Press, 1965, p. 34.

¹²⁰ *ibid.*, p. 60.

¹²¹ *ibid.*, p. 34.

Hardin (1982), and Lin and Nugent (1995) use the term "political entrepreneurs"¹²² to describe individuals who, for career or other reasons, find it in their private interests to provide collective benefits to other individuals in a defined group. Libecap also points out that as groups grow larger, individuals (termed entrepreneurial politicians) play a role in identifying group interests and in generating political action. Such individuals bear the organisation costs because they expect to capture returns through votes and support.¹²³ However, political entrepreneurship is not believed to play a significant part in the specification of property rights in Sarawak.

2.4.2 The Role of Politicians and Bureaucrats in the Specification of Rights: Suppliers of Property Rights

- The Role of Politicians in the Specification of Rights

Libecap (1989) and Wills (1997)¹²⁴ specifically examine incentives faced by politicians in specifying rights in natural resources. Libecap discusses the motivations behind the specification of rights whereas Wills provides a framework suitable for the analysis of environmental resources and public choice issues in Sarawak. As mentioned earlier, Libecap (1989)¹²⁵ and Wills (1997)¹²⁶ use a non-specific strand of public choice to discuss political behaviour, but one which is consistent with VPE.¹²⁷

¹²² J.Y. Lin, and J.B. Nugent, "Chapter 38: Institutions and Economic Development" in J. Behrman, and T.N., Srinivasan, eds., *Handbook of Development Economics. Vol. III*. Amsterdam: Elsevier Science B.V., 1995, p. 2239.

¹²³ Libecap, op. cit., p. 17.

¹²⁴ Wills, 1997, op. cit., Chapter 20.

¹²⁵ The strand of public choice used in Libecap (1989) is not specific to VPE. However, it should be noted that Libecap allows political preferences to influence the specification of property rights and in this sense VPE could be used in the approach to understand political contracting.

¹²⁶ Wills (1997) also incorporates many elements of VPE like ideas, collective action by the various interest groups, and the political costs and benefits that a state planner faces in adopting a certain stance of public policy.

¹²⁷ In Libecap (1989), the discussion centres on four examples of property rights specification in American economic history: minerals, federal land policies (and forests), fisheries, and oil. Wills (1997) gives examples of property rights specification in relation to mining in Coronation Hill in the Northern Territory, Australia, and in relation to biodiversity in Sarawak's forests, to illustrate the political costs and benefits faced by the politicians and bureaucrats in specifying rights.

Libecap (1989) points out that the behaviour of groups (politicians, bureaucrats, and private groups) are moulded by their attempts to maximise private net gains.¹²⁸ It is necessary to examine the preferences of political and interest groups and to consider the distribution of net gains arising from respecification in order to understand why property rights have been specified the way they are. Politicians are basically concerned with maximising votes and other forms of political support.¹²⁹ As such, they serve as brokers in responding to the demands of the various interest groups to maximise support and votes.¹³⁰ This also suggests that no group will be entirely ignored to the extent that action from these groups could translate into net gains in terms of political support or votes. Politicians will therefore specify or supply rights depending in the political costs and benefits of each action.¹³¹

In the analytical framework developed in Wills (1997) to analyse tropical deforestation, political decisions about forest preservation depend on the intrinsic characteristics of forests; in particular, the spread of benefits, and its excludability, and political decision makers' sources of value information (markets or political pressure). These factors affect political costs and benefit which in turn motivate politicians to specify rights in a manner which promotes their interest of continuing in power.¹³²

Wills (1997) first lists the various forest functions and the corresponding benefits of each function to different groups in Sarawak. Two intrinsic attributes of benefits from each forest function are likely to influence the actions of politicians responsible for supplying a particular specification of property rights. These are the spatial incidence of benefits, and the excludability of benefits.¹³³ The way forest property rights are specified affects revenue received by the state, and voter support from a particular group in the community, and thus

¹²⁸ Libecap, *op. cit.*, pp. 4-5.

¹²⁹ *ibid.*, p. 16.

¹³⁰ *ibid.*

¹³¹ *ibid.*, p. 27.

¹³² Wills, 1997, *op. cit.*, p. 295.

¹³³ See Table 20.1 of Wills, 1997, *op. cit.*, pp. 296-297 for the original table. Also, not all benefits and costs in this instance can be represented by monetary values and some even take the form of political goals: important variables like winning the next state election, protecting the way of life of forest tribes, and asserting Malaysia's rights to control its own resources may also be important, as stated by Wills. See *ibid.*, p. 294. Nevertheless, Wills does point out that benefits depends heavily on its impact on political contributions and voter support. See *ibid.*, p. 295.

career prospects of the political decision makers (politicians and bureaucrats).¹³⁴ In ascertaining changes to the current specification of property rights, Wills also points out that the political choice of one option against another is influenced by the present value of benefits and costs of different options as perceived by the decision maker.¹³⁵

Politicians will be concerned with the impact of benefits from a particular specification of rights to a forest function on their objectives of maintaining political support and power. Benefits that accrue to politicians in terms of contributions to state revenues, wealth, and winning the next state election will matter most, since they are related to the politicians' objective of staying in power.¹³⁶ The spatial incidence (or spread) of benefits from a forest function also is particularly important, as this determines whether the benefits will accrue to local, national, or international residents, and its effect on political support for the politician and his or her party. For example, if benefits are local, and the beneficiaries are local rural residents such as the various native groups, this will affect politicians' calculus of costs and benefits to the extent that native groups are able to pressure politicians through votes to specify certain rights. If native groups are politically influential, this will encourage politicians to specify rights in a way which favours natives' interests.

Forest benefits which have impacts on individuals overseas matter to the extent that overseas residents can influence Sarawak's politicians. International conservationists, for example, may disseminate information on preservation activities that portray the Sarawak Government in a favourable light, which in turn paves the way for Sarawak timber to gain easier acceptance by consumers in developed countries. Alternatively, environmentalists may disseminate negative information on the Sarawak Government's treatment of its native peoples, thus hindering the acceptability of Sarawak timber abroad, which in turn affects timber revenues.

¹³⁴ For example, political support for timber extraction rights will bring much revenue to Sarawak in the near term, whereas support for the biodiversity preservation rights may reduce such revenues available unless if politicians are directly compensated by the beneficiaries concerned. Politicians are likely to discount distant benefits to small present values due to the short term nature of political office and also the "income earned today can be productively invested in Sarawak's future, say in education and communication facilities..."; Wills, 1997, op. cit., p. 299.

¹³⁵ Wills, 1997, op. cit., p. 294.

¹³⁶ *ibid.*, p. 295.

With forest functions that are non-excludable, political decision makers have to rely on non-market signals from the various interest groups to estimate the value of these functions.¹³⁷ In Sarawak, the planner's sources of value information would come from political pressure on the Sarawak government by overseas and local beneficiaries. As these groups are unlikely to provide compensation for specifying rights to non-excludable forest functions, there may be limited incentives for politicians to focus on defining and enforcing rights to these functions. On the other hand, forest functions which have the characteristics of rivalry and excludability, and which are priced in markets, provide the planner with a clear source of information on its value.¹³⁸ This can be illustrated using timber. First, because timber is a rival and excludable good, property rights can be clearly specified for this function. Second, markets exist for pricing timber. Therefore, the production and consumption of timber is coordinated through market signalling and incentives. With clear signals existing for the value of timber, and excludability of benefits (in this instance benefits of timber accruing to the state and to politicians), it is rational for politicians to pay attention to specifying rights on timber. On the other hand, it is difficult to coordinate the use of forests as a whole because some functions are non-rival and non-excludable. Non excludability rules out exclusive property rights and markets. Since politicians do not have strong incentives to give equal weight to the interests of all forest interest groups, the non-market signals received by politicians are unlikely to coordinate the interest of all parties concerned about forest use.

The Role of Bureaucrats and the Specification of Property Rights

In VPE, bureaucrats are self-interested; they are not assumed to be entirely dedicated to the interests of the public; they are also motivated by their own considerations of expected gains (for example, to increase revenue collections), ideas,¹³⁹ patronage, discretionary power¹⁴⁰ and ease of management (Rowley in Foss, 1995).¹⁴¹ This disparity in interests has been termed 'bureaucratic shirking' by Jakee and Allen (forthcoming) in that bureaucrats'

¹³⁷ *ibid.*, pp. 296-297.

¹³⁸ If goods are rival and excludable, then there will probably be markets to signal information and incentives to the planner and users alike.

¹³⁹ In the case of Sarawak, this takes the form of forest management practices that are suited for the state, and the negative impression on shifting cultivation, etc..

¹⁴⁰ This refers to the power to providing and distributing commodities subject to their control.

incentives and actions diverge from that of the legislature. Bureaucratic shirking has also been discussed in Libecap (1989) who states that "bureaucrats are more than passive respondents to their interests. Bureaucratic agencies have independent concerns, including maintaining and expanding jurisdictional turf and budgets ..."¹⁴²

The origins of a positive theory of bureaucracy can be attributed to Niskanen.¹⁴³ Niskanen (1971) pointed out that bureaucrats are self interested and have the aim of maximising their personal utility at the expense of public interests. As Niskanen (1971) states:

Among the several variables that may enter the bureaucrat's utility function are the following: salary, perquisites of the office, public reputation, power patronage, output of the bureau, ease of making changes, and ease of managing the bureau.¹⁴⁴

Principal-agent problems¹⁴⁵ exist to the extent that bureaucratic activities are able to diverge from legislative mandates and public interest, because information and monitoring is costly (Jakee and Allen, forthcoming; Wills, 1997; Wintrobe in Mueller, 1997). It arises due to differences in information available (commonly termed information asymmetry)¹⁴⁶ to bureaucrats, and to other interested parties (politicians, private interest groups, and community groups). Although bureau spending can be monitored, there are substantial grounds for bureaucrats to pursue their own interests as output cannot be precisely measured or determined.¹⁴⁷ Because monitoring and penalising bureaucrats is costly, bureaucrats, like politicians, do not bear all the consequences of their actions. It is therefore important to consider the impact of bureaucratic shirking on the specification of

¹⁴¹ Rowley, op. cit., pp. 72-73.

¹⁴² Libecap, op. cit., p. 27.

¹⁴³ T.M. Moe, "The Positive Theory of Public Bureaucracy", in D.C. Mueller, *Perspectives on Public Choice: A Handbook*. United Kingdom: Cambridge University Press, 1997, p. 458.

¹⁴⁴ W.A. Niskanen, *Bureaucracy and Representative Government*. Chicago and New York: Aldine Atherton Inc., 1971, p. 38.

¹⁴⁵ Principal-agent problems occur because the agent is able to act in ways contrary to the interests of the principal. This arises due to the costs of monitoring which do not allow the principal to completely regulate or supervise the behaviour of the agent.

¹⁴⁶ Information asymmetry arises because information is not distributed evenly across groups or easily accessible by all groups interested in such information as it is costly to acquire such information. Information costs also arises from the costliness of monitoring the activities of bureaucrats (agent) in a detailed manner by politicians or interest groups (principal).

¹⁴⁷ Niskanen, op. cit., p. 42.

property rights as these factors constrain the enactment of policies set by the legislature and may distort actual rights enforcement from what is officially intended.

2.5 Social Coordination and Forests

Studies of forest use and management have considered some if not all of the economic concepts discussed above. Certainly, the importance of taking account of the full values (social and private) of the multiple functions of forests, and not only their timber content¹⁴⁸ have been acknowledged¹⁴⁹ (Barbier, 1993; Hyde, Amacher, and Magrath, 1996; Hyde and Newman, 1991; ITTO, 1994a; Panayotou and Ashton, 1992).

Studies of forest management implicitly incorporate the idea of social coordination when forests are viewed as multifunctional, with the concept of multiple use management recognising trade-offs associated with using the various forest functions (and their attendant costs and benefits).¹⁵⁰ Why some values have not been incorporated is not always explicitly stated in forestry management literature. Property rights specification is rarely studied in detail or in a systematic manner, as is undertaken in this thesis. However, Hyde and Newman (1991) recognise the idea of social coordination, when they mention property rights,¹⁵¹ stating that insecure rights encourage overexploitation and disinvestment.¹⁵² They also point to the tendency of concessionaires with short term horizons to harvest existing stands without considering future timber production potential.¹⁵³ Hyde, Amacher and Magrath (1996) point out that property rights to forest and forest products will be established only when the benefits exceed the costs of establishing and protecting rights.¹⁵⁴ The presence of such rights would correct distortions in the allocation of forests between

¹⁴⁸ This also includes charging loggers based on the economic rents (stumpage value) generated by timber. The rent obtained is far in excess of the costs of obtaining timber (harvest and delivery costs). Royalties and taxes to capture these rents are far below the rent of the forest; T. Panayotou, and P.S. Ashton, *Not by Timber Alone: Economics and Ecology for Sustaining Tropical Forests*. Washington, D.C.: Island Press, 1992, p. 63.

¹⁴⁹ *ibid.*, p. 69.

¹⁵⁰ *ibid.*, pp. 130-132.

¹⁵¹ W.F. Hyde, and D.H. Newman, (with a contribution by R.A. Sedjo), *Forestry Economics and Policy Analysis: An Overview*. Washington D.C.: The World Bank, 1991, pp. 33-36.

¹⁵² *ibid.*, p. 33.

¹⁵³ *ibid.*, p. 75.

¹⁵⁴ W.F. Hyde, G.S. Amacher, and W. Magrath, "Deforestation and Forest Land Use: Theory, Evidence, and Policy Implications", *The World Bank Research Observer* 11, No. 2 (August 1996), pp. 225-226.

commercial forestry and non-commercial forest functions.¹⁵⁵ Erosion control, biodiversity, and control of climatic change may have remained unresolved issues, as it is too costly for property rights to be established and enforced for such forest functions. The importance of secure property rights in eliminating problems involved in land use decisions and logging is also discussed in von Amsberg (1998).

The interaction between politics and economics in property rights specification is not often discussed in literature dealing with forestry management. Only Panayotou and Ashton (1992) specifically examine the role of property rights and politics in influencing incentives towards the use of forests.¹⁵⁶ As Panayotou and Ashton state:

The past mismanagement (or rather absence of management) of tropical forests has its roots in the prevailing institutional arrangements that determine who owns and controls the use of the forest, and who has access to and uses the products of the forest.¹⁵⁷

As a result of governments' inability to uphold their ownership and enforce related forest laws, tropical forests have reverted to quasi-open access with pervasive encroachment, squatting, log poaching, slash-and-burn (shifting cultivation), and illegal forest conversion to other uses. At the same time, governments award concessions to logging companies on truly concessionary terms and fail to adequately enforce harvesting and replanting regulations. Logging companies operating under short-term concession agreements, without assurance of renewal and with constant threats of encroachment and poaching, adopt hit-and-run strategies, since they have no incentive to preserve the long-term productivity of their concessions. The result is a pervasive climate of lawlessness, uncertainty, and insecurity of tenure for all parties (government, logging companies, squatters, and local communities) ...¹⁵⁸

However, most forestry literature focuses on problems in valuing forest functions. Attaining a socially optimal level of benefits in the use of forests from a multiple use perspective involves maximising the net present social value of forests after attaching values to forest functions that are important to society, and then evaluating alternative

¹⁵⁵ *ibid.*, p. 239.

¹⁵⁶ Panayotou and Ashton, *op. cit.*, pp. 4-5.

¹⁵⁷ *ibid.*, p. 198.

¹⁵⁸ *ibid.*, p. 199.

trade-offs.¹⁵⁹ The optimal forest allocation is one that maximises the net present value, including all relevant social costs and benefits associated with the various uses of forests.¹⁶⁰ This requires valuation of all marketed and non-marketed forest functions.¹⁶¹

The ITTO (1994a)¹⁶² study on the management of forests in Malaysia, Indonesia, Thailand, Philippines, and Papua New Guinea does not mention property rights and incentives explicitly, but it emphasises the need for forests to be "managed" for both their tangible and intangible values, which invariably provides signals and incentives important in coordinating the use of forests.¹⁶³ The ITTO study also points out that forest functions should be linked to the interest of various groups, as this would enable a more accurate analysis of forest management issues. In the ITTO study, the value of non-marketed forest products was estimated using a variety of surrogate estimate techniques.¹⁶⁴ The importance of valuation also finds support in Pearce (1991).¹⁶⁵ Pearce points out that not all functions enter into the decision makers' calculus to determine forest land use: the wider environmental values are often neglected.¹⁶⁶ The "Total Economic Value" (TEV) of forests needs to be determined before decisions about the use of forests can be made.¹⁶⁷ TEV includes direct-use values,¹⁶⁸ indirect-use values,¹⁶⁹ option values,¹⁷⁰ and existence values.¹⁷¹

¹⁵⁹ *ibid.*, p. 135.

¹⁶⁰ *ibid.*

¹⁶¹ *ibid.*

¹⁶² The data used in this study for estimating the costs and benefits of managing forests, from a multiple function perspective, is based on information from a Malaysian scenario. The data available in this study is also very useful for that of Sarawak which is in Malaysia.

¹⁶³ *Economic Case for Natural Forest Management: Main Report*. Japan and Malaysia: ITTO and FRIM, December 1994a, p. 2.

¹⁶⁴ For example, the cost of purchasing similar medication available commercially or expenses spent in clinics were used to estimate the medicinal value of some forest products; *ibid.*, p. 50. Other methods for estimating the value of the various forest goods and services include contingent valuation methods and travel cost methods; *ibid.*, p. 41.

¹⁶⁵ D. Pearce, "An Economic Approach to Saving the Tropical Forests", in D. Helm, editor, *Economic Policy Towards the Environment*. UK: Blackwell Publishers, 1991, pp. 240-241.

¹⁶⁶ *ibid.*, p. 242.

¹⁶⁷ *ibid.*

¹⁶⁸ For Pearce, this consists of sustainable timber, non-timber products, recreation, medicine, plant genetics, education, and human habitat; *ibid.*, p. 243.

¹⁶⁹ This consists of nutrient cycling, watershed protection, air pollution reduction, and micro-climate; *ibid.*

¹⁷⁰ Future uses of direct-use and indirect-use values; *ibid.*

¹⁷¹ Intrinsic value of forests, bequest values, gift to others, and as a responsibility (stewardship). This includes cultural and heritage values; *ibid.*

Forest function valuation has been attempted in the course of cost-benefit analysis, again discussed in Panayotou and Ashton (1992). This involves a decision maker attaching values to all forest functions (some derived directly from markets and some estimated using a surrogate value approach).¹⁷² The net present values of alternative courses of action can then, in principle, be derived by cost-benefit analysis, enabling a forest "manager to arrive at the most efficient allocation of resources."¹⁷³ In practice, there are difficulties involved in valuing some functions, especially when there are no markets and prices for some forest functions. Shadow pricing, which involves adjustment of market prices for distortions or obtaining surrogate prices in missing markets, is then used.¹⁷⁴

2.6 Analytical Framework: Conflicts and the Specification of Property Rights

Utilising economic concepts and ideas discussed in the preceding sections, an analytical framework to examine forest use conflicts will now be presented. The framework focuses on the importance of property rights definition and enforcement in coordinating the allocation of forest functions. The analysis of property rights definition and enforcement and economic barriers to specifying rights is based on the discussion of costs of property rights set out in Table 2.1 of Section 2.3.2 above. With respect to political barriers to property rights specification, the analysis is based on the demand-supply approach provided by Alston in Alston, Eggertsson, and North (1996) and the literature discussed in Section 2.4.

Testing the hypotheses in section 1.4 of Chapter One proceeds in four stages. The first stage involves identifying the forest functions valued by the various groups interested in Sarawak's forests (part a of the analytical framework). The second stage involves examining the extent of definition and enforcement for each forest function (part b). The third stage examines whether ill-defined and -enforced forest property rights are due to the costs of definition and enforcement exceeding their benefits (part c). The fourth stage

¹⁷² This methods provide implicit values based on prices paid for similar goods which are marketed; *ibid.*, pp. 154-156.

¹⁷³ *ibid.*, p. 138.

considers public choice reasons for ill-specified property rights in terms of a demand-supply approach (part d).

Stage One: Forest Function and Interest Groups [First Hypothesis]

a. Identification of Forest Function and Interest Groups

Part a requires an identification of forest functions and important groups interested in the various forest functions in Sarawak. This is necessary because conflicts arise when there are unclear or unenforced rules to guide groups of forest users. Part a is a prerequisite to the testing of the first hypothesis in Section 1.4. Part a is also based on Section 2.2 which discusses the economic theories of coordination. Identifying forest functions and groups interested in particular functions sets the scene for analysing social coordination issues and conflicts arising between important interest groups.

Stage Two: Definition and Enforcement of Property Rights [First Hypothesis]

Parts b (i) to b (iii) are based on activities listed in Table 2.1 of Section 2.3.2, which provides a systematic approach for examining the definition and enforcement of property rights for environmental resources. There are, however, some differences between the approach in Table 2.1 and part b. Unlike Table 2.1, part b makes a clearer distinction between definition and enforcement activities. b (i) and b (ii) are concerned with definition while b(iii) is concerned with enforcement. For example, while the setting of penalties can be considered a definition activity, the imposition of a penalty on violators is an enforcement activity. Again, the recognition (in legislation) of the right to delineate forested areas for a particular purpose (exclusion) is classified as a definition activity, but the act of demarcating boundaries is classified as an enforcement activity.

¹⁷⁴ Panayotou and Ashton, op. cit., p. 139. For a review on methods of shadow pricing see M. Munasinghe, *Environmental Economics and Valuation in Development Decisionmaking*. Environment Working Paper No. 51, Washington DC: The World Bank, 1992.

b. (i) Definition of Property Rights: Identification (Recognition) of a Particular Function in Legislation

It is important, first, to determine if each of the forest functions identified in part a has had its importance recognised in legislation. This involves examining processes in legislation which allow for the formal establishment (constitution) of forests for a particular function, including formal recognition of native customary rights. Information and incentives to coordinate the use of forests will be inadequate if forest functions have not been identified or are incompletely recognised in legislation (property rights are missing). This is linked to the discussion in Sections 2.2 and 2.3, particularly to Wills (1997) who emphasises the importance of property rights definition and enforcement in signalling and incentive systems to coordinate resource use.

b. (ii) Definition of Property Rights: Identification of Right Holders, Precise User Rights and Detailing of Penalties in Legislation

Again, in line with the first hypothesis in Section 1.4, definition includes not only identifying forest functions in legislation as per part b (i), but a further examination of the exact nature of property rights definition for each forest function. Sarawak legislation will be examined for evidence on the identification of right holders, details of precise user rights in particular areas (right to use, derive income, transfer, and exclude), and on the existence of penalties for the violation of rights.

b. (iii) Enforcement of Property Rights: Monitoring or Supervision of Forest Users and Users, Demarcation of Boundaries, and Imposition of Penalties

Strict enforcement of property rights is a necessary prerequisite for social coordination (Wills, 1997). Part b (iii), which is also part of the first hypothesis, is based on the property rights literature discussed in Sections 2.3.1 and 2.3.2, which emphasises the importance of enforcement in social coordination. Evidence will be considered from forestry reports, and other published sources to identify the extent of enforcement in Sarawak. This includes details of fencing and boundary demarcation in forests, and details of monitoring of all forested areas (including supervision on logging operators) by the Sarawak Forest Department, designed to exclude non-authorised users and uses. Evidence

of penalties imposed on illegitimate forest uses in all forest areas, including timber concessions, and actions by the Forest Department to penalise infringements will also be studied.

Stage Three: Economic Barriers in Defining and Enforcing Property Rights [Second Hypothesis]

c. (i) Definition Costs: Identifying Areas, Uses and User Rights

Economic barriers to property rights specification arise when activities to define and enforce property rights are costly relative to benefits. This is in line with the second hypothesis in Section 1.4 of Chapter One, which points to the link between the costs of specifying property rights and social coordination, discussed in Section 2.3.2. For definition, information on the costs of completely identifying forested areas for various purposes will be obtained from published forestry sources. Cost figures include expenditure on ground surveys which would also identify (detect) pre-existing native rights in forests. Ground surveys would serve to identify users (present and prospective) and determine the user rights detailed in legislation. Definition may also include measuring and quantifying benefits in a particular forested area through inventories of forest resources.

c. (ii) Enforcement Costs: Monitoring and Penalising

Information on monitoring costs to exclude illegitimate users and uses (including the supervision of logging activities to ensure adherence to regulations), and the costs of demarcation and maintenance of forest boundaries and penalising unauthorised uses of forests through on-the-spot fines or conviction in courts will be obtained from forestry reports and other published sources. These activities may incur specification costs that outweigh benefits. This again relates to the second hypothesis and the literature on specification costs in Section 2.3.2.

Stage Four: Political Barriers in Defining and Enforcing Property Rights [Third Hypothesis]

d. Demanders and Suppliers of Property Rights

Political barriers exist in instances where property rights to forests have not been fully defined and enforced even when the benefits of specification exceed costs. Then the economic motivations (based on decision makers' information and incentives) of interest groups and political decision makers need to be scrutinised to explain the stance taken on property rights specification. This is related to the third hypothesis in Section 1.4 of Chapter One. The motivations of interest groups and political decision makers in specifying rights were discussed in Section 2.4 of the literature survey. The analysis here deals with factors affecting the demand and supply of property rights specification; it is based on the framework propounded by Alston in Alston, Eggertsson, and North (1996).

Demand Side:

d. (i) Motivation for Collective Action

Interest group demands for a respecification of rights stem from increases in expected benefits that can be captured via a creation or modification of rights in a particular resource. Collective action by groups interested in the use of forests to respecify rights for a particular forest function is spurred by shifts (increases) in the value of a function (Libecap, 1989). Existing interest groups are galvanised into taking action, or new groups are established to take concerted action to protect their interests in forests.

d. (ii) Collective Action and the Strength of Demand

Groups of individuals organise themselves collectively to safeguard their interests by operating through organisations that have been established elsewhere, or establishing completely new organisations to lobby for their concerns and to pressure politicians and bureaucrats into respecifying property rights in group interests. This relates to the third

hypothesis and the discussion in Section 2.4.1. All things equal, lobbying becomes more significant if a large number of individuals can organise cooperatively to present their concerns to politicians and bureaucrats.

In line with the demand for property rights respecification, the effectiveness of group demand is examined for one or more of the following factors which influence the strength of demand: the size of an interest group (organisation), wealth, network of links with other groups, number of years established, leadership skills, and the concentration of benefits to groups and to individuals in a group.

Non-excludability of a forest function benefit can give rise to free riding, which dilutes demand. The concentration of benefits to individuals within a group helps to overcome free rider behaviour. The spatial distribution of benefits also affects the costs of coordination which again dilutes demand.

Supply Side:

d. (iii) Objective Function of Politicians and Bureaucrats

Politicians supply respecified property rights when it enhances their objectives of staying in power, or of maximising support (Libecap, 1989). The interests of bureaucrats differ from those of politicians (Niskanen, 1971). Rights will be enforced by bureaucrats to the extent that the objective of increasing their bureau size (budgetary allocation, and staff size) is enhanced. This is part of the third hypothesis in Section 1.4. In this respect, the information and incentives faced by politicians and bureaucrats are important in determining the supply of property rights specification.

Evidence will be obtained to study the behaviour of Sarawakian politicians and bureaucrats, and the information and incentives they face in supplying particular property rights specifications, emphasising the establishment and enforcement of rights that enhance political and bureaucratic objectives, in particular rights to timber. Nevertheless, politicians and bureaucrats will also consider non-timber rights, to the extent that

ignorance of such concerns may result in a reduction of popular support (votes) or reduction of timber revenues and profits (for example, via timber bans imposed by developed countries due to negative publicity generated by private interest groups).

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Local benefits will be given a greater priority as reactions from local groups translates more directly into impacts on the objective functions of politicians and bureaucrats (via shifts in support or votes for competing political parties which show more empathy towards local groups' concerns).

Forest functions with excludable benefits that directly enhance the objective function of politicians and bureaucrats will be given a higher priority over those with more diffuse benefits. Excludable benefits will be signaled in commercial markets (eg. timber), while non-excludable benefits are unlikely to be signalled in markets, so that politicians are more likely to respond to the former than the latter.

2.7 Research Methodology and Data Sources

The initial plan of this research was to test the hypotheses using published materials from Singapore, Kuala Lumpur, and Sarawak, supplemented by interviews with government officials and forest interest groups in Sarawak, in particular, forestry officials in Kuching, Sibu, and Miri, native groups, concessionaires, environmental groups, and researchers in this field. The major aim of these interviews was to obtain detailed information about forest property rights definition and enforcement, and the attendant costs of specifying rights. Interviews were initially thought to be necessary because published data on rights definition and enforcement were believed to be limited. They were therefore expected to reveal practical problems involved in defining and enforcing property rights to some forest functions and the cost constraints faced by the Sarawak Forest Department in monitoring and penalising groups that contravene forestry legislation.

In order to conduct any form of research in Sarawak, it is necessary to obtain a research permit from the State Planning Unit. A research proposal detailing the logistics and nature

of the research was subsequently written and sent to the Sarawakian authorities. Permission was however not granted by the Sarawakian authorities. While waiting for a reply, a deeper search into the electronic catalogues of libraries in Malaysia and Singapore was conducted to ascertain the availability of published information on the specification of rights. Such searches revealed numerous discussions of forest management by Sarawakian foresters dealing with the definition and enforcement of forest property rights and their costs. Library sources include Malaysian Forestry Conference Papers (various years), and also the various UNDP/FAO, Sarawak Forest Department reports and NGO studies. Also, the research division of ITTO supplied publications dealing with the specification of forest property rights in Sarawak.

After consultation with researchers familiar with Sarawak, the data collection procedures were changed to rely mainly on reports and source materials available in libraries and archives in Singapore, Kuala Lumpur, and Sarawak. Specialist libraries included the Institute of Advanced Studies Library (Perpustakaan Institut Pengajian Tinggi), Main Library (Perpustakaan Utama), and Law Library (Perpustakaan Undang Undang) in Malaya University; Forest Research Institute of Malaysia (FRIM) Library; the Institute of Strategic and International Studies (ISIS) Library; and the Kuching Forest Department Library in Sarawak. In addition, information on enforcement of rights was also collected from the WWF (World Wide Fund for Nature) Library in Kuala Lumpur, and the Central Library and Law Library at the National University of Singapore.

Personal observations and field notes made while travelling in Sarawak helped to verify and supplement information from published sources. For example, while travelling through the major rivers in Sarawak (Lower Rejang and Lower Baram Rivers), it could be ascertained that the waters were turbid and that there were loose logs floating in these rivers; some of which were dangerously large. Furthermore, there were also kilometers of logs piled along parts of these rivers, including rotting logs; all of which have been deemed unexportable. An impression on how national parks were managed was gathered through a visit to the Bako National Park in Kuching; here the diverse flora and fauna in just one part of Sarawak's forests was enough to leave a lasting impression of the beauty of plant and animal diversity, and on the importance of conservation, even from an

aesthetic point of view. Personal observations of markets in Kuching, Sibul, and Miri also revealed the diverse handicrafts and forest produce sold in these markets by natives. And a visit to the Sarawak Museum and the Sarawak Timber Association (STA) Museum further confirmed the importance of forests to native groups in Sarawak, and also the importance of timber to state government's revenue.

The modified research methodology proved more fruitful than expected, due to the large amount of information available in Malaysian and Singaporean libraries. There are, of course, limitations in pursuing research utilising these materials, as data in published materials were rarely collected for the purposes directly related to this thesis. Where such gaps or limitations in information exist, they are noted. The following sections discuss the data sources for the four stages of the research set out in 2.6.

2.7.1 Stage One: Identification of Forest Functions and Data Sources

The discussion in Chapter One and section 2.5 in this chapter emphasises the need to consider forests as a multifunctional resource which satisfies diverse needs of the local and international community. Forests functions need to be identified before analysing coordination in the use of forests. The first stage involves the identification of forest functions considered important by the various interest groups. The value of forests for native shifting cultivation, livelihood, and subsistence were identified from: anthropological studies contained in *The Sarawak Museum Journal*, the *Borneo Research Bulletin*, the *Sarawak Gazette*, Hong (1987), Parnwell and Taylor (1996), and Taylor, Hortin, Parnwell, and Marsden (1994); official reports from the Sarawak Forest Department discussing the importance of forests to natives; interviews by ITTO (1990) with the various native groups throughout Sarawak, and Sahabat Alam Malaysia (SAM: Malaysian Branch of the Friends of the Earth) environmental publications on the impact of logging on native livelihood. The importance of forests for commercial timber production was substantiated using Forest Department Reports, including its Annual Reports, Bugo (1995) which discusses the importance of timber to Sarawak, ITTO (1994c) which discusses operational aspects of the labour force in Sarawak's Forest Department, and Bevis (1995) and Lian (1990), who discuss aspects of the forest concession system in Sarawak. The importance of Sarawakian forests' biodiversity was documented from

several Worldwide Fund for Nature (WWF) and International Tropical Timber Organization (ITTO) reports which discuss the importance of conservation in Sarawak: in particular, Kavanagh (1985) and ITTO (1990) discuss the importance of forests in conserving plant and animal diversity and WWF (1985), the importance of a conservation strategy in Sarawak. Other WWF works covering specific aspects of diversity are Bennett (1989), on mangrove swamps and the proboscis monkey, Pearce (1990), on palm utilisation and conservation, Rajaratnam (1992), on wildlife diversity in the Samunsam Wild Life Sanctuary, and Caldecott (1986) on hunting and forest habitats. The importance of forestry cover in preventing soil erosion and catchment functions is drawn from discussions in ITTO (1990), WWF (1985), and Ekran (1995). Lastly, the recreational and tourism functions of forests are documented in Malaysian Forestry Conference Papers (Morshidi, 1976; Bujang and Sandi, 1992) and the *Sarawak Gazette* (Hon, 1990).

2.7.2 Stage Two: Evidence of Definition and Enforcement of Property Rights

The second stage of the research focuses on the definition and enforcement of property rights for each forest function. Definition involves inspecting legislation and scrutinising the detailed evidence of the definition of rights that relates to each forest function. This was undertaken by examining legislation in the *Sarawak Government Gazette* (inclusive of updates); notably, the Forests Ordinance (Sarawak Cap. 126) 1954, the Land Code (Sarawak Cap. 81) 1958, National Parks Ordinance (Sarawak Cap. 127) 1956, Wild Life Protection Ordinance (Sarawak Cap. 128) 1958, and the Natural Resources and Environment (Amendment) Ordinance (Sarawak Cap. 84) 1994.

Collection of evidence on the enforcement of legislation involves searching court records for instances when court enforcement has occurred, and for published evidence of failures by the relevant authorities to enforce property rights. Information related to monitoring, exclusion, enforcement, and penalising activities for the various forest functions was also obtained from Malaysian and Sarawak Forest Conference Research Papers (various years), which provided information detailing enforcement activities related to the commercial timber, biodiversity and shifting cultivation functions of forests. The ITTO reports provided information on enforcement activities in relation to the commercial timber,

native subsistence foods, soil erosion and water catchment, and biodiversity functions of forests. WWF (World Wide Fund for Nature) reports have provided information on enforcement activities related to the biodiversity function. The Sarawak Forest Department Reports, Sarawak Forest Department Annual Reports (1960-1992), and the *Sarawak Gazette* provided information on enforcement problems in relation to timber, shifting cultivation, and the biodiversity functions of forests. Other sources of enforcement information included Government Reports, articles from the *Borneo Research Bulletin*, theses, published monographs, Sahabat Alam Malaysia (SAM), Institute of Social Analysis (INSAN), and newspapers (taken from NEXIS, internet, and newspapers proper).

2.7.3 Stage Three: Costs of Defining and Enforcing Property Rights

The third stage involves identifying the costs of rights specification in cases where either the definition of property rights was incomplete or where enforcement was lacking for some forest functions.

The specification of rights to forest functions involves activities that are costly: costs of identification, measurement, exclusion and penalising of offenders as outlined in the analytical framework. If these activities are too costly, relative to the value of the forest function, property rights will not be well specified. Information on specification costs for the various forest functions was drawn from several ITTO reports, notably ITTO (1994a), from UNDP/FAO (Food and Agricultural Organization) studies on forestry management in Sarawak, and from Sarawak Forest Department Reports, Malaysian and Sarawak Forest Conference Research Papers (various years), and Sarawak Forest Department Annual Reports (1960-1993). Most of these sources contain information on specification costs related to more than one forest function. However, there are some gaps, for example, there was limited information on the costs of defining rights to forest biodiversity in the Sarawakian forests. In such instances, data were obtained from forest situations elsewhere in Malaysia, which are very similar to those of Sarawak. Other data gaps will be discussed in the relevant sections of Chapter Five.

2.7.4 Stage Four: Public Choice Issues of Defining and Enforcing Property Rights

As discussed in Section 2.4, the specification of property rights depends on political choices made by politicians (and bureaucrats), as well as on the costs of specification. If such costs were not high relative to benefits, and rights are unspecified or poorly specified, then public choice factors affecting the definition and enforcement of rights need to be examined. This is undertaken in Stage Four.

An examination of public choice issues involves examining first the intrinsic attributes of the benefits of forest functions to identify their spatial distribution and excludability. Evidence on the spatial distribution is obtained from Stage One. The likelihood of effective collective action by the various interest groups is assessed by examining the likely costs of collective action based on size of organisation, local grassroots support from native groups, wealth, network, number of years established, leadership, and the concentration/diffusion of the benefits and costs. Information on factors that influence the costs of collective action was obtained from publications from the relevant interest groups or general studies on these groups. Examples of such sources include Chala (1993), Jawan (1994), Tan (1994, 1997) who provide information pertaining to costs of collective action by native organisations in Sarawak; ITTO (1990) on timber concessionaires; Chala (1993), and *The Battle for Sarawak's Forests* (1990) by Sahabat Alam Malaysia and the World Rainforest Movement, SAM (1990) on Sahabat Alam Malaysia; Colchester (1993a), ITTO (1990), and Kasimbazi (1996) on the International Tropical Timber Organization; Kavanagh, Rahim and Hails (1989), Mok, Jalil, and Jiwan (1991), WWF (1985) on the World Wide Fund for Nature Malaysia.

Information on the benefits and costs of property rights specification to politicians is obtained from Sarawak Forest Department Reports and the Malaysian and Sarawak Forest Conference Research Papers (various years). Benefits and costs faced by politicians are influenced by the forest function in question, its spatial distribution, its excludability, and the sources of information available to the planner. Information on the interests of Sarawak's politicians was obtained from political and general studies on Sarawak (Arentz, 1996; Bugo, 1995; Chala, 1993; Colchester, 1993b; Dauvergne, 1997; Hong, 1987; Jawan,

1994; King, 1993; Lian, 1987; US House of Representatives, 1989; Wee, 1995, Yu, 1987) from regional newspapers, and also from the ITTO (1990, 1994c), which discusses the management of Sarawak's forests.

Chapter Three

Identifying Forest Functions in Sarawak

3.1 Identifying Forest Functions: Introduction

In line with part a of the analytical framework in Section 2.6, forest functions and groups interested in particular functions will be identified in this chapter.

Forests comprise over ninety percent of Sarawak's land area. The use of forests for a particular purpose has positive and negative impacts on different groups inside and outside Sarawak. Sections 3.2.1 to 3.2.7 identify important forest functions and discuss the significance attached by the various interest groups to these functions. Section 3.3 summarises.

3.2 Forest Functions and Groups Interested in Forests

Not all forest functions considered significant elsewhere are of equal importance in Sarawak. For example, because entire forested areas in Sarawak are modest compared to that of total forested areas in other regions, the function of forests in sequestering carbon in Sarawak, which modifies global greenhouse gas emissions, is not considered to be of great significance in the region. Thus, this function is omitted from the discussion here. Nevertheless, most forest functions considered important elsewhere are also of significance in the context of Sarawak. The following sections identify individual forest functions and the respective groups interested in each.

3.2.1 Commercial Timber and Logging

Timber is an important source of revenue mainly for the Sarawak government (and for the Sarawak Forest Department),¹ and a source of income for concessionaires, timber contractors, sub-contractors, and, to a very small extent, native communities (*Annual Report of the Forest Department Sarawak, various years*; Bugo, 1995; Cleary and Eaton,

¹ Royalties and export charges.

1992; ITTO, 1990). Malaysia is the world's largest exporter of tropical logs,² and the state of Sarawak alone has contributed around forty percent of the total output since the late 1980s, increasing to around fifty percent in the 1990s.³ Timber is the second largest export earner next to petroleum in Sarawak, comprising around twenty seven percent of the total export earnings of the state in the 1990s.⁴ Unlike petroleum, of which Sarawak only gets a royalty of five percent of its gross value, total revenues (from royalties, levies, and fees) collected from timber production and timber exports accrue entirely to the state.^{5 6}

Timber revenues are important in allowing the government to sustain its diversification goals, allowing it to demonstrate in a visible manner that it is pursuing the positive gains that come with a broader base comprising manufacturing, services, and agriculture. This also serves to "legitimise" its role in winning the right to govern, and to encourage the continuation of voter support. In the 1980s and 1990s, the state's government plans emphasised expanding the manufacturing and service sectors, with the development of downstream industries to process timber, petroleum, and gas (Bugo and Solhee, 1989; Bugo, 1995). Permanent Secretary of the Ministry of Resource Planning, Bugo, stated that timber is to form "the backbone of the industrialization program intended to bring about structural change in the economy."⁷ The aim was to restructure the economy, with a reduction of dependence on primary commodities and at least twenty percent of state GDP coming from manufacturing.⁸ Bugo reports that timber had provided on average 47 per cent of the state revenue needed to finance its development programmes for the years 1988-1991,⁹ and adds that:

² *Economic Case for Natural Forest Management: Country Reports*. PCV (VI)/13 Volume II. Japan and Malaysia: ITTO and FRIM, October 1994b, p. 4.

³ Information obtained from the Malaysian Timber Council, 1997 Statistic on Timber Industries, "Malaysia: Production of Logs", <http://www.mtc.com.my/statistic/stat97/8-6.html>, no date, on 26 June 2000. Statistical data for earlier years (1980-1991) is available in ITTO (1994b), *ibid.*, p. 22.

⁴ Petroleum accounted for an average forty-seven percent of the total export earnings of the state for the 1990s. See Appendix 1.1 in Chapter One of this thesis.

⁵ C.H. Wee, *Sabah and Sarawak in the Malaysian Economy*. Malaysia: Institute for Social Analysis (INSAN), 1995, p. 24.

⁶ From the late 1980s, timber revenues have constituted on average forty-seven percent of the total state revenues while the contribution of petroleum has been below twenty percent of state revenue.

⁷ H. Bugo, "The Significance of the Timber Industry in the Economic Development of Sarawak", in R.B. Primack, and T.E. Lovejoy, eds., *Ecology, Conservation, and Management of Southeast Asian Rainforests*. New Haven and London: Yale University Press, 1995, p. 229.

⁸ Bugo, 1995, *op. cit.*, p. 234.

Timber is a strategic resource for Sarawak's industrialization program, its importance supersedes that of crude oil and gas. Timber-related industries are most likely to provide a jump start for the government's ambitious development program. Development cannot take place without capital for building roads, factories, and communications infrastructure; the state government views timber as the best source of the income needed for initial startup costs.¹⁰

Evidence of the emphasis placed on timber can be seen by government initiatives to promote downstream processing. The paid-up capital for wood-based manufacturing industry increased from RM 4.2 million in 1981 to RM 3.1 billion in 1990.¹¹ In the 1990s, thirty eight percent of logs were set aside for local processing; this is targeted to increase to fifty percent by 2000.¹² In recent years, a number of industrial estates have been set up by the government mainly for timber processing, notably the Tanjung Manis Timber Processing Zone¹³ and the Kemena Industrial Estate in the early 1990s.¹⁴ The importance of timber exports and revenues to Sarawak can be seen in Appendix 3.1, which provides information on such from 1981 to 1995.

Another group interested in timber is the Sarawak Forest Department. The establishment of the Sarawak Forest Department in 1919 was in part to manage and conserve forest resources, and to maximise revenues in line with sustained yield. The emphasis of the Sarawak Forest Department on timber is understandable because of the revenue generated from logging royalties and taxes reflects on its management capabilities as a bureaucracy. Furthermore, its budget for its operating and development expenditure, and also its level of staffing is implicitly dependent on revenues collected from timber. This is because of the emphasis of the Public Services Department (PSD) on trimming the size of its public sector throughout Malaysia.¹⁵ Extreme drops in revenue would therefore provide a basis

⁹ *ibid.*, p. 236.

¹⁰ *ibid.*, p. 230.

¹¹ *ibid.*, p. 237.

¹² Information obtained from the Sarawak Forest Department, *Forestry in Sarawak*, <http://www.forest.gov.my/future.html>, no date, on 8 September 1997; and see also P. Dauvergne, *Shadows in the Forest: Japan and the Politics of Timber in Southeast Asia*. Cambridge, Massachusetts: The MIT Press, 1997, p. 119.

¹³ "Timber Industries Along the Rejang", *Perkasa* 10, No. 3 (September 1992), p. 10.

¹⁴ "Kemena Industrial Estate: Pride of BDA", *Perkasa* 11, No. 1 (March 1993), p. 14.

¹⁵ International Tropical Timber Organization (ITTO). *Pre-project Report: Manpower Development of Sarawak Forest Sector*. Ref No.: PCI(VII)/7. Prepared by the Forest Department, State Government of Sarawak, Malaysia, 1994c, p. 76.

for cutbacks in the budget and operating expenditure and size of the Sarawak Forest Department.

Consistent with the importance of maximising forest revenues, the Forest Department emphasises staffing to prevent the evasion of royalties and taxes. ITTO (1994c) reports that the orientation of field staff has always been towards "activities associated with the revenue function" of forests; it estimated that around eighty percent of time and effort of field staff was devoted towards the revenue generating capability of timber in forests.¹⁶ In addition, increases in the staffing levels since the early 1990s, have been devoted to strengthening the enforcement side of regulations in the areas of log distribution and prevention of royalty evasion.¹⁷ ITTO agreed that the emphasis on the timber function of forests is natural because of the revenue; however, there is a need to consider the "non-wood" services in forests, notably wild life services.¹⁸

The emphasis on timber is also demonstrated by the Forest Department's research focus on developing the timber potential of forests. From the 1960s to 1990s, the majority of the research carried out by the Forest Department has been concerned with improving the quality and value of various timber species present in forests.^{19 20} The continuing emphasis on timber has remained (ITTO, 1990).²¹

The potential of the timber industry in generating employment for native communities in rural areas has also been long recognised (Senada, 1977). Logging is one of the major economic activities that has created employment opportunities for rural Sarawakians.²² However, timber workers of native origin receive only a small percentage of the total gross income from the sale of timber. Lian (1990) pointed out that timber workers earned less

¹⁶ *ibid.*, p. 32.

¹⁷ *ibid.*

¹⁸ *ibid.*, p. 50.

¹⁹ See also *Forestry In Sarawak Malaysia*, Kuching, Sarawak: Forest Department, 1991, p. 29.

²⁰ *Annual Report of the Forest Department Sarawak, 1993*, pp. 15-21.

²¹ International Tropical Timber Organization (ITTO), *Report Submitted to the International Tropical Timber Council by Mission Established Pursuant to Resolution 1 (VI) "The Promotion of Sustainable Forest Management: A Case Study in Sarawak, Malaysia"*. ITTC (VIII)/7, 7 May 1990, p. 54.

²² D.A. Senada, "Role of Forestry in the Socio-Economic Development of Rural Populations in Sarawak", *Proceedings of the Sixth Malaysian Forestry Conference* (Vol. 1), Kuching, Sarawak, 11-17 October 1976, p. 133.

than four percent of the total gross income although they comprised 95 percent of the total workforce in the timber industry.²³ Seventy percent of native workers earned RM 700 per month and below, with 42.7 percent earning RM 500 per month or less.²⁴ Nevertheless, income earned from timber is higher than that from other sources, and above the income necessary to cater for the basic requirements (income level of the "hard core" poor in Sarawak) of society which was RM 452 per month in 1990 currency.^{25 26}

The importance of timber income relative to non-timber income is documented in Nicolaisen (1986). A survey of Sekapan households revealed that more than forty percent of the cash income came from timber companies. Thirty four households earned an average income of RM 2,918 per annum or RM 243 per month. Income from hunting and fishing provided thirty one per cent of the total cash earnings of households. Nicolaisen, however, suggests that the Sekapan have had to rely on timber income precisely because of a reduction on the availability of forest products caused by extensive logging in Sarawak.²⁷

Forests are valued by concessionaires²⁸ and logging companies²⁹ for their potential commercial timber content. Up to the end of 1992, a total of 7,831,335 hectares (ha) of forests have been licensed for logging, representing 95 per cent of Sarawak's forested

²³ F.J. Lian, "The Timber Industry and Economic Development in Sarawak: Some Contemporary Trends and Proposals for 1990 and Beyond", in A.M.M. Salleh, H. Solhee, and M.Y. Kasim, eds., *Socio-Economic Development in Sarawak: Policies and Strategies for the 1990s*. Proceedings of a Seminar held at Kuching, Sarawak, October 10-12, 1988, Kuching, Sarawak: Angkatan Zaman Mansang (AZAM), 1990, p. 123.

²⁴ F.J. Lian, *Farmers' Perceptions and Economic Change - The Case of Kenyah Farmers of the Fourth Division, Sarawak*. Unpublished PhD Thesis, Australia: Australian National University, July 1987, p. 187.

²⁵ *ibid.*, pp. 187-188.

²⁶ In 1990, the incidence of poverty was 21 percent in Sarawak. (Incidence of Poverty=Number of Poverty Households/Total Households) Poor households are those defined to have a gross income of RM 452 per month or below. The incidence of hard-core poverty was 11.1 percent. (Incidence of Hard-Core Poverty=Number of Hard-Core Poverty Households/Total Households) Hard-core poor households are defined as households with an income of RM 226 or less per month. See *Annual Statistical Bulletin Sarawak, 1991*. Department of Statistics Malaysia (Sarawak Branch), p. 160.

²⁷ More than forty per cent of the cash income came from timber companies and earned an average income of RM 2,918 per annum or RM 243 per month. See I. Nicolaisen, "Pride and Progress: Kajang Response to Economic Change", *The Sarawak Museum Journal XXXVI*, No. 57 (New Series) (December 1986), p. 98.

²⁸ Timber licence holders.

²⁹ In Sarawak, the right to harvest forests (licence) is vested in concessionaires although logging operations are in turn contracted out by the concessionaires to logging companies.

area.³⁰ Of this total, 3,762,410 ha have been commercially logged, with 4,068,925 ha still unlogged.³¹ Yields from Sarawakian forests are often lower than that of other tropical rainforest areas in the Philippines, Indonesia, and even Sabah. Sarawak, however, is one of the last areas in Southeast Asia which still contains sizeable amounts of primary forests³² and favourable prices have stimulated logging activity in Sarawak, especially in the 1980s and 1990s. Timber prices rose over fifty percent between 1981 and 1990. Appendix 3.2 indicates the estimated prices for timber in the 1980s, and the corresponding production of timber sawlogs is indicated in Appendix 3.3.³³

In order to fully understand different group interests in timber and logging, it is important to understand the manner in which timber licences are structured. The power to grant logging licences rests entirely with the Minister of Resource Planning (the position has been held by the Chief Minister since 1966). Licences are then issued by the Sarawak Forest Department to individuals or corporations. Licence holders are known as concessionaires. Timber leases previously lasted from ten to fifteen years, but in recent years this has been increased to twenty five years. While never officially stated, it is widely known that state politicians hold the rights to timber harvesting in Sarawak's forests (Arentz, 1996; Colchester, 1993; King, 1993; Javan, 1994; Leigh in Hirsch and Warren, 1998; Lian, 1989). In Sarawak, timber and politics are closely linked, and profits derived from timber are often used to further the causes of politicians (King, 1993).

Politicians in power often hold timber extraction rights, either directly through ownership of a corporation or indirectly through nominee shareholdings (Lian, 1987; Javan, 1994).

³⁰ This total of 8,245,981 ha of forested land includes Permanent Forests, Stateland Forests, and National Parks; *Annual Report of the Forest Department Sarawak, 1992*, p. i.

³¹ Calculated from *Annual Report of the Forest Department Sarawak, 1992*.

³² W.W. Bevis, *Borneo Log: The Struggle for Sarawak's Forests*. Seattle and London: University of Washington Press, 1995, p. 12, provides the following comparative figures: Sarawak on average provides 8 tons or less per acre, while Sabah yielded 15 tons per acre on average. In the Philippines, it was 60 to 70 tons per acre on average.

³³ It should be noted that this is only a rough indicator as there are many species of trees present in Sarawak and prices vary according the quality within each species and the extent to which the timber has been processed. See *Annual Report of the Forest Department Sarawak, 1992*, p. 60. The most important hill timber is Meranti, followed by Kapur, Keruing, and Selangan Batu. The most important swamp timbers are Alan, followed by Ramin, Jongkong and Meranti. See M. Kavanagh, A.A. Rahim, and C.J. Hails, *Rainforest Conservation in Sarawak: International Policy for WWF*. Malaysia: WWF Project No. 3262, Nov. 1989, p. 25.

Concessionaires consist mainly of *bumiputra*³⁴ politicians and prominent Chinese politicians, most of whom are in Sarawak's ruling political coalition. Concessionaires contract out the harvesting of timber to a main contractor. Contractors are predominantly ethnic Chinese Sarawakians from the Foo Chow dialect and are also prominent business individuals in the community (Chala, 1993; Leigh in Hirsch and Warren, 1998). To a lesser extent *bumiputra* individuals are beginning to engage in such tasks although they are still in the minority (Lian, 1987). The main contractor subcontracts some tasks (extraction, rafting, transportation) to a few sub-contractors. Sub-contractors again are also ethnic Chinese Sarawakians. Concessionaires, contractors, and sub-contractors are members of the Sarawak Timber Association (STA).

The importance of timber to concessionaires and especially to the main contractor should not be underestimated. The concession system is profitable; it has been estimated that profit per ha of forest can be as high as RM 21,000 for each harvest.³⁵ Although it is impossible to estimate precisely the division of profits among the concessionaire, the main contractor, and sub-contractors, the following studies suggest that the division may be around ten, thirty, and sixty percent respectively. Investigations by Lian (1990) in the Baram area have revealed that the concessionaire earned on average seven per cent of the gross income earned from the sale of logs with little or no active participation in the harvesting process itself.³⁶ Hurst estimates that concessionaires earned around five to ten per cent of gross income.³⁷ For the contractor, Lian estimated profits of between RM 160 and RM 200 for every ton of timber sold in Baram (excess of forty per cent); this depending on the region from which timber was harvested.³⁸ For the various subcontractors, Lian provided a profit figure of RM 2.00 to RM 20.00 for every ton (1.8 m³) of timber produced, depending on the nature of the task. The income accruing to timber workers on the other hand (ninety-five per cent of workforce) only comprised four per cent of the total gross income of the sale of timber. In the Belaga District, the Sarawak Study Group estimated that seventy-nine per cent of the total value of logs produced that

³⁴ In Sarawak, this consists of the Muslim indigenous people made up of the Malay and Melanau, while the predominantly non-Muslim indigenous people are the Dayak groups.

³⁵ More details are provided in Chapter Six.

³⁶ Lian, *op. cit.*, p. 122.

³⁷ P. Hurst, *Rainforest Politics: Ecological Destruction in South-east Asia*. London: Zed Books Ltd, 1990, p. 105.

accrues to the main contractor.³⁹ In a meeting with the ITTO (1990) mission, the Orang Ulu Native Association in Miri reported that around one-third of the profits before tax goes to the timber contractor.⁴⁰

3.2.2 Native Shifting Cultivation and Agriculture

The importance of shifting cultivation to native groups and the function of forests in performing this role cannot be understated. The various native groups (excluding Melanau) comprise forty per cent of the total population of 1.67 million (*Annual Statistical Bulletin Sarawak, 1991*).⁴¹ In the period under study, over eighty per cent of Sarawak's natives were living in rural areas.⁴² Most natives remain in their traditional territories on the hills and mountain slopes and on the fringes of secondary forest despite some out-migration into town and coastal areas (Bugo, 1995).

Forests are important as natives have close links to forests and the various functions or "services" provided therein, especially in the provision of areas for shifting cultivation (Bugo, 1995; Burgers, Nolten, Servass, Verhey, Grunsven, 1991; Dauvergne, 1997; Ekran, 1995; ITTO, 1995, 1996; Padoch and Peluso, 1996; Parnwell and Bryant, 1996; Rousseau, 1994). Seventy percent of natives are Iban while eighteen percent are Bidayuh. Nearly all native groups depend on the shifting cultivation of rice for the provision of their staple food.

Shifting cultivation in Sarawak involves the clearing of forests and the burning of remaining residuals or weeds. Farming activities have traditionally involved short periods of cultivation with long periods of forest fallow of fifteen years or more (rotation of fields rather than of crops).⁴³ The fifteen year fallow period still exists in some areas (ITTO,

³⁸ Lian, op. cit., p. 123

³⁹ Sarawak Study Group, "Logging in Sarawak: The Belaga Experience", in K.S. Jomo, ed., *The Continuing Pillage of Sarawak's Forests*, Second Edition, Malaysia: INSAN, 1992, p. 8.

⁴⁰ ITTO, 1990, op. cit., p. 164.

⁴¹ All native groups are collectively referred to as "Dayak".

⁴² J.A. Jawan, *Iban Politics and Economic Development: Their Patterns and Change*. Bangi: Penerbit Universiti Kebangsaan Malaysia, 1994, p. 155 and Dauvergne, op. cit., p. 106.

⁴³ J.D. Freeman, *Report on the Iban*. London School of Economics Monographs on Social Anthropology No. 41. London: The Athlone Press, University of London, 1970, p. 160.

1996). However, declining fertility of soils has reduced fallow⁴⁴ periods to an average of five years for some native groups in Sarawak (ITTO, 1995).⁴⁵

Shifting cultivation among the various native groups occurs more or less on the following time scale (Cramb, 1987, 1989; Freeman, 1970; Sutlive, 1992). The agricultural year begins in April, and families start clearing forested areas (primary or secondary forests) for cultivation in May and June. Burning occurs in late August with planting beginning in September. Weeding occurs from October to November with harvesting taking place during February and March. After planting for one cycle or at most two cycles, the cultivated area is left fallow and allowed to regenerate naturally.

There is the mistaken notion that shifting cultivation is harmful to forest ecology. However, Cramb (1989), Hatch and Tie (1979), Hong (1987) and Rousseau (1994) suggest that the long term continuance of shifting cultivation has depended on the maintenance of soil fertility and minimal disturbance to soils. Cramb (1989) estimates that only around four percent of primary forests are cleared each year for shifting cultivation; the rest of the areas cleared are secondary forests.⁴⁶ Official reports, however, claim a much higher figure (Marajan and Dimin, 1989).⁴⁷ This, however, has been disputed in studies by Chin (1985), Cramb (1987, 1989), Hong (1987), Rousseau (1994), and WWF (1985).

Shifting cultivation is fundamental to native existence (except the nomadic Penan) and remains a central activity in their economic, cultural and religious livelihood (Brosius, 1986; Freeman, 1970; Langub, 1989; Mahdzan, 1990, Sutlive, 1992). Studies discussing the prevalence of shifting cultivation among Sarawakian native groups, and their location are listed in Appendix 3.4. The significance of shifting cultivation is broadly similar across

⁴⁴ Fallow areas are cultivated areas that are left to be naturally regenerated after one or two cycle of crops have been planted in an area. In the past, such areas have been left long enough for secondary forests regrowth to occur.

⁴⁵ ITTO, 1996, op. cit., p. 49.

⁴⁶ This amounts to around 5,000 hectares. See R.A. Cramb, "Shifting Cultivation and Resource Degradation in Sarawak: Perceptions and Policies", *Borneo Research Bulletin* 21, No. 1, (April 1989), p. 39.

⁴⁷ An estimated figure of 60,000 ha per year by E. Marajan and A. Dimin, "The Practice of Shifting Cultivation in Sarawak - A Menace to Forest Management and Conservation", Paper Presented at the Persidangan Perhutanan Malaysia Kesepuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989, p. 4.

native groups although minor variations in the emphases of practices do exist.⁴⁸ Mahdzan (1990) points out that natives have continued in this practice even after joining government agricultural schemes.⁴⁹ The Iban and other native groups practice shifting cultivation not only for subsistence but also for cultural and religious reasons. Shifting cultivation of hill *padi* forms the Iban's cultural core and lifestyle.⁵⁰ According to the Iban, *padi* possesses a spirit soul and therefore *padi* planting is essentially a ritual undertaking.⁵¹

Numerous studies in the 1980s confirm the prevalence of shifting cultivation among the various native groups throughout Sarawak. For example, Kedit (1980)⁵² reports that the very existence of the Iban of Lubok Antu in Sarawak's Second Division hinged on shifting cultivation.⁵³ The Orang Ulu (Kenyah, Kayan, Lun Bawang, Penan, Bisaya, Kelabit and others) are also predominantly shifting cultivators (Seling and Langub, 1989).⁵⁴ The Kenyah,⁵⁵ a major sub-ethnic group of the Orang Ulu, are shifting cultivators (Chin, 1985). However, Sagan points out that the introduction of wet *padi* and cash crops like rubber, coffee, cocoa, and pepper by the Government has brought about a gradual change in

⁴⁸ For both the Kayan and Lahanan, shifting cultivation (also known as swidden) is performed twice: one large swidden for subsistence, and one smaller swidden for religious purposes (Guerreiro, 1988). *Padi* is important not only as a staple but a symbol of wealth and prestige for the Kelabit (Saging and Bulan, 1989). For the Punan Bah, their daily life as well as annual cycle of major social events are largely structured by agricultural activities; just as rites and elements of the ideological system reflect the social significance of *padi* (Nicolaisen, 1983).

⁴⁹ A. Mahdzan, "Obstacles to Raising Agricultural Productivity: The Case of Shifting Cultivators of Sarawak, Malaysia", Conference Paper Presented in the Seventh World Productivity Congress, 19 November 1990, p. 20.

⁵⁰ P.M. Kedit, "An Overview of Iban Traditional Cultural Values and Social Norms, and Their Implications for Contemporary Sarawak", *The Sarawak Museum Journal* XL, No. 61 (New Series) (Special Issue No. 4 Part IV) (December 1989), p. 1.

⁵¹ *ibid.*, p. 6.

⁵² P.M. Kedit, *Modernization Among the Iban of Sarawak*. Kuala Lumpur: Dewan Bahasa dan Pustaka, Kementerian Pelajaran Malaysia, 1980, chap. 4.

⁵³ *ibid.*, p. 83.

⁵⁴ D. Seling and J. Langub, "The Orang Ulu: An Overview", *The Sarawak Museum Journal* XL, (No. 61) (New Series) (Special Issue No. 4 Part III) (December 1989), p. 23.

⁵⁵ S.C. Chin, "Agriculture and Resource Utilization in a Lowland Rainforest Kenyah Community", (Special Monograph No. 4), *The Sarawak Museum Journal* XXXV, No. 56 (New Series) (December 1985), pp. 1-314.

traditional economic activities of the Kenyah communities.⁵⁶ Only the permanently settled and semi-settled Penan practice shifting cultivation (Kavanagh, Rahim, and Hails, 1989).⁵⁷

More recent studies provide mixed reports on the prevalence of shifting cultivation. Taylor, Hortin, Parnwell, and Marsden (1994) discuss the declining importance of shifting cultivation in the case of the Iban in the Bintulu Division. Only six out of the thirteen households in the area were involved in shifting cultivation with more permanent forms of agriculture being adopted in recent years as this region has been subjected to the effects of increasing urbanisation and commercial logging.⁵⁸ Nevertheless, shifting cultivation, active and fallow areas, still covers twenty-seven per cent of 8,000 sq km of forest land, while settled agriculture occupies only one per cent of the land area.⁵⁹ In the same area, Parnwell and Taylor (1996) report in a later period that only about one-third of the households interviewed in their earlier study still continued practising shifting cultivation in the same area.⁶⁰ Parnwell and Taylor, however, warn that this declining significance cannot be generalised across all Iban communities or even be considered as representative of shifting cultivation in the Bintulu area, as logging has been occurring in this specific area for over fifteen years.⁶¹

In this respect, the ITTO (1995; 1996) project to develop a model forest management area substantiates the continued importance of shifting cultivation.⁶² It was reported that

⁵⁶ Wet *padi* cultivation was not practiced until the 1970s but this has been constrained by the lack of suitable flat land and source of water supply for wet *padi* cultivation. The cultivation of wet rice in some if not all instances is similar to that of dry rice in that areas are also left fallow for several years before recultivation. See J.D. Sagan, "The Kenyah of Sarawak", *The Sarawak Museum Journal* XL, (No. 61) (New Series) (Special Issue No. 4 Part III) (December 1989), p. 119.

⁵⁷ Even for the semi-settled Penan, primary forests still remain the main focus of their lives as shifting cultivation of rice only provides them with rice for two to three months of the year. For the remaining part of the year, this group of Penan move back into the forests and live like their nomadic counterparts. See M. Kavanagh, A.A. Rahim, and C.J. Hails, *op. cit.*, p. 38.

⁵⁸ D.M. Taylor, D. Hortin, M.J.G. Parnwell, and T.K. Marsden, "The Degradation of Rainforests in Sarawak, East Malaysia, and its Implications for Future Management Policies", *Geoforum* 25, No. 3 (1994), p. 363.

⁵⁹ *ibid.*, p. 361.

⁶⁰ M.J.G. Parnwell, and D.M. Taylor, "Environmental Degradation, Non-Timber Forest Products and Iban Communities in Sarawak: Impact, Response and Future Prospects" in Parnwell, M.J.G., and Bryant R.L., eds., *Environmental Change in South-East Asia: People, Politics and Sustainable Development*. London and New York: Routledge, 1996, pp. 285-286.

⁶¹ *ibid.*, p. 282.

⁶² International Tropical Timber Organization. *Model Forest Management Area - Phase II*. PD 14/95 Rev. 2(F), ITTO Project Proposal, Japan: International Tropical Timber Organization, September 1995, p. 85; and International Tropical Timber Organization (ITTO), *Ten-Year Development Plan for the Model Forest*

shifting cultivation was predominantly practiced by the Iban in the Mukah-Anap region.⁶³ Nearly all households owned relatively large plots of land averaging 18.8 ha per household.⁶⁴ Burgers, Nolten, Servass, Verhey, and van Grunsven (1991) reported that 84.5 percent of Bidayuh households in Teng Bukap in the Kuching Division practice shifting cultivation.⁶⁵ Burgers (1993) again reports that shifting cultivation is still a continuing major activity for the Bidayuh of the Teng Bukap Subdistrict in the Kuching Division.⁶⁶

Generally, shifting cultivation has remained important in Sarawak in the 1980s and 1990s in spite of modernisation.⁶⁷ Table 1.5 of Chapter One shows that land areas devoted to shifting cultivation (fallow and active areas), have in fact increased from 23.15 percent to 29.64 percent between 1976 and 1991, an upward instead of downward trend. The same table records that cash crop activities covered only 2 per cent of Sarawak's total land area in 1991.⁶⁸ Hence, shifting cultivation cannot be dismissed lightly as an inconsequential activity, especially in the period under study, when conflicts in forest use were prevalent.

3.2.3 Edible and Non-Edible Forest Products: Wildlife, Fruit, Vegetables, Staples, Medicines, Agricultural Implements, and Housing Materials

In the period under study, forests have also provided many edible and non-edible resources necessary for the livelihood of all native groups of Sarawak (Burgers, 1993; Cleary and Eaton, 1992; De Beer and McDermott, 1989; Hong, 1987; ITTO, 1990, 1995, 1996; Parnwell and Taylor, 1996). Together with shifting cultivation, the gathering, hunting, and

Management Area - Sarawak (MFMA), 1996-2006: Forest Land Use and Management Plans Training, Research and Development and Demonstrations. ITTO Project PD 105/90 Rev. 1 (F). Japan and Malaysia: International Tropical Timber Organization and Forest Department, Sarawak, 1996, pp. 48-49.

⁶³ ITTO, 1995, op. cit.

⁶⁴ *ibid.*, p. 89.

⁶⁵ P. Burgers, M. Nolten, M. Servass, W. Verhey, and L. van Grunsven, *Shifting Cultivation in Teng-Bukap Subdistrict Kuching Division, Sarawak: A Socio-Economic Study in 16 Communities*. Department of Geography of Developing Countries, Geographical Institute, University of Utrecht (Netherlands), 1991, p. viii.

⁶⁶ P.P.M. Burgers, "Rainforest and Rural Economy in Sarawak", *The Sarawak Museum Journal* XLIV, No. 65 (New Series) (December 1993), p. 26.

⁶⁷ E. Jabu, "Historical Perspective of the Iban", *The Sarawak Museum Journal* XL, No. 61 (New Series) (Special Issue No. 4 Part IV) (December 1989), p. 30.

fishing activities form an integrated system of resource utilisation within the forest ecosystem.⁶⁹ Historically, forest areas have provided most of the products necessary for native subsistence. This is also true for rural dwellers during the period under study and up to today as many subsistence farmers have little or no cash income.

The link between forests and the availability of edible and non-edible forest products cannot be understated and has been discussed in numerous anthropological studies since the 1980s. Most of these studies are descriptive but they illustrate the diversity of edible and non-edible forest products used by specific native communities for subsistence. Hunting of game has often been a very important activity. The wild boar (bearded pig) is an important source of protein. Fishing also features prominently. In addition, forest fruit and vegetables are also important. In terms of non-edible forest products, timber and rattan from forests are important. A list of studies identifying the types of forest products used by particular native groups is provided in Appendix 3.4. Edible forest products include vegetables and edible fungi, fruit, bamboo shoots, sago, wildlife (wild boar, monkeys, crocodiles, bears, deer, squirrels, birds, snakes, frogs, fish, and prawns). Non-edible forest products include timber, rattan, firewood, medicines, *illipe nut*, *engkabang* (fragrant wood), and poisons for hunting. The importance attached to edible and non-edible forest products is also reported in the ITTO interviews with native groups throughout Sarawak (ITTO, 1990). Timber was frequently mentioned as a raw material for housing, agricultural implements, and boats; rattan for the manufacture of baskets, mats, and agricultural and hunting implements.

For the Kenyah, Chin (1985) reported that the gathering of wild fruit and vegetables⁷⁰ have yielded between 10 to 25 per cent of the food requirements.⁷¹ An average of 57.23 per cent of food sources (gathered/caught/hunted plants, animals, and fish) have been collected from forests.^{72 73} The wild pig or wild boar (*babui*) and fish (*atok*) are the most important

⁶⁸ This table also helps to put into proper perspective the importance of shifting cultivation as compared to native cash cropping activities.

⁶⁹ J.H. De Beer, and M.J. McDermott, *The Economic Value of Non-Timber Forest Products in Southeast Asia: With Emphasis on Indonesia, Malaysia and Thailand*. Amsterdam: WWF, July 1989, p. 46.

⁷⁰ Vegetables include *kulat* (mushrooms and fungi), *paku* (ferns), and *ubot* (the "hearts" of various plants).

⁷¹ Chin, op. cit., p. 115.

⁷² *ibid.*, p. 79.

sources of protein.⁷⁴ For the Penan, forests have provided them with an area to hunt, to obtain and process sago, and to collect rattan (Brosius, 1986).⁷⁵ Many Penan communities depend on sago for 8 to 10 months of the year.⁷⁶ Camphor, *jelutong*, *damar* and bezoar stones are some of the main items that have been collected and traded. *Garu* was also another item collected from forests. However, this has ceased in the 1980s because of over harvesting.

Most forest products are still used directly for native subsistence (housing, agricultural and hunting implements, food) but some are now sold in markets⁷⁷ for cash and used to purchase products not available⁷⁸ or no longer available in forests, because of the pace of modernisation or the intensity of commercial logging activities. Cash income is also used to meet shortfalls in the production of hill *padi*. Forest products that do not have direct value to native communities but are a valuable source of cash income are *engkabang*,⁷⁹ *garu* wood,⁸⁰ and birds' nest (a Chinese delicacy made from the saliva found in the nest of swiftlets).⁸¹

It is easy to understand why logging activities have aroused native animosity. The removal of forestry cover has led to a decrease in the availability of forest products without compensation forthcoming from logging companies or the state. Many studies, have pointed to the impact of logging as a cause of decreases in the stock of edible and non-edible forest products.

⁷³ These items comprise an average of 32.1 per cent of important food items consumed by the Kenyah natives. See *ibid.*, p. 81.

⁷⁴ The proceeds of hunting by a longhouse under study by Chin for five months revealed that the following animals were caught. 32 pigs (The wild boar, or the bearded pig (*Sus barbatus*) is the only wild pig found in the whole of Borneo. The common wild pig (*Sus scrofa*) is not found in Borneo.), 17 piglets, 9 deer, 3 barking deer, 2 mousedeer, 5 monitor lizards, 4 monkeys, 6 or more squirrels, 4 civets, 2 scaly anteaters, 1 hornbill, 1 porcupine, 1 bearcat and 2 sun bears. This example illustrates the diversity of wild life from forests that are of use to this particular group of natives. See *ibid.*, p. 103.

⁷⁵ Brosius, *op. cit.*, p. 174.

⁷⁶ *ibid.*, p. 180.

⁷⁷ Personal observation of such products in Tamu Muhibbah Market in Miri in December 1995 reveals that forests provide a diversity of fruits and vegetables too numerous to count or identify. This has been substantiated by WWF (1994).

⁷⁸ For example, outboard motors and zinc roofs.

⁷⁹ Illipe nuts are derived from this tree for making chocolates.

⁸⁰ fragrant wood used for perfumes.

⁸¹ De Beer and McDermott, *op. cit.*, p. 65.

Numerous grievances were expressed by natives to the ITTO (1990) mission on the decreasing availability of a wide range of products which had been caused by logging. Community leaders of the Lundu District⁸² in the Kuching Division reported that logging resulted in loss of game, fish stocks,⁸³ and rattan.⁸⁴ Consequently, they have had to purchase vegetables and meat from markets. In the Kapit District (Kapit Division), the loss of timber, rattan, game, *engkabang*, fruit trees, and fish was reported by community leaders.⁸⁵ In Limbang, also in the Kapit Division, similar losses (fish, game, and rattan) were again reported by the Penan and Kelabit.⁸⁶ The Iban natives living up river in Limbang also suffered from a shortage of wood for making boats and coffins.⁸⁷ In the same area, the Penan reported that *ipoh* trees, which are crucial for providing poison for their hunting darts have been destroyed.⁸⁸ The Kelabit community leader in Limbang reported that there was a shortage of timber for the manufacture of boats.⁸⁹ In the Miri Division, the Penan of Bario reported that logging had destroyed game, fish, and sago in their area.⁹⁰ In addition, the continued importance of forests in supplying wood (blowpipes), poison (darts), traditional medicines, *garu*, rattan, and gums despite changing times was stressed.⁹¹

Parnwell and Taylor (1996) also report on the damage to forests and traditional forest products from logging. Degradation of the rainforest ecosystem due to logging, large scale agricultural schemes, and human settlements have resulted in rapidly declining quality and quantity of forest products,⁹² affecting hunting, fishing, and collecting activities.⁹³ For example, five out of thirteen longhouses in their study indicated that hunting and collecting activities have ceased because of logging. Water pollution and sedimentation caused by logging have curtailed fishing activities also. This reduction in forest products

⁸² Consisting of Bidayuh: 36.3 percent, Malays: 29.1 percent, and Iban: 17.5 percent.

⁸³ The construction of logging roads caused pollution and erosion, and the silt brought down by the rainwater had affected aquatic life.

⁸⁴ ITTO, 1990, op. cit., pp. 136-138.

⁸⁵ *ibid.*, pp. 147-152.

⁸⁶ *ibid.*, pp. 165 and 169-170.

⁸⁷ *ibid.*, p. 169.

⁸⁸ *ibid.*, p. 170.

⁸⁹ *ibid.*

⁹⁰ *ibid.*, p. 174.

⁹¹ *ibid.*

⁹² Parnwell and Taylor, 1996, op. cit., p. 269.

⁹³ *ibid.*, p. 290.

has encouraged out-migration, to derive money income for purchasing substitute foods in the market.⁹⁴ However, Parnwell and Taylor point out that caution should be exercised in overgeneralising this observation across Sarawak as the Bintulu Division is relatively urbanised.⁹⁵

For the Iban in the Mukah-Anap region in the Bintulu Division (ITTO, 1995, 1996), hunting and fishing activities figure highly in some but not all areas. Hunting, fishing, and the collection of jungle fruit and vegetables is carried out weekly.⁹⁶ The decline in fishing activities in recent years in this area has been attributed to siltation and pollution of rivers caused by the removal of forestry cover.⁹⁷ Another study discussing the significance of modernisation and logging on the collection of edible and non-edible forest products is Burgers (1993). Cash incomes derived from the sale of forest products (rattan and hardwood),⁹⁸ average around RM 253 per household per year in 1990 currency.⁹⁹ Trends in the collection of forest products have been changing with a marked decrease in the availability of bamboo, ferns, game meat, fish and rattan.¹⁰⁰ Prohibitions placed on shifting cultivation in primary forests, increases in population, and commercial logging are factors that had brought about this reduction.

In terms of the link between logging and the availability of forest products, Caldecott (1986) reported that the productivity of hunting fell from 2.2 kg/man-hour to 1.1 kg/man-hour.¹⁰¹ Additionally, this is made worse by the reduction in fish stocks caused by erosion and water pollution. Caldecott also reported that the decline in wildlife is attributed to

⁹⁴ *ibid.*, pp. 294-295.

⁹⁵ *ibid.*, p. 282.

⁹⁶ ITTO, 1996, *op. cit.*, p. 49.

⁹⁷ *ibid.*, p. 87.

⁹⁸ *ibid.*

⁹⁹ *ibid.*, p. 32.

¹⁰⁰ Bamboo, ferns, palm products, fungi, fruits, honey, game meat, fish, insects, firewood, and rattan are the forest products referred in Burgers' study; *ibid.*, p. 36.

¹⁰¹ J. Caldecott, *Hunting and Wildlife Management in Sarawak: Final Report of a Conservation Management Study for Hunted Wildlife in Sarawak*. Kuala Lumpur: World Wildlife Fund Malaysia, May 1986, pp. 38-39. In terms of meat consumption, there has been a substantial reduction from 3,806 kg/10 families/year pre logging to 1,240 kg/10 families/year in the first decade after logging. In the second decade this figure fell to 534 kg/10 families/year and in the third decade, this figure fell to 155 kg/10 families/year. See *ibid.*, p. 97. The consumption of meat fell accordingly from 149 g per person/per day in the pre-logging period to 49 g per person/per day in the first decade to 21 g per person/per day in the second decade to 6 g per person/per decade in the third decade. See *ibid.*, p. 96.

changes in the availability of food, shelter, and water supply.¹⁰² Using meat consumption figures from boarding schools in the interior, he estimated that over fifty-six percent of protein consumption (meat and fish) is derived from the wild.¹⁰³ The bearded pig (wild boar) constituted over 75 per cent of all hunted animals.¹⁰⁴ In the past, overhunting has had its impact on wildlife populations but generally wildlife has been able to recover because natural forested habitats have provided the food these animals required for survival and reproduction. However, the removal of forestry cover has negated this cushioning impact¹⁰⁵

3.2.4 Human Abode and Native Graveyards

Native communities dwell in permanent longhouses, and temporary houses or huts (*dampa*) constructed in forested areas during the planting season. Longhouses tend to be permanent fixtures in forests with occupation rights belonging to individual households within the unit (Freeman, 1970, Ekran, 1995, Hong, 1987, and Morisson, 1995). Most longhouses are also situated close to banks of rivers or streams.¹⁰⁶ During periods of farming, temporary huts are built close to cultivation areas to allow natives to monitor and protect growing crops from pests and animals. Although temporary, these huts are in most instances like the longhouse except they are built on a smaller scale.

Longhouses are established on the basis of kinship, the need for food sharing during times of scarcity, and for defence, although in present days defence is no longer considered as an important criterion. The location of longhouses has been influenced by government directives since the 1900s (Freeman, 1970).

Besides building their houses in forests, the culture and religion of the natives are also entwined with forests, especially in the aspect of native burial grounds. Natives in Sarawak pay great reverence to the deceased and after life (Hong, 1987). Burial sites are recognised in official circles and there is legislative protection for such areas. Such areas are treated as

¹⁰² *ibid.*, p. 94.

¹⁰³ *ibid.*, p. 63.

¹⁰⁴ *ibid.*, pp. 38-39.

¹⁰⁵ *ibid.*, p. 95.

¹⁰⁶ Freeman, *op. cit.*, p. 63.

a legal entity, and recognised in legislation as an area to be protected: part of the Native Customary Lands in the Land Code (Sections 2 and 5 of Sarawak Cap. 81).

Dayak religion includes ritual and worship related to land, houses and the dead.¹⁰⁷ Great respect is accorded to burial sites, and attention is devoted to maintaining "equilibrium" or spiritual harmony in these areas governed by *adat* (native customary law) which details all aspects of native life and relationships including death. *Adat* is perhaps well described by Jensen (1974) in his study of the Iban, which is generally applicable to all Dayak groups in Sarawak:

The *adat* ... is designed to ensure a mutually satisfactory relation between men and the other inhabitants of the universe. Although in his instinctive response to life around him the Iban may see himself as standing at the centre of universe, he knows that he does not control it. He recognizes that he is part of a whole which encompasses other people and other levels of existence. He believes the universe to be inhabited by various groups, human, spirit, animal, and vegetable, which have some interests in common but also have diverging and conflicting interests. *Adat* exists to ensure harmony in this universe and to promote the well-being of all its inhabitants, among them the Iban.¹⁰⁸

Natives believe that an offence against *adat* (say, disturbing a gravesite) affects equilibrium and disturbs the universal order which can result in minor sicknesses, epidemics or crop disorders.¹⁰⁹ Compensation must be offered to the offended spirit or party to restore spiritual harmony or order. The Iban also believe in the immortality of the soul (Freeman, 1970). The forested area in which the site has been chosen is left in a primeval state, to which all members of the said household have equal access. Sites are not entered upon except for burials and rituals. Articles ranging from clothing, *padi* seed, ornaments, and cooking utensils are provided for every dead person, and some are buried with the corpse (clothing, seeds, ornaments) while others are left lying on the surface of the grave (gongs, utensils).¹¹⁰ Hence such areas are indicated by the burial property (jars,

¹⁰⁷ A.J.N. Richards, *Sarawak: Land Law and Adat*. Kuching: Government Printers, 1961, p. 21.

¹⁰⁸ E. Jensen, *The Iban and Their Religion*. London: Oxford University Press, 1974, p. 112.

¹⁰⁹ *ibid.*, p. 113.

¹¹⁰ Freeman, *op. cit.*, pp. 35-36.

gongs, etc.) in the area.¹¹¹ It is this belief in immortality that leads to the deep respect accorded by the Iban and other native groups for burial sites in forests. Other anthropological surveys suggest that gravesites are located in a common cemetery (Hong, 1987; Saging and Bulan, 1989). Mass migration to another area would mean that a community may have more than one burial site.

The great significance attached by natives to burial sites in forests is demonstrated by the many instances where disturbances to these sites have met with severe reaction and complaints from affected groups. For example, Hong (1987) points to an incident in Penyuan River in Ulu Belaga where the graveyards of the Kenyah Lepo' Tau, Kenyah Badang and Kenyah Sambop have been desecrated by logging. Compensation was demanded by the Kenyah to appease the spirits that were disturbed as the Kenyah believe that disharmony, harm, or bad luck will befall present and future generations when graveyards are disturbed.¹¹² There are also other incidents of native complaints against desecration of graveyards pointing again to the significance attached to such areas: in the Upper Baram, the natives of Long Layun in the Apoh River reported that their graves were desecrated by logging companies.¹¹³ In the ITTO (1990) interviews with native groups, a Penan from Bario reported that logging activities have destroyed many of their gravesites.¹¹⁴ This was again pointed out by another Penan in the Limbang District.¹¹⁵ The Penan in the Magoh and Sepayang areas resorted to blockading, in part due to the destruction of their ancestral graveyards caused by logging companies.¹¹⁶ Such complaints emphasise the importance attached by natives to the dead, to *adat*, and to forests in performing this function.¹¹⁷

¹¹¹ *ibid.*, p. 106.

¹¹² Hong, *op. cit.*, p. 107.

¹¹³ *ibid.*, p. 90.

¹¹⁴ ITTO, 1990, *op. cit.*, p. 174.

¹¹⁵ *ibid.*, p. 166.

¹¹⁶ JPN (Jabatan Pembangunan Negri) (1987) cited in Kavanagh, Rahim, and Hails (1989), *op. cit.*, pp. 39-40.

¹¹⁷ See also, *The Battle for Sarawak's Forests (Second Edition)*. Malaysia: World Rainforest Movement and Sahabat Alam Malaysia, 1989, p. 208.

3.2.5 Ecological Systems: Plant and Animal Species

Sarawak on the island of Borneo lies in the heart of the Sundaland which has the greatest range of biodiversity in Asia in terms of both plant and animal species, with most being endemic (unique) to the region. WWF (1985) points out that Sarawak has one of the largest reservoirs of natural genetic diversity. Chai, Lee, and Ismawi (1988)¹¹⁸ of the Sarawak Forest Department report that around 285 species of indigenous and wild plants have medicinal values for the various native groups in Sarawak.

The conservation of biodiversity in terms of its pharmaceutical values in Sarawak has also been pointed out by Lee (1995), of the Sarawak Forest Department, who discusses the discovery of *Calophyllum* or *Bintangor* tree proven to be a useful inhibitor against HIV. Lee points out that the "incidence of 'strike', that is the percentage of success of an active compound being found from natural products for the development of a drug is extremely low. ... The implication of this is that the biological diversity of our forest areas need to be maintained or if possible enhanced to improve the chance of discovery of drugs and other pharmaceutical products from our forests."¹¹⁹ Pharmaceutical organisations are beginning to have an interest in the medicinal potential of Sarawak's biologically diverse species of forests. This is evidenced by the signing of an agreement between the National Cancer Institute in America and the Sarawak Forest Department on rights to undertake research and marketing of AIDS drugs manufactured from Sarawakian forest materials.

Conservationists in Malaysia and overseas are concerned with the preservation of biodiversity in Sarawak, and have emphasised the importance of conserving biodiversity in region. In this respect, most of these concerns are encapsulated in one organisation which has been active in Sarawak since the 1970s, the Worldwide Fund For Nature, Malaysia (WWFM). The WWFM embodies the concerns of conservationists and that of the scientific community and nature lovers, from Malaysia and overseas. The WWF branch in Malaysia is governed by an executive body consisting of local and international scientists, biologists, academics, education officers, lawyers, administrators, marketing

¹¹⁸ P.P.K. Chai, B.M.H. Lee and Hj. O. Ismawi, *Native Medicinal Plants of Sarawak*. A Sarawak Forest Department Report (No. FB 1), Forest Botany Unit, Forest Department, Kuching, Sarawak, 1989.

and communication officers, and also business and industry professionals.¹²⁰ WWF Malaysia is part of a network of thirty organisations in countries around the world, with its head organisation in Gland, Switzerland. Overall, WWF is one of the largest conservation groups with an operating income of US\$ 323 million,¹²¹ and with projects in more than 70 countries.¹²²

The popular support¹²³ that WWFM has received from ordinary citizens in Malaysia and overseas, reflects an agglomeration of support from individuals who are concerned for conservation. Financial and research support is also obtained from developed countries through the WWF International network.¹²⁴ In 1997, forty six percent of funds came from personal donations, three percent from trusts and foundations, and seven percent from legacies and bequests (WWF, Annual Report 1997).¹²⁵

WWF has been the main driving force behind conservation efforts in Sarawak. This is evidenced by the efforts taken by WWF in terms of its projects on plant and animal conservation in Sarawak involving scientific and management approaches, and of stressing the link played by forested areas in conservation. Other examples of WWF's efforts include its liaison with and provision of information to ITTO on Sarawakian forest management practices, collaboration with the Sarawak Forest Department in terms of research and conservation efforts, liaison with the European Parliament in terms of dissemination of information on Sarawakian forestry practices, and raising of public awareness of the importance of conservation in Malaysia and Sarawak.¹²⁶

¹¹⁹ Lee, Hua Seng, "Biodiversity Conservation in Sarawak - Perspective from Drug Discovery and Silvicultural Management", Proceedings of the 12th Malaysian Forestry Conference, Miri, Sarawak, 20-26 November 1995, p. 5.

¹²⁰ "What is WWF Malaysia?" in <http://www.geocities.com/RainForest/2701/2.html>, no date. Retrieved from the internet on 23 January 1999.

¹²¹ WWF, Annual Report 1997 in <http://www.panda.org/wwf/Report97/annrep-eng/page13.htm>, no date. Retrieved from the internet on 9 January 1999.

¹²² "UK: Controversy Forces Rethink on World Wide Fund's Investment Policy", Guardian, 5 September 1990, p. 3.

¹²³ Forty six percent of donations are from individuals.

¹²⁴ Kavanagh, Rahim, and Hails, op. cit., p. 55.

¹²⁵ WWF, Annual Report 1997 in <http://www.panda.org/wwf/Report97/annrep-eng/page10.htm>, no date. Retrieved from the internet on 9 January 1999.

¹²⁶ S.T. Mok, A.A. Jalil, and D. Jiwon, *A WWF Strategy for Tropical Forest in Sarawak*. Report Produced Under WWF Project No. 3262 Follow-Up. Malaysia: WWF, November 1991, pp. 3-9.

In terms of conservation concerns, the chief aim of WWF Malaysia was to "identify specific, realistic goals for conservation in Sarawak" and "to support a strong and long-term presence in Sarawak through project funding."¹²⁷ This has been carried out through its various research projects, seminars, and policy papers on conservation in Sarawak.¹²⁸ Hence, nowhere is there a better source of information to identify WWFM concerns than is available from a host project studies and papers on issues related to Sarawakian conservation.¹²⁹ For example, Kavanagh (1985) of WWFM stressed the importance of forested areas in conserving wildlife (plant and animal species), that areas allocated (known as Totally Protected Areas or TPAs in Sarawak) should be carefully planned¹³⁰ and be as large as possible because of an interconnected ecological web of plant and animal species.¹³¹ Plant and animal species often exist in complex symbiotic relationships.¹³²

It should be noted that the National Parks and Wildlife Office in the Sarawak Forest Department also plays a role in conservation by providing logistical and research facilities, in collaboration with the research input provided by WWF (Morshidi and Gumal, 1995). Nevertheless, the preservation of biodiversity by the Sarawak Forest Department has been given a lower priority compared to timber harvesting. This reason will become clear in Chapter Six. The importance of conservation has also been supported by ITTO (1990) which pointed out that the effectiveness of protected habitats depends on the completeness of coverage.¹³³ However ITTO is concerned for biodiversity only to the extent that timber harvesting does not do long term irreversible damage to the ecology, that the forest eco-

¹²⁷ Kavanagh, Rahim, and Hails, op. cit., p. vi.

¹²⁸ It is important to note that WWFM documents, although scientific- and management-oriented, are not "independent" or refereed journal articles.

¹²⁹ The focus here will be on information sources related to conservation in Sarawak. There are other WWF papers that cover biodiversity conservation in Malaysia as a whole. See, for example, Louis (1994), Oh (1995), Rahman and Kavanagh (1989), and Yzacob (1994).

¹³⁰ M. Kavanagh, "Planning Considerations for a System of National Parks and Wildlife Sanctuaries in Sarawak", *Sarawak Gazette* (April 1985), p. 15.

¹³¹ Totally Protected Animals cannot be hunted, killed, captured, and sold; while Totally Protected Plants cannot be cultivated, cut, trimmed, removed, burned, poisoned, or injured except for scientific and educational purposes through a licence issued by the Director of Forests. Protected Animals and Plants can be used for any purpose through a licence issued by the Director of Forests. Natives are not required to have a licence to utilise or sell Protected Animals and Plants in native area land, native customary land, and interior area land.

¹³² Forest habitats should include mangrove forests, peat swamp forests, *kerangas* forests, lowland mixed dipterocarp forests, forests over limestone, lower montane forests, and upper montane forests.

¹³³ ITTO, 1990, op. cit., p. 48.

system is left almost intact and capable of recovery (ITTO, 1990; 1994c), whereas WWF is directly concerned with the role of forests in conserving plant and animal diversity.

Assessments of Sarawak's conservation progress for representative habitats were carried out by WWF throughout the 1980s and 1990s.¹³⁴ WWF approached the Sarawak government in March 1984 to draw up a conservation strategy that would provide guidelines for the use of natural resources.¹³⁵ In this document, WWF (1985) pointed to the wide range of biodiversity present in Sarawak's forests that is "largely unstudied and scarcely known to science."¹³⁶ WWF highlighted that there was this "less tangible, but at least equally important, objective concerning the long-term incorporation of ecological principles into development planning."¹³⁷ The important ecological web sustained by forest diversity (including mangroves), identifying the importance on non-timber forest products, and recognising the importance of forests in preventing soil erosion, housing and protecting wildlife, and providing for human subsistence were recognised as interconnected to the preservation of biodiversity.¹³⁸

WWF identified the roles played by the various forest types in sustaining wild life and plant species; at times, including the economic implications of these roles. The significance of mangrove forests was noted, with WWF recommending the development of a State Mangrove Plan to protect such forests in the Sarawak River delta, the Rejang delta, the Limbang estuary, and the Trusan and Lawas delta.¹³⁹ WWF noted that mangroves housed commercial products like poles, firewood, charcoal, and chipwood. It pointed out that mangroves also perform other roles like stabilising soil movements and

¹³⁴ There are two versions of this assessment. The first was undertaken in Kavanagh (1985) which included general and forestry conservation in Sarawak. The Kavanagh, Rahim, and Hails, (1989) version discusses conservation in relation to forests only but this information is more current. Based on the latter, in terms of different forest habitats, mangroves are still deemed to be poorly protected, area of protected peat-swamp forests are not sizeable enough, forests over limestone in the south are not protected, and montane areas are under-represented. See Kavanagh, Rahim, Hails (1989), op. cit., pp. 14-15.

¹³⁵ L. Chan and Langub, J., "Case Study: Conservation Strategy: Sarawak", *Sarawak Gazette* (July 1986), p. 4. (This report is a summary of WWF, *Conservation Strategy Malaysia: Proposals for a Conservation Strategy for Sarawak (Confidential)*. A Report Submitted to the Government of Sarawak by the World Wildlife Fund Malaysia by L. Chan, M. Kavanagh, Earl of Cranbrook, J. Langub, and D.R. Wells in Collaboration with the State Planning Unit of Sarawak. Malaysia: WWF, December 1985).

¹³⁶ WWF, *Conservation Strategy Malaysia* ..., op. cit., p. 69.

¹³⁷ Chan, and Langub, op. cit., p. 4.

¹³⁸ *ibid.*, pp. 9-14.

checking soil erosion, providing nourishment to aquatic organisms in mangrove and adjacent aquatic systems,¹⁴⁰ and sustaining wildlife populations.¹⁴¹ Species of prawns were reported to be dependent on mangroves.¹⁴² The study by Bennett (1989)¹⁴³ of WWF also points out that the Proboscis monkey, which is endemic to Borneo is largely restricted to, and dependent on, the mangrove, riverine, and peat swamp forests of the coastal lowlands.

The WWF conservation study also recognised that the richest biodiversity flora and fauna exist in the lowland mixed dipterocarp forests.¹⁴⁴ The team stressed that it was important that adequate amounts of lowland mixed dipterocarp forest areas be preserved as Totally Protected Areas (TPAs). Wild pigs, which are a source of protein for the natives, depend on wild fruit and seeds in these oak- and dipterocarp-rich forests for their existence.¹⁴⁵ The preservation of representative tracts was also emphasised: *empran* forests (a distinctive alluvial forest that is found on the fertile and well watered soils of raised levees along the lower reaches of rivers; *empran* is very species rich and of great importance for *belian* and *engkabang* trees); *kerangas* forests (heath forests sited on extremely poor soil); beach forests; limestone forests; and montane forests. Montane forests also protect sloping water catchments and the production of non-timber forest products; and also serve as rich gene pools.¹⁴⁶

Kavanagh, Rahim, and Hails (1989) of WWF echo the conservation concerns expressed in WWF (1985), but with a focus on forest harvesting practices and its impact on conservation, the environment, and the rural population. The study expresses the concerns of WWF Malaysia about the security of tenure for concessionaires, standards set for logging practices (allowable cuts, cutting cycles, tree marking, harvesting techniques, and

¹³⁹ WWF pointed out that presently only a small proportion of mangroves is protected at the Bako NP and the Samunsam WS. See WWF, *Conservation Strategy Malaysia...*, op. cit., p. 52.

¹⁴⁰ *ibid.*, pp. 51-52.

¹⁴¹ The proboscis monkey, the silvered langur, the golden-backed three-toed woodpecker, the mangrove pitta, the mangrove blue flycatcher, and the great tit are some examples. See *ibid.*, p. 52.

¹⁴² Hence from a conservation viewpoint, any plans to alter mangrove resources should take into account the long term values of other options: for example, the export of prawns, many of whom are dependent on mangroves, has exceeded the value of woodchips from mangroves.

¹⁴³ E.L. Bennett, *Wetland Forest Conservation in Sarawak*. A Report Produced Under WWF Project No. 3518 (MYS92/86), Malaysia: World Wildlife Fund, June 1989.

¹⁴⁴ *ibid.*, p. 86.

¹⁴⁵ *ibid.*, p. 74.

¹⁴⁶ *ibid.*

environmental standards), understaffing in the Sarawak Forest Department which prevents effective monitoring of forest practices, and protection of the ecology and the environment.¹⁴⁷

In recent years, WWF has expressed concern that measures be taken for the adoption of a Malaysian National Policy of Biological Diversity and an implementation of an action plan.¹⁴⁸ The approach taken must be based on preserving ecosystems, "... the focus of research, management, policy planning and analysis should be on ecosystems and habitats. Such a system would document the nature and extent of the different forests, freshwater, coastal and marine ecosystems in the country, as well as identify the areas for which action is needed in terms of biodiversity conservation and sustainable use of ecosystems."¹⁴⁹ In addition, WWF has also advocated that intellectual property rights be developed for biodiversity prospecting, whereby any benefits derived for human use particularly in the pharmaceutical industry, should be regulated and controlled by countries in which such resources are found.¹⁵⁰

3.2.6 Regulation of Water Flows and Soil Erosion

Undisturbed forests perform important watershed functions as water draining from these areas into rivers is relatively free of sediment. This is because forest cover prevents soil erosion and sedimentation which means that waters flowing from these surfaces into rivers remain relatively pristine. The role of forests in regulating water runoff and water quality is therefore an important function performed by undisturbed forests.

The water catchment function of forests is recognised by the Sarawak Forest Department (*Annual Report of the Forest Department Sarawak, various years*) as indicated in its Forest Policy which was promulgated in 1954, and also in discussions of the watershed functions by foresters from time to time (Morshidi, 1976). The importance of the watershed function is recognised by the prohibition of logging in hill forests with slopes

¹⁴⁷ Kavanagh, Rahim, and Hails, op. cit., pp. 45-50.

¹⁴⁸ Cecilia Oh, *Agenda 21 in Malaysia*. WWF Malaysia Discussion Paper (Project MY 0057), Malaysia: World Wildlife Fund, April 1995, p. 22.

¹⁴⁹ *ibid.*, Sustaining the use of ecosystems for the present and longer term benefit of all life on earth.

¹⁵⁰ *ibid.*, pp. 22-23.

exceeding 35 degrees¹⁵¹ to minimise soil erosion. The construction of dams in Sarawak for the generation of electricity depends on forests performing the water catchment function.

There are several groups interested in this function. Section 3.2.3 addressed the importance of this function to native communities in discussing the impact of logging on water pollution and soil erosion and thus on native livelihoods. WWF and conservationists are concerned with the effects of unregulated water flows and soil erosion (caused by timber harvesting) on plant and animal diversity. Professional foresters and the ITTO are concerned with the unsustainability of present timber practices, in that overcutting with the attendant environmental and ecological damage will affect future timber supplies, and also impose undue ecological and environmental costs. Politicians are concerned with the water regulation function of forested areas because of its potential in generating electricity when dams are constructed, although timber brings in more immediate economic benefits. SAM and other action based NGOs are concerned for this function to the extent of which logging has affected both native livelihood and the environment.

Various studies illustrate the significance of this function to the various interest groups. For example, ITTO (1990) was concerned with over-cutting in hill forests which negated the catchment function of forests, and which also resulted in widespread soil erosion in areas where logging was taking place.¹⁵² Gross siltation and contamination of fresh waters was observed in logging areas: damage to upper stream courses and turbid waters were immediately evident.¹⁵³ ITTO reported that this lasting damage was likely to be worse in the future as the bed-load from erosion moved downstream with sandbanks interfering with river navigation and river mouths and ports become silted.¹⁵⁴ Sustainable yields of timber in forests can only be maintained if measures are taken to ensure continuity of timber harvests over time.¹⁵⁵ Such measures must also include reducing present output, prohibiting extraction in areas of over thirty degrees slope, adequately protecting existing stands of forests, and building better roads, drainage, and culverts.¹⁵⁶

¹⁵¹ Forestry in Sarawak Malaysia, op. cit., p. 25.

¹⁵² ITTO, 1990, op. cit., p. 41.

¹⁵³ *ibid.*, p. 43.

¹⁵⁴ *ibid.*.

¹⁵⁵ *ibid.*, p. 61.

¹⁵⁶ *ibid.*, p. 45.

The concerns of native groups are expressed in ITTO (1990) where the impact of gross siltation and contamination on native communities throughout Sarawak is reported. Most native groups shared a common concern on the impact of logging and the reduction in the availability of clean drinking water, reduction in fish supplies because of river contamination and pollution, and of difficulties in navigation because of an accumulation of silt and mud in river banks.¹⁵⁷ The localities and native groups affected are detailed in Appendix 3.4.

The concerns of SAM are documented in SAM (1990). SAM noted that Sarawak's logging activities caused damage to both the forest cover (thus affecting water flows) and to soils. The construction of logging roads has destroyed trees and caused soil erosion, bulldozers have killed trees/plants when searching for the felled tree, felling of trees has destroyed other trees, and more trees were damaged when logs were pulled out.¹⁵⁸ SAM also pointed to the impact of these effects on native subsistence living.¹⁵⁹ Hong (1987),¹⁶⁰ of the *Institut Masyarakat* (a sister organisation of SAM), reported that large scale logging was already causing floods, siltation of rivers, turbidity of upstream river water, and reduction in the aquatic and wildlife population which in turn has affected native livelihood throughout Sarawak in terms of subsistence needs (fish), navigability of rivers, and water for drinking and washing.¹⁶¹ Also, logging methods have inflicted extensive damage to the existing stands of forest even when the harvest was selective and light.¹⁶² Road building, in addition, had also caused soil erosion.

WWF (1985) recognised the importance of forestry cover in regulating water flows and reducing erosion.¹⁶³ WWF noted that the interceptive role of the forest canopy is removed when logging occurs, and rain passes immediately to run-off which may result in flash floods. Under all logging regimes, and not particular to Sarawak alone, the ground surface

¹⁵⁷ *ibid.*, Appendix II.

¹⁵⁸ SAM, 1990, *op. cit.*, p. 15.

¹⁵⁹ *ibid.*, p. 10.

¹⁶⁰ Hong, *op. cit.*, pp. 117-121, and pp. 157-165.

¹⁶¹ *ibid.*, pp. 153-154; and Chapter 2 for a defence of shifting cultivation as an activity that is ecologically sound.

¹⁶² *ibid.*, p. 158.

¹⁶³ WWF, *op. cit.*, p. 77.

of logged areas is inevitably damaged by the movement of heavy extraction machinery. Existing run-off patterns on slopes and hillsides are disrupted by earthworks or by unextracted timber, waste wood, and so on. This disturbance increases the silt-load in rivers and streams causing turbidity. Reduced oxygen levels in streams and rivers will also affect both plant and animal life which in turn affects rural communities who are dependent on rivers and streams to supply clean sources of water and catches of fish and shell fish which are a traditional significant source of dietary protein for native communities throughout Sarawak.¹⁶⁴ This has been observed in several parts of Sarawak: at Belaga, and in the Tutoh and Tinjar areas in the Fourth Division where the river water is almost always permanently turbid.¹⁶⁵

Logging of hill forests necessitates the clearing of about 12 per cent of the total area for roads, landings, and trails.¹⁶⁶ Furthermore, the extraction process leaves an average of 34 per cent of forested areas open. Thus hill forest logging in Sarawak removes about 46 per cent of the natural cover.¹⁶⁷ Serious damage is done to the top soil surface and this was attributed to extraction which involves skid trails, tracking by heavy plant, stockpiles, loading paths, and lorry roads.

Forests or forested areas are also valued in Sarawak for the potential that they provide for regulating water flows and hence the construction of hydroelectric dams. The steep, relatively uninhabited forest uplands coupled with Sarawak's river and tributary systems have appeared as very promising areas for the construction of hydro-electric dams thus supplying the industrialisation and revenue needs of the state (Colchester, 1989; Hong, 1987). The Sarawak Electricity Supply Corporation (SESCO) in 1980-81 explored this possibility and 51 sites were suggested as potential hydropower projects.¹⁶⁸ Work began on the Batang Ai Dam in the Sri Aman Division in December 1980 and the dam was officially opened in 1985. Water catchment function is provided by the Batang Ai National

¹⁶⁴ *ibid.*, p. 78.

¹⁶⁵ *ibid.*

¹⁶⁶ *ibid.*, p. 87.

¹⁶⁷ *ibid.*

¹⁶⁸ Colchester, M., *Pirates, Squatters and Poachers: The Political Ecology of Dispossession of the Native Peoples of Sarawak*. Malaysia: Survival International, INSAN, 1989, p. 58.

Park covering 24,040 ha in the headwaters of the Batang Ai river upstream of the dam (Meredith, 1995).

The potential of forested areas in providing for water catchment is best exemplified by the proposed construction of the Bakun Hydroelectric Project. As Ekran states:

The essential objective of preparing the reservoir is common to all hydroelectric generating projects, that is to prepare an area of sufficient size to contain a pre-determined volume of water of acceptable quality. The water is required to sustain a continuous supply (i) to the power plant for the production of a pre-determined minimum quantity of power, (ii) to other reservoir and shoreline users, and (iii) to the downstream users.¹⁶⁹

In the first place, the site of the Bakun Dam was selected because the catchment upstream covers an area of 1.5 million ha of forested area with many river systems and tributaries.¹⁷⁰ The Environmental Impact Assessment estimated that soil losses of 200 to 500 tonnes per ha per year would occur as a result of timber extraction. In the construction of logging roads, a value of 500 to 1,000 tonnes per ha per year was estimated. For undisturbed/shifting cultivation/and secondary forests, the figure of one tonne per ha per year was cited. This recognises the importance of forest cover in preventing sedimentation and soil erosion.¹⁷¹

3.2.7 Recreation and Tourism

The potential of forests in providing recreation and tourism was recognised by the Sarawak Forest Department through the establishment of National Parks, the first of which was the Bako National Park which was established in 1957 (Morshidi, 1976). As Morshidi of the Forest Department states:

The importance of the tourist industry in Sarawak cannot be ignored. ... Coupled with this is the scenic beauty of its countryside which certainly enhance the tourist potential of the State. In this context the developments of national parks with aesthetic and scientific features are essential to

¹⁶⁹ *Privatisation of the Bakun Hydroelectric Project: Detailed Environmental Impact Assessment for Reservoir Preparation*. Sarawak, Malaysia: Ekran Berhad, February 1995, p. 2-8.

¹⁷⁰ *ibid.*, p. 2-3.

¹⁷¹ *ibid.*, pp. 3-5 to 3-6.

accentuate the contribution towards the growth of tourist industry in the State.¹⁷²

That the recreation and tourism function of forests is recognised is further evidenced in the mid-1970s in the *Annual Report of the Forest Department Sarawak, 1975*, whereby one of the objectives of the National Parks and Wildlife Section set up in the Sarawak Forest Department in 1975 was to "reserve natural areas for outdoor recreation, education and tourism."¹⁷³ In addition, the National Parks and Wildlife Section in the Sarawak Forest Department has over the years been developing recreation and accommodation facilities in the various National Parks in recognition of the function of forests in performing the role of recreation and tourism (Bujang and Sandi, 1992). Ecotourism has been viewed by the Sarawak Forest Department as a "resource-based endeavour that promises both economic potentials as well as the recognition of environmental or resource conservation."¹⁷⁴ The value of ecotourism has certainly been appreciated by the Forest Department. As Bujang and Sandi (1992) state:

There has been a noticeable linkages between forest conservation and ecotourism in the State especially so in the establishment of national parks. The increased inflow of tourists has been parallel to the increase in the number of constituted national parks. Reciprocally, the encouraging upward trend of tourist inflow to the state has also brought greater appreciation of the economic potentials of nature conservation in general and forest conservation in particular. Currently, there is an upheaval of interest both on the part of the government and private entrepreneurs to invest in ecotourism related development.¹⁷⁵

Bujang and Sandi also state that one of the Sarawak Forest Department's strategies on forests has been towards "enhancing the tourism potentials of national parks through the formation of management plans and development of infrastructure and recreation facilities."¹⁷⁶ Between 1987 to 1991, the Forest Department recorded a total of 518,000

¹⁷² A.H.K. Morshidi, "Social and Economic Implications in the Development of National Parks in the State of Sarawak", Proceedings of the Sixth Malaysian Forestry Conference (Vol. 2), Kuching, Sarawak, 11-17 October 1976, pp. 40-41.

¹⁷³ *Annual Report of the Forest Department Sarawak, 1975*, p. 16.

¹⁷⁴ Bujang, Abdul Wahab Bin, and Simon Sandi, "Forest Conservation and Eco-Tourism in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 217.

¹⁷⁵ A.W.B. Bujang, and S. Sandi, "Forest Conservation and Eco-Tourism in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 220.

¹⁷⁶ *ibid.*, p. 220.

local visitors and 128,270 foreign visitors to the various National Parks;¹⁷⁷ figures of which are provided in Bujang and Sandi. Entrance and administrative fees collected from visitors of National Parks accrue as revenue to the Forest Department. However revenues from tourism and recreation are minimal compared to revenues derived from timber (in 1995, this was RM 651,183 from recreation and tourism against RM 926,150,202 from royalties and permits of timber).

The tourism potential in Sarawak has also been recognised by the Sarawak State Government (Jitam in Chew, and Sim, 1997) and also the Federal Government (Hon, 1990). For example, in 1985, there was a Cabinet reshuffle and a special tourism portfolio was established.¹⁷⁸ In relation to forests, Hon, of the Ministry of Environment and Tourism in Sarawak, noted that "National Parks encompass some of the world's oldest rain-forests and spectacular natural wonders."¹⁷⁹ In addition, the tourism policy of Sarawak has been "to develop the State's tourism resources so that tourism would be considered as a means to diversify the economic base and lessen the State's over-dependence on the three major products, namely, oil, timber and natural gas."¹⁸⁰ In 1995, the Ministry of Tourism was formed to promote the orderly development of tourism in Sarawak,¹⁸¹ following the lead of the 2nd Sarawak Tourism Master Plan: 1993-2010. In line with this plan, the government specifically aimed to improve the management of longhouse visits by tourists, and to improve the management of national parks, protected areas and wildlife centres.¹⁸² In 1991, there were only 509,237 foreign visitors (excluding peninsula Malaysians and Sabahans). In 1995, this had increased to 1.03 million generating a revenue of RM 250 million.¹⁸³ The bulk of the visitors are from Brunei (54.7 per cent) and Indonesia (19.5 per cent).

¹⁷⁷ These figures are for the four national parks opened to the public; notably, the Gunung Mulu, Lambir Hills, Niah and Bako National Parks.

¹⁷⁸ Hon, D., "Tourism Potentials in Sarawak", Sarawak Gazette CXVII, No. 1513 (September 1990), p. 4.

¹⁷⁹ *ibid.*, p. 5.

¹⁸⁰ *ibid.*, p. 7.

¹⁸¹ Ministry of Tourism on <http://www.sarawak.gov.my/mot/index.html>, Last Updated: 25 May 1998. Retrieved from the internet on 3 February 1999.

¹⁸² M. Jitam, "Development Strategies for the Future in the Context of Tourism" in D. Chew and A.H. Sim, *Culture and Environment: Development Strategies for the Future*. Proceedings of Seminar on "Culture and Environment: Development Strategies for the Future", 29-30 October 1995, Kuching, Kuching: Sarawak Development Institute, March 1997, pp. 72-73.

¹⁸³ Sarawak Incorporated in Action on http://www.sarawak.com.my/green_tiger/gti97_1-3/pg10-11.html, no date. Retrieved from the internet on 3 February 1999.

Besides bringing in revenues to the state and the forest department, ecotourism also provides employment opportunities for native groups to cater to tourists, and to private business groups and individuals working in hotels, restaurants, and shopping centres. However, during the period under study, such groups were not sufficiently organised in a collective manner to voice their concerns to the state. This is because the tourism industry in Sarawak is still very young. As such, this group will not be discussed in any further detail here.

3.3 Discussion and Summary

This chapter has identified forest functions valued by interest groups and also the spatial location of groups interested in the various functions, tabulated in detail in Appendix 3.4. The listing of edible and non-edible products also indicates the diversity of forest products available from forests. Forests are multifunctional, and are of value to a diverse cross section of the community. In this respect, social coordination must take into account the allocation of all forest functions that are considered important by the various groups.

Commercial timber provided benefits that were of relevance to the state government, the Sarawak Forest Department, concessionaires, logging companies, and, to a lesser extent, native communities. In Sarawak, timber has been valued for the export revenues that it has brought to the state government for financing development programmes (27 percent of total exports), royalties and revenues collected by the Forest Department (48 percent of total state government revenue), profits (accruing to logging operators and concessionaires estimated at RM 21,000 per ha per harvest), employment opportunities to rural communities in Sarawak, and, although not often recognised, justifying the existence of a forest department to manage and utilise existing and future stands of timber.

Native groups are also significantly dependent on forests for subsistence. A review of anthropological literature in this chapter has documented the significance of forests for native groups, especially in the Fourth (Miri) and Seventh (Kapit) Divisions of Sarawak (which have a total of 6.57 million ha of the 8.43 million of forests in Sarawak). Logging has been intense in these divisions which explains the many disputes arising between

native groups and logging companies in those divisions. The traditional practice of shifting cultivation of hill *padi* remains a very important function supplied by forests although modernisation has diluted the dependence on shifting cultivation (Bugu, 1995). Eighty percent of Sarawak's native population are rural based with a continuing reliance on shifting cultivation as a means of subsistence (Jawan, 1994; Morrison, 1996; Bevis, 1995; ITTO, 1995; Padoch and Peluso, 1996; Parnwell and Bryant, 1996). Shifting cultivation is also closely tied to the religious and cultural life of native communities. Logging has impinged on native livelihood, dissipating subsistence, religious and cultural benefits accruing to these groups.

A high proportion of natives also rely on edible and non-edible forest products for subsistence, and for obtaining cash incomes to supplement their livelihood. Studies of the various native groups in Sarawak have reported the importance of a diverse range of forest products used for subsistence, including timber, game, rattan, sago, wild vegetables, poisons, medicines, and fruit, in addition to *garu*, birds' nests, and *illipe nut* which are exchanged for cash. Around fifty percent of food sources of some native groups come from forests, in addition to rice from shifting cultivation areas, domestic and livestock cultivation of animals, vegetables, and fruit. In recent years, the reliance for some traditional products like medicines and also the use of materials for manufacturing agricultural implements have diminished in certain areas, but for communities living in the interior of Sarawak, forest products remain crucial for subsistence, and in some instances, an important source of income.

Forests also provide areas for native groups to build their longhouses, huts, and to bury their dead. Native religion and culture accords deep respect for the dead who are buried in forested areas and also along river banks in the case of the Penan. It is believed that universal order is maintained when burial grounds in forests and adjoining areas are left undisturbed. Such areas perform this vital function sometimes overlooked by logging companies in their harvesting operations.

Forest cover has also been identified to be important in preventing soil erosion and regulating water flows (catchments). From an environmental and ecological perspective,

the function of forests in preventing soil erosion and regulating water flows and catchments is also of concern to WWFM, ITTO, and SAM. But nevertheless it has been native groups which have been directly affected as their livelihoods are dependent on regular supplies of clean water for drinking, and washing, and also for providing sources of protein. Forest cover is also important for water catchments, especially the potential of the Bakun Dam in supplying future energy supplies to peninsular Malaysia and Sarawak.

The ecological role of forests was also noted in this chapter. Local and international conservationists (under the umbrella of WWF and WWFM representing nature lovers) stress that wide areas of forest habitats in Sarawak need to be conserved for the maintenance of ecosystems. WWFM has been actively involved in conservation activities in Sarawak, documenting research findings, the species richness of plant and animal biodiversity in Sarawak, and arguing for the constitution of totally protected areas (TPAs). WWFM has also stressed the need to conserve as extensive areas as possible to ensure the sustenance of ecological chains and of human existence, and the exclusion of logging and commercial agricultural activities in such areas.

Last, forested areas provide recreation and tourism opportunities. The Sarawak Forest Department recognised this significance, and has provided recreational and hostel facilities in the various National Parks throughout Sarawak and monitored tourists (local and international) coming to these areas. The Department noted that increases in tourist numbers in recent years parallel the increased number of constituted National Parks and the increased provision of recreational facilities in such areas. In addition, private business groups like hotels and retailing industry, and native communities also benefit from ecotourism.

Chapter 4

Definition and Enforcement of Property Rights for the Various Forest Functions

4.1 Introduction

The previous chapter identified forest functions considered important by the various interest groups within and outside Sarawak (part a of analytical framework). This chapter proceeds to part b (subdivided into parts b(i), b(ii), and b(iii)) of the analytical framework to examine the definition (parts b(i) and b(ii)) and enforcement (part b (iii)) of property rights in Sarawak. Clearly defined and enforced rights¹ allow market or politics to signal information about the values of forest functions to all users interested in forests, and to provide incentives for interest groups to take into account the concerns of other groups interested in forests.²

The outline of this chapter is as follows. Section 4.2 provides an overview of forest policies and legislation, and of their administration. Section 4.3 reviews the analytical framework in Section 2.6 that is relevant to this chapter. Sections 4.3.1 to 4.3.7 examining in detail the definition and enforcement of rights of the various forest functions in line with parts b(i), b(ii), and b(iii) of the analytical framework. Section 4.4 concludes.

4.2 Forest Policies and their Administration

In order to understand the background behind forestry conflicts in Sarawak, it is necessary to have some familiarity with the policies and ordinances under which forest use is governed, and the manner in which they are being administered.

The Forest Policy 1954 is the official policy of the Sarawak State Government that recognises the multifunctional character of forests.³ This policy includes reserving forests permanently for the benefit of present and future generations to ensure that the economic,

¹ This includes the right to use and appropriate benefits, right to exclude non-owners with penalties stated for violations, and right to transfer.

² No ambiguity over individual rights and also security of ownership over a long period of time especially in the case of forests. See I. Wills, *Economics and the Environment: A Signalling and Incentives Approach*. Australia: Allen and Unwin Ltd., 1997, p. 23.

³ *Forestry In Sarawak Malaysia*, Kuching, Sarawak: Forest Department, 1991, p. 5.

environmental and social needs of all Sarawakians are considered.⁴ The objectives of reservation are to maintain sound climatic and physical conditions in the State: to safeguard soil fertility, supplies of water for domestic and industrial use, for irrigation and general agricultural purposes; to prevent land damage by flooding and erosion to rivers and agricultural land; and to ensure supplies in perpetuity and at moderate prices of all forms of forest produce required by the population for agricultural, domestic and industrial purposes. Forests in Permanent Forest Estates (PFEs)⁵ have to be managed to obtain the highest possible revenue compatible with the principle of sustained yield⁶ with the above objectives in mind. The Forest Policy also requires, as far as practicable, a thorough and economical utilisation of forest products on land not included in the category of PFEs, prior to alienation of such land. It requires the economic utilisation of forest resources and the promotion and development of a profitable export trade based on forest produce. Guidelines or objectives of forest management are implemented through legislation contained in various ordinances passed by the Legislative Assembly. Forest related and user rights in legislation are enforced by officers in the Sarawak Forest Department, and certain environment related rights by officers in the Natural Resources and Environment Board. Ownership rights in relation to forested land areas are enforced by officers in both the Sarawak Forest Department and the Land and Survey Department. Both departments operate under the umbrella of the Ministry of Resource Planning. The courts serve to uphold legislation in instances that warrant action by the judiciary, for example, in the imposition of imprisonment terms and the determination of punishments for forest crimes. Appendix 4.1 provides a diagrammatic overview of the functions of the legislative assembly, executive assembly, and judiciary in Sarawak.

Ordinances related to the constitution, maintenance, and regulation of forest use in Sarawak are the Land Code (Sarawak Cap. 81) 1958, Forests Ordinance (Sarawak Cap. 126) 1954, National Parks Ordinance (Sarawak Cap. 127) 1956, and the Wild Life

⁴ *Forestry In Sarawak Malaysia*, op. cit., pp. 5-6 and see also *Annual Report of the Forest Department Sarawak, 1982*, p.2.

⁵ Permanent Forest Estates other than the sub-category of Communal Forests are designated as forests that will supply timber and other forest products for Sarawak's benefit in perpetuity.

⁶ Sustained yield refers to the rate of harvesting that allows forests to provide an equivalent cut at the next felling cycle. See International Tropical Timber Organization (ITTO), *Report Submitted to the International Tropical Timber Council by Mission Established Pursuant to Resolution I (VI) "The Promotion of Sustainable Forest Management: A Case Study in Sarawak, Malaysia"*, ITTC (VIII)/7, 7 May 1990, p. 128.

Protection Ordinance (Sarawak Cap. 128) 1958. Together they provide for the creation of property rights for the various forest functions, and they also regulate the management, use, transfer, and enforcement of rights with respect to each forest function.

The Land Code provides for the recognition of existing informal native rights and the creation of new rights (shifting cultivation, ownership of edible and non-edible forest products, native abodes and graveyards).⁷ It also delineates ownership of land between state, native communities, and non-native communities, thus respecting the use and transfer of land (including forested areas) for its various purposes. In this respect, five categories of land in Sarawak (Section 2 of Land Code (Sarawak Cap. 81) 1958) are provided to segregate ownership along these lines. Titled private land that can be owned by any Sarawakian (native and non-native) is termed 'Mixed Zone Land'. 'Native Area Land' is land with individual titles to be held by natives only.⁸ 'Native Customary Land' is land which is untitled and held by natives.⁹ 'Reserved Land' is land which belongs to the State and is used for purposes like forestry, agriculture, and industrial projects. The final category of land is 'Interior Area Land' which is land deep in the forests of Sarawak which is untitled and unsurveyed. This last category of land can be constituted for any purpose considered suitable by the state.

How does the Land Code relate to forest management? It is linked to forest management because informal native customary rights recognised by the state (Native Customary Land) may exist in forested areas that are in the process of being formally constituted for another purpose. As such, the Land Code is used together with the Forest Ordinance to clarify how existing rights to such areas can be dealt with.

⁷ Hence the Land Code represents recognition in legislation of the procedures involved in the creation of native customary rights in forests.

⁸ Such titled land is given to natives in the form of a grant in perpetuity free of premium of rent and any other charges (Section 18 (1) of the Land Code (Sarawak Cap. 81) 1958). Prior to 1974, this land was in the form of a 99 year lease used for agricultural purposes only but an Amendment to the Land Code changed this to a grant in perpetuity (Sarawak Ordinance 2/74).

⁹ This is land whereby native customary rights have been created prior to 1958, or land granted by the Minister for the exercise of native customary rights or Interior Area Land which is used for the exercise of native customary rights under permission of the district officers.

The Forests Ordinance recognises customary rights and contains directives for settling existing informal native rights when forests are in the process of being formally constituted for another purpose. The Forest Ordinance also aims to provide legislation in relation to the protection and management of forests, to regulate the taking of all types of products from the various forest categories by the different forest groups, and is an encapsulation of the Forest Policy formulated in 1954.

The Wild Life Protection Ordinance and National Parks Ordinance are related to the management of forested areas specifically to protect and conserve animal and plant materials (biological diversity) found in forests.

The Forest Ordinance is supplemented by the Natural Resources and Environment (Amendment) Ordinance. This ordinance contains provisions to further safeguard environmental concerns, in particular, the sustainable management and utilisation of natural resources in the state. For logging, an Environmental Impact Assessment (EIA) needs to be undertaken¹⁰ in areas exceeding 500 hectares that have previously been logged, or in respect of coupes which have been previously declared as closed by the Director of Forests. The other instance where an EIA is required is in the situation where logging is undertaken in a water catchment area.¹¹ This ordinance is enforced by the Natural Resources and Environment Board, also under the umbrella of the Minister of Resource Planning. However, for the purposes of this chapter, it should be noted that the previous four ordinances administered by the Sarawak Forest Department are more relevant as they cover the major and day-to-day aspects of forest use in Sarawak.

- *Administration of Forest Policies*

There are three branches of government in Sarawak: the Legislative (Legislative Assembly), Executive (consisting of the various ministries to carry out and enforce legislation) and Judiciary.

¹⁰ See *A Handbook of the Policy and Basic Procedure of Environmental Impact Assessment (EIA) in Sarawak*. Sarawak, Malaysia: Natural Resources and Environment Board, 27 January 1995, pp. 34-37.

¹¹ The Natural Resources and Environment (Prescribed Activities) Order, 1994, *The Sarawak Government Gazette Part II*. Vol. XLIX, No. 20. 18 August 1994.

Legislative decisions (enactment and changes to laws and ordinances) are carried out by the State Legislative Assembly, while executive decisions in relation to the use of forests (enforcement of ordinances related to the Forest Policy 1954) is mainly undertaken by the Sarawak Forest Department, under the umbrella of the Ministry of Resource Planning. Decisions to use forests for logging, or to establish a National Park, or for commercial agricultural schemes rests with the Minister of Resource Planning and, in theory, is also based on consultation with the Director of Forests (Lian, 1987). The various Section Offices in Kuching, Sibul, Bintulu, and Miri that are in charge of law enforcement, revenue collection, and the implementation of management plans and forest engineering plans in their respective areas.

The ownership and formal categorisation of land is undertaken by the Land and Survey Department of Sarawak and recorded in its Land Register, while disputes over informal land ownership are mediated by the district officer in the same department.¹² Over 60 percent of land in Sarawak has not been surveyed and formally delineated due to the financial constraints of undertaking such a task. In practice, the process of constituting forested areas for logging or conservation is carried by officers in the Sarawak Forest Department,¹³ even when the area of land has not been formally ground surveyed by the Department of Land and Survey. These lands are then 'leased' out to concessionaires who obtain the right to harvest timber.

The Sarawak Forest Department, established in 1919, is entrusted with the task of managing and conserving forests in accordance with the Forest Policy 1954. The Department is also empowered to enforce legislation in the Forests Ordinance, the Wild Life Protection Ordinance, and the National Parks Ordinance. Basically, the enforcement responsibilities for the Forest Department¹⁴ include: first, protection of PFEs, National Parks and Wild Life Sanctuaries from encroachment and illegal logging; and, second,

¹² Each division in Sarawak is managed by a Resident and is, in turn, sub-divided into districts which are under the administrative control of district officers.

¹³ Procedures set out in Sections 5 and 27 allow for the Forest Department to constitute forested areas as PFEs. This will be further discussed in Section 4.3.1.

¹⁴ Protection Branch of the Sarawak Forest Department is in charge of investigating, evicting and enforcing property rights to forests. In addition, it also has the role of constituting forests for its various purposes.

ensuring that logging companies adhere to legislation in the Forests Ordinance, through management and forest engineering plans. The management and forest engineering plans together take into account native customary rights in forests, and the ecological and environmental functions of forests in existing areas.

4.3 Forest Functions and the Specification of Property Rights: Overview

The approach adopted in this chapter to examine the definition and enforcement of property rights follows part b of the analytical framework discussed in Section 2.6. A more thorough discussion is provided here.

b. (i) Definition of Property Rights: Identification (Recognition) of a Particular Function in Legislation

In Sarawak, evidence for identification of a forest function involves recognition in legislation of the right to formally establish (constitute) forested areas for a particular function, or the recognition in legislation of procedures that empower native communities in Sarawak to establish rights to a forest function.

The formal establishment (constitution) of legal rights to forest functions in Sarawak involves a proclamation that a certain forested area will be used for a particular purpose and it involves specifying details on the situation (location of area) and extent (size) of the forested area. This applies to areas for timber harvesting, preservation of ecological systems, titled (formal) native customary areas, regulation of water flows and soil erosion, and recreation and tourism. Constitution includes procedures that allow for pre-existing informal rights in a particular forested area to be declared and to co-exist, or for removal of such rights to be resolved either through compensation and/or the provision of alternative areas. Details of land which have been constituted in this manner are then formally recorded in the Land Register. Constitution of PFEs involves ground surveys by the Department of Land and Survey, but this can be waived with the issue of a temporary

land lease, as long as procedures detailed in Sections 4, 5, and 27 of the Forest Ordinance has been followed.¹⁵

For native community rights where untitled or informal rights exist for shifting cultivation, edible and non-edible forest products, and native abodes and native graveyards (forested areas containing these rights make up over 23 percent of Sarawak's land area), identification involves a recognition in legislation of the informal procedures that have been carried out by natives themselves (clearing of forests for cultivation, settlement through the establishment of longhouses, placing of burial artefacts) to create such rights.¹⁶ For edible and non-edible forest products, the specification of native rights involves a recognition of procedures involved in 'marking' such products, or, in the case of game animals, of the location of animals in a particular native area.

The identification of a particular forest function does not always include detailed measurement. For some functions, details on the extent (size) of the area allocated for a particular purpose is sufficient, but in the case of timber and biodiversity, measurement includes an inventory to track future resource use (timber extraction) or resource potential (biodiversity) of a particular area.

b. (ii) Definition of Property Rights: Identification of Right Holders, Precise User Rights and Detailing of Penalties in Legislation

Definition also includes recognition in legislation or in official documents of right holders' property rights to use, to enjoy income or benefits, to transfer the use of a function to another party, and to exclude others from a particular function, which includes access to means (forest department officers, courts) of penalising illegitimate users for encroachments. Clearly defined rights also include secure property rights where procedures are available to safeguard and allow for the continuance of rights that have been established, and of clear or standardised rates of compensation (based on market values or on traditional native methods of compensation) where such rights are revoked. If

¹⁵ This is discussed in greater detail in Section 4.3.1 of this chapter.

¹⁶ Such procedures are only legally recognised if they had been carried out prior to 1 January 1958.

all conditions in parts b(i) and (ii) are satisfied, then rights to that function are precisely defined.

b. (iii) Enforcement of Property Rights: Monitoring, Supervision, and Imposition of Penalties

Evidence for enforcement includes furnishing details on monitoring by the Sarawak Forest Department to exclude and to penalise illegitimate forest uses in forested areas. Evidence of exclusion may also include fencing and boundary demarcation in forests where appropriate. Also enforcement includes supervision activities to ensure that timber harvesting complies with the regulations set to protect the timber and non-timber concerns during the process of logging. Strict enforcement makes a function exclusive, that being one of the basic prerequisites of social coordination. In cases where timber and non-timber rights have been encroached upon or revoked, enforcement must include the imposition of penalties, or the payment of compensation to the affected parties respectively. Such conditions are necessary for property rights to a particular forest function to be wholly enforced.

4.3.1 Commercial Timber and Logging

For timber harvesting, the major ordinance regulating the use of forests is the Forests Ordinance (Sarawak Cap. 126) 1954, and minor parts of the Land Code (Sarawak Cap. 81) 1958. The Sarawak Forest Department is the main body that oversees the definition and enforcement of rights to timber.

- Defining Rights: Identifying Timber in Forests Via Constitution of Permanent Forest Estates (Forest Reserves and Protected Forests) [Part b(i)]

The function of forests in supplying timber has been recognised in legislation (Parts II and III of the Forest Ordinance). Forests are divided into two categories: Permanent Forest Estates (PFEs) and State land Forests (SFs). PFEs consist of Forest Reserves, Protected Forests, and Communal Forests of which the first two sub-categories are designated for

timber harvesting.¹⁷ SFs are forested areas where either constitution into a PFE is yet to be undertaken, or areas destined to be converted to non-forest uses like commercial, agricultural or industrial purposes.

Identification procedures for constituting PFEs involve taking into account any other existing rights in these areas. Ideally, compensation in kind or in monetary form is offered for the loss of pre-existing rights.¹⁸ In Sarawak, land is supposed to be ground surveyed by the Department of Land and Survey before constitution can proceed. However, in constituting forested areas for PFEs, a provisional 'lease' is known to be issued by the Department of Land and Survey if an immediate ground survey is not practicable (Section 28 of the Land Code). In such instances, such land can still be claimed as a PFE as long as the government has gone through the procedures of constituting PFEs following Sections 4, 5 and 27 of the Forest Ordinance.¹⁹

First, constitution involves a declaration by the Minister of Resource Planning (on the advice of the Director of Forests), subsequently notified in the Sarawak Government Gazette (as per Section 4 of Forests Ordinance) of an area designated as a PFE.²⁰ The notification is issued in the form of a Proclamation in English and Malay or any other language, specifying the location and size of the forest area proposed as a Forest Reserve or Protected Forest (Section 5 of the Forest Ordinance); in effect, measuring the extent of an area designated for the purposes of timber harvesting.²¹ An interval of at least three

¹⁷ Forest Reserves are afforded the strictest form of control whereas Protected Forests allow for native customary rights (except shifting cultivation) to exist with commercial timber harvesting rights. This was undertaken as a stop gap measure to counteract native resistance to the exclusion of forested areas for timber harvesting. Communal Forests although categorised as PFE is not designated for commercial timber harvesting but for native communal needs. This category of forests will be discussed in more detail in Section 4.3.3.

¹⁸ Appeals against the compensation offered could be made to the Resident within a period of fourteen days and subject to provisions in Sections 15 and 16 then will be final. Both sections give power to the Minister of Resource Planning to commute a right for compensation either in monetary form or for a similar right or privilege exercisable elsewhere.

¹⁹ Confirmed through discussion with researchers and also an anonymous contact from a logging company in Sarawak.

²⁰ The creation of Forest Reserves is dealt with in Sections 3 to 16, that of Protected Forests in Sections 25 to 35 of the Forests Ordinance (Sarawak Cap. 126) 1954.

²¹ However in terms of measuring benefits as per the analytical framework in Section 2.6, there is a second stage where inventories need to be carried out by the Sarawak Forest Department and the logging company to measure the timber content in an area in order to assess royalties and taxes.

months is allowed for objections, claims, and appeals to be raised.²² When all objections, claims and appeals have been settled by the district officer, the minister²³ publishes another notification in the Gazette stating the date when the specified area becomes a Forest Reserve or a Protected Forest. Areas of Forest Reserves and Protected Forests can be revoked by the minister (Section 24 for Forest Reserves and Section 39 for Protected Forests). This creates an element of uncertainty for the Forest Department which is given the task of overseeing and leasing out these areas to concessionaires.

Constitution when implemented on the ground has had some problems. This has arisen because native rights, although recognised in legislation, have not been formally recorded in the Land Register of the Department of Land and Survey. In cases where natives are aware that their lands are being excised, constitution has been a protracted process involving a drawn-out settlement of disputes. This has resulted in delays in constitution; between 1966 and 1974, no forests were constituted because disputes could not be settled (*Annual Report of the Forest Department Sarawak, 1974*). Constitution has also disadvantaged natives living deep in the interior. Although procedures for the constitution of forests have safeguards for affected parties to voice their objections when their lands are in the process of being excised, Hong (1987) points out that it has been "impossible for the unlettered native living in the far interior to gain access to information in a Gazette announcing the designation of his or her land as a Forest Reserve or Protected Forest. It is thus even more unlikely that he can place an objection against such a declaration within the three-month period."²⁴ For example, a native in Kapit has reported an incident where a logging concession included fallow farmland areas and even the longhouse itself.²⁵ Another native in Long Banyok in Marudi reported that the native customary right land occupied by his group was given away to the timber companies, and was subsequently

²² During this interval, no new rights can be acquired or exercised (Section 6 for Forest Reserves and Section 30 for Protected Forests). At least a period of three months is provided for any objections or claims by any affected party with respect to the specified area (Section 5(d)). These claims or objections together with particulars must be made to the district officer verbally or in writing.

²³ Subsequent references to the minister in this chapter, unless otherwise stated, refer to the Minister of Resource Planning.

²⁴ E. Hong, *Natives of Sarawak: Survival in Borneo's Vanishing Forests*. Malaysia: Institut Masyarakat, 1987, p. 76.

²⁵ ITTO, 1990, op. cit., p. 150.

bulldozed and flattened.²⁶ Another such instance is the case of the Melana Protected Forest being gazetted and licensed for logging without the natives concerned being aware of its gazettelement.²⁷ Even in cases where natives were aware that their rights are being extinguished, but where validity has not been challenged within a set of period of time, such rights have been extinguished as illustrated in *Jok Jau Evong & Ors v Marabong Lumber Sdn Bhd & Ors* [1990].

- *Defining Rights: Identifying Precise User Rights Held for Timber (Use, Transfer, Exclusion, and Details of Penalties) [Part b(ii)]*

This discussion here will be divided into four sub-headings which discuss the creation of user rights in Permanent Forest Estates, user rights in State land Forests, harvesting rights in management plans, and user rights in the concession system. Rights in these four aspects have influenced the manner in which timber has been harvested which in turn has affected social coordination in the use of forests.

Creation of User Rights in Permanent Forest Estates (PFEs): Forest Reserves and Protected Forests [Part b(ii)]

The right to harvest timber is established through the issue of a licence which gives the licensee the right to extract timber from a given area. The Director of Forests through consultation with the Minister of Resource Planning grants such licences to individuals or corporate entities known as concessionaires.²⁸ Besides the right to revoke rights by the state,²⁹ there are also no guarantees of lease renewals (Arentz, 1996; Lian, 1990).

²⁶ ITTO, 1990, op. cit., p. 176. SAM also cites examples where areas with native customary rights were excised without knowledge of the natives themselves until the actual logging began taking place and such areas were destroyed. See *The Battle for Sarawak's Forests*, Second Edition, Malaysia: World Rainforest Movement and Sahabat Alam Malaysia, 1990, p. 208.

²⁷ M. Cleary, and P. Eaton, *Borneo: Change and Development*. Kuala Lumpur: Oxford University Press, 1995, p. 182.

²⁸ Usually business organisations belonging to politicians, relatives of politicians, political allies, and civil servants; or government agencies like the Sarawak Timber Industry Development Corporation and the Sarawak Foundation. See F.J. Lian, *Farmers' Perceptions and Economic Change - The Case of Kenyah Farmers of the Fourth Division, Sarawak*. Unpublished PhD Thesis, Australian National University, July 1987, p. 173 and also H. Thompson, "Malaysian Forestry Policy in Borneo", *Journal of Contemporary Asia* 23, No. 4 (1993), p. 511.

²⁹ Section 63 introduced in 1979 states that no person shall have any right, upon the expiration of the licence or permit issued under the Forest Ordinance, to any renewal. Section 51A introduced in 1987 gave powers to the Director of Forests to suspend licences or permits. Appeals against the cancellation or suspension of licences by the Minister can be made to the *Yang di-Pertua Negeri* (Governor) in Council whose decision

Concessionaires' rights are limited as they are only given the rights to harvest timber according a management plan³⁰ but are insecure as such rights may not be renewed. For this reason and others that will be discussed, there will be incomplete incentives by concessionaires to care for and to manage forests, or to engage in longer term investments as future benefits may not be retained by the concessionaires once the lease expires. The ensuing discussion of the concession system in Sarawak points out the environmental damage caused by timber harvesting because of the limited rights of the concessionaires.

The first sub-category of PFEs, Forest Reserves, is accorded the strictest form of controls. The right to harvest timber on a commercial basis from Forest Reserves is regulated through the issue of a non-transferable licence or permit (Section 49(2))^{31 32} The licensee (concessionaire) has the right to extract timber subject to a management plan, and forest engineering plan as set out in an agreement between the Forest Department and the concessionaire.³³ See Appendix 4.2 for a description of the structure of the concession system. Fees, royalties, premiums, and other payments are fixed by the Director of Forests in the management plan. Both plans will be discussed later.

In legislation, the right to harvest is granted through the tendering system where the highest bidder wins. But in practice, such licences have been granted to 'friends and relatives' of the past and present ruling faction without tenders (Colchester, 1990; Jawan, 1994).³⁴ As such, the concessionaire who has obtained the right to harvest may not be the party who values this right the highest but rather the entity with the right political connections. Furthermore, even the contractors and sub-contractors are linked to the concessionaire due to the syndicated nature of the timber industry (Leigh in Hirsch and Warren, 1998). As such, contracting and subcontracting tasks are again awarded without

will be final. After that, the Director may with the approval of the Minister transfer the licence or permit to another person with respect of the said area.

³⁰ Formally encompassed in the management plan of each concession. The management plan will be discussed later in this section.

³¹ unless if director of company dies, is incapacitated, or bankrupt or if holder of company itself is liquidated - Section 2(2A).

³² Non transferability was explicitly introduced in Forests (Amendment) 6/87, *The Sarawak Government Gazette Part 1*. Vol XLII, No. 23. 30th November 1987, No. 2.

³³ The harvesting of timber is also governed by the forest engineering plan that aims to minimise the impact of harvesting on the environment. The will be discussed in Section 4.4.6 when issues related to soil erosion and water catchment are discussed.

tender.³⁵ Rights are attenuated as they cannot move to individuals who will prize them highest, thus removing one important prerequisite for social coordination: the transferability of property rights to groups that value it the highest.

Rights have been defined to include exclusion of non-right holders from timber areas. Intrusion into Forest Reserves under section 21 of the Forests Ordinance is punishable by fines.³⁶ Offences can be compounded (instant fines) for a sum of money not exceeding twice the value of the forest produce; or a sum not exceeding RM 200;³⁷ or just for the actual value of the forest produce for which the offence has been committed. Heavier penalties apply if the offence is brought to court.³⁸ Penalties are heavy enough to deter native groups from intruding into such areas, considering that native groups earn around RM 250 per month from the sale of non-timber products. However, since the probability of detection is negligible in the more remote areas, these penalties may not deter violations effectively; thus the concessionaires' rights are inadequately enforced.

Protected Forests are the second sub-category of PFEs. Basically Protected Forests differ in one respect from Forest Reserves, in that natives are allowed to collect timber and other forest produce required for personal use; but not for sale, barter or profit (Section 65(1)). Apart from the rights given to natives in Protected Forests, Section 36 forbids activities like shifting cultivation. Again, there are exclusion clauses and penalties for the contravention of rights to protect these forests.³⁹

³⁴ This will be discussed in detail in Chapter Five.

³⁵ F.J. Lian, "The Timber Industry and Economic Development in Sarawak: Some Contemporary Trends and Proposals for 1990 and Beyond", in A.M.M. Salleh, H. Solhee, and M.Y. Kasim, eds., *Socio-Economic Development in Sarawak: Policies and Strategies for the 1990s*. Proceedings of a Seminar held at Kuching, Sarawak, October 10-12, 1988, Kuching, Sarawak: Angkatan Zaman Mansang (AZAM), 1990, p. 125.

³⁶ Section 21 includes prohibitions to exclude forested areas solely for timber harvesting.

³⁷ This refers to offences like trespassing and allowing cattle to pasture and trespass into Forest Reserves and Protected Forests.

³⁸ Sections 77, 78, and 79 of the Forests Ordinance detail the monetary fines in court trials for the violation of acts in Section 21. They range from RM 50 for trespassing into such areas, RM 200 for lighting a fire, to a minimum sentence of RM 1000 and 6 months imprisonment for the illegal removal of forest products, or shifting cultivation or damage to trees in such areas. This was subsequently increased in 1979 to an imprisonment term of one year; and a fine of ten times the value of the forest produce or RM 2,000, whichever is greater (Section 79).

³⁹ Fines are compounded as per Forest Reserves. The conditions for harvesting timber in Protected Forests are similar to that of Forest Reserves and are regulated according to Section 49 through the issuance of a non-transferable licence or permit.

Creation of User Rights in State land Forests (SFs) [Part b(ii)]

In areas that have not been or are not constituted as Forest Reserves or Permanent Forests, non-transferable licences⁴⁰ are also issued for the removal of forest produce. Rights in such areas known as State land Forests are exclusive and user rights are clearly stated although the licence is again non-transferable, with penalties for the contravention of such legislation. User rights are similar to that of Protected Forests in that natives can collect forest products from such areas.⁴¹ For Interior Area Land, any native who without a prior permit from the district officer occupies any Interior Area Land (unclassified land) or fells or attempts to fell virgin jungle upon any such lands after 1958 is subject to penalties.⁴² Hence exclusion also exists for such areas but with the lack of enforcement, incentives for native groups to adhere to this legislation will again be minimal resulting in incomplete social coordination as per the analytical framework in Section 2.6.

Harvesting Rights in the Management Plans of PFEs and SFs [Part b(ii)]

Every concession, whether in PFEs or State land Forests (SFs) has to comply with a management plan (categorised as a Working Plan in PFEs and as a Felling Plan in SFs) drawn up by the Forest Department.⁴³ Property rights for harvesting timber are governed

⁴⁰ Unless if the director of a company dies, is incapacitated, or bankrupt, or if the holder of the company itself is liquidated - Section 2(2A).

⁴¹ Without a licence or permit, no person can cut, collect or remove any kind of forest produce for commercial purposes (Section 50 of the Forest Ordinance). Natives, however, are allowed to remove any forest produce from State land Forests (Sections 50 and 65 of the Forest Ordinance). The penalty for unlawfully removing any forest produce from State land results in an imprisonment of three months and a fine of ten times the value of the forest product or RM 500 whichever is greater (Section 80 of the Forest Ordinance). This was subsequently increased fourfold in 1979 to RM 1,000 for the first offence and RM 1,000 and six months imprisonment for second and subsequent offences.

⁴² In the case of a first offence, a fine of RM 500; and for subsequent offences, a fine of RM 500 and an imprisonment of three months (Section 10(3)). For court convictions, offences are as follows: a sum not exceeding RM 500 by way of compensation for the offence committed; and where property has been seized, payment of the value thereof as estimated by the officer (Section 209F). Penalties are not only imposed for unlawful occupation but also extended to situations in which a building is erected (Section 209(1a)); and clearing, ploughing, digging, enclosing and cultivation of any State land area (Section 209 (1(b))).

⁴³ This is in line with Section 49 of the Forests Ordinance (Sarawak Cap. 126) 1954 for Forest Reserves and Protected Forests; and Section 51 of the Forests Ordinance (Sarawak Cap. 126) 1954 for SFs. A detailed management plan can be found in International Tropical Timber Organization (ITTO), *Ten-Year Development Plan for the Model Forest Management Area - Sarawak (MFMA), 1996-2006: Forest Land Use and Management Plans Training, Research and Development and Demonstrations*. ITTO Project PD 105/90 Rev. 1 (F). Japan and Malaysia: International Tropical Timber Organization and Forest Department, Sarawak, 1996, pp. 140-168.

by this plan to ensure that forested areas containing timber can be harvested on a long term and sustained basis. The management plan provides information on the topography (slope of terrain), geology (rock formations), soils, and accessibility of the area. Selective felling is practiced with the harvested area (block) being allowed to regenerate naturally while the next block is being worked on. The plan also defines precise user harvesting rights in a given forested area and also penalties for contravention. Besides forbidding re-entry after the closure of a block, the plan also specifies types of timber that can be harvested, the minimum cutting diameter limits,⁴⁴ the annual harvest area in specific blocks, volume of timber to be harvested, penalties for damaging residual trees, protected tree species which cannot be felled, and royalties payable for the different species of timber (ITTO, 1996). However, the loggers' responsibility for a particular area ends with the harvesting cycle.

Compliance to the management plans is overseen by officers from the Sarawak Forest Department (Forestry in Sarawak Malaysia, 1991;⁴⁵ ITTO, 1996; WWF, 1989). The management plan includes provisions for field checks of areas demarcated for logging, inspection of plans for road locations, inspection of the roads itself, inspection of blocks where logging is in progress, inspection of areas where logging operations have been completed, and imposition of penalties for non-compliance to any of terms stated in the plan.⁴⁶

Penalties are imposed for illegally exporting timber,⁴⁷ for falsifying the type of timber extracted, for evasion of royalties and payments, for altering boundaries, and for illegally possessing timber logs. Penalties were generally too light to be effective (marginal costs of committing crime multiplied by the probability of being detected appeared less than the

⁴⁴ The cutting diameter limits, usually diameter at breast-height (dbh) and diameter at top of the buttress (dtb), are specified for the various types of forests. In SFs, minimum size restrictions are not applied to areas designated for agricultural plantations. The same restrictions apply to SFs to be proposed as future PFEs. Concessionaires are permitted to increase their yields by harvesting smaller trees but this is highly selective as it is dictated by the needs of the market. Penalties were imposed for overharvesting in 1993.

⁴⁵ Additional information on the forest management plans was obtained from the internet: <http://www.mtc.com.my/fpub/lib/fsm/fsm9.htm> on 7 March 1996.

⁴⁶ International Tropical Timber Organization (ITTO), *Ten-Year Development Plan for the Model Forest Management Area - Sarawak (MFMA), 1996-2006: Forest Land Use and Management Plans Training, Research and Development and Demonstrations*. ITTO Project PD 105/90 Rev. 1 (F). Japan and Malaysia: International Tropical Timber Organization and Forest Department, Sarawak, 1996, pp. 140-168.

marginal benefits),⁴⁸ until 1993 when more severe penalties (RM 50,000) were introduced.⁴⁹ Also in 1993 penalties for overharvesting were increased to an imprisonment of five years and a fine of RM 50,000.

Although there are regulations for controlling the area and volume of annual harvesting, and penalties for damaging trees in the management plan (penalties of RM 10-15 per tree), there are no incentives for the logging contractor (or concessionaire) to comply beyond the current harvest. This is partly due to natural regeneration of forests (reforestation) being the policy norm of the Forest Department. It has also always been the case that the concessionaire who owned the right to harvest in a particular area was not responsible for contravening regulations in the management plan because harvesting is contracted out to a contractor who supervises and carries out the felling operations. This dichotomy had resulted in concessionaires not participating in harvesting operations⁵⁰ and has also diluted the direct control that can be exerted by the Forest Department on the concessionaire. This was only rectified in 1993 in an amendment to the Forest Ordinance when concessionaires were held to be directly responsible for logging operations regardless of agreements made with the contractor.⁵¹

Management plans ignore one very important aspect of timber harvesting in that timber transportation along rivers and its environmental and social impacts was neither regulated nor defined until the Sarawak Rivers Ordinance, 1993.⁵² This has resulted in logs causing adverse environmental impacts on water quality⁵³ and navigational hazards.⁵⁴ ITTO (1990) interviews with the various native groups in the Kapit and Limbang Districts have also

⁴⁷ Initially an imprisonment term of one year and a fine of RM 200. Effective 1 February 1994, this was increased to an imprisonment term of at least one year but not exceeding five years and liability of RM 50,000 (Section 83).

⁴⁸ Based on a profit figure of RM 21,000 per hectares of forests.

⁴⁹ Section 85 of the 1993 Amendment of the Forest Ordinance.

⁵⁰ Lian, 1990, op. cit., p. 122.

⁵¹ Section 88 of Forests (Amendment) Ordinance, 1993, Cap A9 of 1993, 15th November 1993 (Operational on 1.12.1993), *The Sarawak Government Gazette Part I ("A" Series)*, Vol. 1 (NS) 9th December 1993, No. A 2.

⁵² Section 45 of the Sarawak Rivers Ordinance 1993 prohibits the floating of loose logs on any river. However, personal observation while travelling through Sarawak's major rivers in December 1994 showed that this legislation was not enforced.

⁵³ M. Kavanagh, A.A. Rahim, and C.J. Hails, *Rainforest Conservation in Sarawak: International Policy for WWF*. Malaysia: WWF Project No. 3262, Nov. 1989, p. 31.

supported this observation together with personal notes recorded while travelling throughout Sarawak.^{55 56}

User rights in the Concession System [Part b(ii)]

Besides shortcomings in the management plan, the manner in which the concession system has been defined has also affected logging operations and resulted in overharvesting. The lack of synchronisation between timber leases and the natural regeneration cycle of forests is one area of contention in the concession system. In the 1980s, licences granted to most concessions typically lasted for a period of five to ten years (Lau, 1982; ITTO, 1990; WWF, 1989). Thus the duration of the concession system was less than the natural regeneration cycle of forests, with no guarantee of renewal, failing to provide incentives for concessionaires to harvest timber on a basis equal to this cycle. Short leases combined with an absence of guarantees of renewals has meant that harvesting benefits are lost upon the expiry of the licence. Again, this is exacerbated by an absence of guarantees of renewals. The result is an emphasis on maximising output prior to the expiry of the lease. An interview with Datuk Lau Hui Kiang, the Chair of Sarawak Timber Association (STA), by ITTO supports this view. Datuk Lau stated that:

If we have a licence we have got to cut and have to produce from each annual coupe; otherwise there is no more value when the licence expires. This is why members have requested longer term licences, so that production will be automatically reduced.⁵⁷

And as the STA has confirmed, not all leases have been renewed.⁵⁸

The ITTO (1990) study, covering various parts of Sarawak, also confirms this shortcoming and observes that the emphasis on output has resulted in detrimental impacts on the environment:

⁵⁴ This was evidenced in travels up river in the Rejang and Baram Rivers. Water in these rivers were chocolate brown in colour, and loose logs were afloat, especially at the mouths and banks of these rivers.

⁵⁵ ITTO, 1990, op. cit., p. 152.

⁵⁶ *ibid.*, p. 171.

⁵⁷ ITTO, 1990, op. cit., p. 126.

⁵⁸ *ibid.*, p. 128.

The practice of issuing licences for shorter than the felling cycles, without any guarantee of renewal, is not helpful to long term management. It tends to reward those concessionaires and operators who plan their operations so as to get the maximum possible output with the minimum possible fixed investment in plant, roading, training, safety or infrastructure regardless of the effects on the variability of the concession over the remaining years of the felling cycle. ...

The concession system, in effect tends more to frustrate than to facilitate the sustainable management of even the Permanent Forest Estate. This result may be accidental, but this is the way the system works.⁵⁹

In addition, legislation has not defined how this system functions in terms of the contracting out of timber operations. This has resulted in a system which again has emphasised the maximisation of output. This was reported in an investigation of logging operations in the Baram region of Sarawak by Lian (1990), and is supported from studies of other regions in Sarawak and elsewhere (Burgess, 1989; Dauvergne, 1997; Leigh in Hirsch and Warren, 1998; Panayotou and Ashton, 1992).

In Sarawak, the licensee (concessionaire) earns income with little or no involvement in the actual processes of logging. Operations are in the hands of a contractor who organises and coordinates extraction and production activities (felling, hauling, transporting, rafting, barging, towing, and leading) by supervising and advising a chain of sub-contractors; in addition to providing infrastructure like roads, and the general marketing of timber. Sub-contractors hired by the contractor are paid on a piece rate basis which is "determined by their efficiency in minimizing costs and the volume of timber extracted or handled."⁶⁰ Output maximisation is the prime objective, and this, according to Lian, "... is seen as one of the major causes of the overall weakness of the industry, especially in our effort to sustain the yield and production of our forest resources. It is also a main cause behind major destructive impacts of the industry."⁶¹ Lian points out that "having a timber licence is the easiest, fastest and most assured means to become rich."⁶² The attitude of the

⁵⁹ *ibid.*, p. 69.

⁶⁰ Lian, 1990, *op. cit.*, pp. 122-123.

⁶¹ Lian, 1990, *op. cit.*, p. 123.

⁶² *ibid.*, p. 122.

concessionaire and the logging company is such that forests are treated as a source of 'income' rather than 'capital' perpetuating the 'gold rush' attitude in logging.⁶³

Syndication is evident in cases of subcontracting operations given to individuals linked to the main contractor. Subcontractors (*Bumiputera* and *non-Bumiputera*) have to pay 'official and unofficial' fees before commencing operations, which has limited participation to the richer subcontractors,⁶⁴ and increased the costs of operations, which again has emphasised the urgency of getting the most amount of short term profits from forests. The incentives working against the long term sustainability of forests for timber is also discussed in Bevis (1995)⁶⁵ and Leigh in Hirsch and Warren (1998).

Overharvesting has occurred throughout Sarawak.⁶⁶ ITTO (1990) recommended that harvesting rates have to be reduced if sustainability⁶⁷ is to be maintained.⁶⁸ Substantial over cutting was observed in hill forests, and if harvesting continued at the prevailing rate in all hill forests (circa 13,000,000 m³ per year), ITTO reported that "all primary forests in PFE and State land assumed to be available for timber production ... including those of more than 60% slope, would have been harvested in about 11 years. At that time only cutover forests would remain."⁶⁹ This mismatch has not only resulted in a lack of concern for long term well planned harvesting measures (overharvesting, poor road construction, lack of surveys), but was also destructive to soils, streams, residual trees. This is supported by Arentz (1996), who reports that over fifty percent of forest cover is destroyed in the process of logging.⁷⁰

⁶³ *ibid.*, pp. 125-126.

⁶⁴ *ibid.*, p. 125.

⁶⁵ W.W. Bevis, *Borneo Log: The Struggle for Sarawak's Forests*. Seattle and London: University of Washington Press, pp. 199-203.

⁶⁶ ITTO, 1990, *op. cit.*, pp. 35-36.

⁶⁷ ITTO defines sustainability as the rate of timber harvesting that can be attained perpetually. Sustainable timber yield must also be "consistent with the sustainment of a prescribed mix of other forest values." See ITTO, 1990, *op. cit.*, p. 27.

⁶⁸ This is based on the assumption that trees harvested had a minimum dbh (diameter at breast height) of 45 cm (this was the minimum girth or diameter limit adopted for all permanent forests), of 785 timber species -- categorised as species 1 to 3 in the Forest Department manuals -- or 23 per cent of tree flora), and a 35 year cutting cycle with no silvicultural treatment. See *ibid.*, p. 33.

⁶⁹ *ibid.*, p. 35.

⁷⁰ According to Arentz: "Log extraction tracks are often pushed through hill sides, stream crossings are made by pushing logs and soil into streams, and 40-70 per cent of residual trees, which would form the next crop are extensively damaged. Snig tracks, roads and log dumps account for 14-20 per cent of the total forest area ... A further 30-40 per cent of the area may be traversed by bulldozers as a consequence of poor

In 1987, the security of tenure for the concessionaire was further reduced through Forests (Amendment) 6/87⁷¹ where the Sarawak Forest Department and the Minister of Resource Planning have been given wide discretionary powers to suspend licences or permits, and to transfer these rights to another party for the sake of 'public interests'.⁷² Further disincentives are therefore present for the concessionaire to manage and harvest forests from a long term perspective because there is now the possibility that benefits can be dissipated or expropriated through a sudden revocation of rights, which "gave licensees and contractors even less reason to nurture or protect uncut reserves in their allocated concession area."⁷³

- *Enforcing Rights: General Enforcement of Legislation Pertaining to Timber [Part b(iii)]*

Unenforced property rights are equivalent to poorly defined property rights, as there will be insufficient incentives for forest users to adhere to legislated rights. The following sections focus on (i) enforcement issues related to management plan regulations, and (ii) illegal shifting cultivation in logging areas. Such issues broadly cover the main aspects of timber enforcement.

There is a general consensus that staffing levels have been inadequate to meet the enforcement tasks set before the Sarawak Forest Department (Kavanagh, Rahim, and Hails, 1989; ITTO, 1990; 1994c). Only 108 out of 993 forestry staff have been allocated

pre-harvest planning and lack of co-ordination between the activities of the fellers and bulldozer operators. ... Logging companies operate on short leases (up to 25 years), with no guarantee that even these will be honoured for their duration. They are thus concerned with maximum log extraction at minimum cost for maximum profit. This has resulted in many 'grab and run' operations, where employees are paid according to their productivity (volume of wood extracted per day) and thus have little concern for reducing soil and stand damage." See F. Arentz, "Forestry and Politics in Sarawak: The Experience of the Penan", in R. Howitt, J. Connell, and P. Hirsch, editors, *Resources, Nations and Indigenous Peoples*. Melbourne: Oxford University Press, 1996, pp. 205-206.

⁷¹ Forests (Amendment) 6/87, op. cit.

⁷² This is in addition to the right granted to the state to revoke the status of PFEs in order to convert it to other uses.

⁷³ M. Leigh, "Political Economy of Logging in Sarawak" in P. Hirsch, and C. Warren, editors, *The Politics of Environment in Southeast Asia*. London and New York: Routledge, 1998, p. 100.

for 'Legal Protection and Prevention' of Sarawak's forests from illegitimate uses.⁷⁴ An idea of the magnitude of understaffing is reported in Hitam and Wong (1992) who point out that between 1980 and 1991,⁷⁵ log production had increased by about three times,⁷⁶ revenue collected by about four times,⁷⁷ but staff strength had only increased by 0.6 times.⁷⁸ The Comparative statistical ratios of staff numbers between Peninsula Malaysia and Sarawak was 4.38 (6,987/1,594), whereas the ratio of total forested area between Peninsula Malaysia and Sarawak was 0.74 (62,879/84,610). The ratio of log production between Peninsula Malaysia and Sarawak in 1989 was 0.69 (12,646/18,168) and revenue collected was 0.42 (285,203/674,900). Staff strength in Peninsula Malaysia was four times greater than that of Sarawak but in terms of forested areas, log production, and revenue collected, Sarawak exceeded Peninsula Malaysia for each of the above ratios.⁷⁹ ITTO's (1994c) evaluation of 'manpower development' in the Sarawak Forest Department, considered understaffing to be a serious institutional constraint on effective enforcement. To make matters worse, ITTO also pointed out there was anecdotal evidence "from too many and varied sources for it to be without foundation"⁸⁰ to suggest that the commitment of the field work staff was also low and "inactivity" seems to be prevalent; "at present lack of commitment is extensive enough to be the limiting factor."⁸¹ This shortage and inactivity of staff meant that many logging activities have been left unmonitored and, as a result, legislation regulating harvesting and indirectly protecting social and ecological functions could not be adequately enforced by the Forest Department. As a result, incentives to respect rights that protect the long term sustainability of timber were absent although such rights are defined in forest legislation.

⁷⁴ ITTO, 1994c, op. cit., p. 15. This proportion was more or less the same throughout the period considered in this thesis.

⁷⁵ S.A. Hitam, and S.K. Wong, "Privatisation of Forest Activities in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 130.

⁷⁶ 5.93 million m³ to 19.41 million m³

⁷⁷ RM 139.3 million to RM 617.6 million

⁷⁸ 1,038 in 1980 to 1,611 in 1991.

⁷⁹ Hitam and Wong, op. cit., p. 131.

⁸⁰ International Tropical Timber Organization (ITTO). *Pre-project Report: Manpower Development of Sarawak Forest Sector*. Ref No.: PCI(VII)/7. Prepared by the Forest Department, State Government of Sarawak, Malaysia, 1994c, p. 32.

⁸¹ *ibid.*

Enforcement of Legislation Pertaining to the Harvesting of Timber in relation to Management Plans [Part b(iii)]

Understaffing in the Forest Department has been cited as a major reason for unenforced property rights in management plans. This has been documented widely from various sources. ITTO interviews reported that loggers have been known to re-enter coupes after three years to re-harvest timber⁸² although re-entry is illegal until the next cutting cycle (twenty five years). Leaders in Kapit reported to ITTO that supervision over logging and extraction seemed to be non-existent and that trees were "extracted at the whims of the licensees concerned."⁸³ This sometimes included *engkabang* and also other 'totally protected' trees, for which fines are minimal at between RM 10 to RM 15. One logging company was reported to have re-entered the same coupe over four times, and "what happens on the ground is re-entries all round."⁸⁴ Natives in the Tinjar River in Marudi reported to the ITTO Mission that *engkabang* and *jelutong* trees (which are also protected species) have been regularly cut down by logging companies.⁸⁵ Bevis (1995) reports that the illegal felling of protected species has been encouraged by logging companies against the prescriptions in the management plan.⁸⁶ Kavanagh, Rahim, and Hails (1989) of WWF report a case where a "coupe that had been cut in 1970 and 1976 and was being cut again"⁸⁷ and point out that a "definitive review of the sustainability of Sarawakian forestry should include an assessment of enforcement."⁸⁸ Parnwell and Taylor (1996) in their survey of the Iban in the Bintulu Area also point out that there has been a "blatant transgression of forestry regulations ...".⁸⁹ Re-entries have occurred several times over the last 30-40 years⁹⁰ and, in some areas, forests have effectively been clear felled.⁹¹ Even the Sarawak Timber Association (STA), consisting of logging companies, reported that the enforcement of regulations related to management plans has been lacking as the level of

⁸² ITTO, 1990, op. cit., p. 149

⁸³ *ibid.*

⁸⁴ *ibid.*

⁸⁵ *ibid.*, p. 174.

⁸⁶ Bevis, op. cit., p. 206.

⁸⁷ Kavanagh, Rahim, and Hails, op. cit., p. 27.

⁸⁸ *ibid.*

⁸⁹ M.J.G. Parnwell, and D.M. Taylor, "Environmental Degradation, Non-Timber Forest Products and Iban Communities in Sarawak: Impact, Response and Future Prospects" in M.J.G. Parnwell, and R.L. Bryant, eds., *Environmental Change in South-East Asia: People, Politics and Sustainable Development*. London and New York: Routledge, 1996, p. 282.

⁹⁰ Legally only one entry is permitted every 25 years.

⁹¹ Parnwell and Taylor, op. cit., p. 282.

Forest Department staff had not changed in the last ten years.⁹² Through anecdotal evidence, ITTO (1994c) suggested corruption could also be another reason for the lack of enforcement, although there was no concrete evidence to prove or disprove this.⁹³ Bevis (1995) and Dauvergne (1997), however, report that corruption is quite rampant in Sarawak.⁹⁴

ITTO (1994c) estimated staff numbers available for the control and supervision of logging operations (management plans and forest engineering plans) to be equivalent to around fifty members.⁹⁵ According to the ITTO project team, this was only one-third of the minimum requirements of 149 staff estimated to be required for the control and supervision of logging operations, based on the present standards of sustainable yield.⁹⁶ The major orientation of the Forest Department has so far also been towards controlling log distribution and curbing activities associated with revenue evasion rather than with supervising harvesting activities.⁹⁷ Hence, "the resulting neglect of what actually happens during logging operations was unavoidable as things stand at present."⁹⁸ For example, the

⁹² ITTO, 1990, op. cit., pp. 65-67.

⁹³ ITTO, 1994c, op. cit., p. 48.

⁹⁴ Bevis, op. cit., pp. 206-207 and Peter Dauvergne, *Shadows in the Forest: Japan and the Politics of Timber in Southeast Asia*. Cambridge, Massachusetts: The MIT Press, 1997, Chapter Four.

⁹⁵ This estimate, cautions ITTO (1994c), must be treated with care as it is an average over all production without stratification for differences in forest types, accessibility or topography. op. cit., p. 16.

⁹⁶ ITTO (1994c) estimated that around 149 full time staff were required in the field to control and supervise logging operations based on the sustainable yield criteria. Sustainable yield is defined as maintaining the same level of output over the long term. A full time staff is assumed to work effectively for 6.5 hours per day, 4.6 days per week and for 47 weeks per year. If higher harvesting standards are set (for example, the achievement of sustainable multiple use management instead of sustainable yield alone), then the number of full time staff required is 255 full time staff members. *ibid.*, p. 21. Sustainable management involves maintaining "the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue damage to the physical and social environment." *ibid.*, p. 2.

⁹⁷ ITTO, 1994c, op. cit., p. 32. Reports from forestry newsletters seem to confirm this. There is little account of penalties imposed for offences other than the evasion of royalties and illegal logging. For example in mid 1995, four persons were charged with evasion of royalty payments under Section 85(1). ("Four Charged for Forestry Offences", *Utusan Pustaka* 6, (June 1995), p. 16). A sawmill manager was charged in the Session Court in Sibu for failing to pay royalty for 47 pieces of swamp logs under Section 58(1) of the Forest Ordinance ("Royalty Evasion", *Utusan Pustaka* 7, (July 1995), p. 26). Two logging companies were under investigation by the Sarawak Forest Department for alleged evasion of royalties amounting to RM 10 million ("Probe on Two Logging Firms for Royalty Evasions", *Utusan Pustaka* 4, (April 1995), p. 22). If convicted, offenders could be liable to a fine of RM 50,000, five years imprisonment, and ten times the value of the forest produce in respect of the offence which has been committed.

⁹⁸ ITTO, 1994c, op. cit., p. 33.

Bintulu Lumber Development (BLD) concessionaire reported to the ITTO mission in 1990 that enumeration is only undertaken on a sample basis.⁹⁹

The lack of supervision is also supported by Kavanagh, Rahim, and Hails (1989).¹⁰⁰ For inventory control prescribed in the management plan, logging operators are required to carry out 'operational level forest inventories' on a block and coupe basis before commencing harvest to establish commercial timber volumes, species present, and other operational aspects. This exercise requires '10 per cent enumeration' in hill forests and '100 per cent enumeration' in swamp forests. WWF was informed that the Forest Department only checks for 10 per cent enumeration in both types of forests due to lack of staffing. One operator surveyed indicated that he undertook 10 per cent enumeration. ITTO (1994c) reported that the Forest Department is barely able to cope with the task of sampling except in a few areas, and in places which are accessible.¹⁰¹ However, not all concessionaires contravene the management plan (Primack and Tieh, 1994).¹⁰²

In spite of the absence of supervision on the ground, the non-transferability aspect of the management plan seems to have been strictly enforced. In this respect, the identity of the right holder is strictly enforced but not forest user rights. Concessionaires were monitored by the Forest Department to ensure compliance to rules in Sections 2, 49(2) and 51A of the Forests Ordinance (Sarawak Cap. 126) 1954. In *Minister of Resource Planning & Ors. v. Keruntum Sdn. Bhd.* [1990], the Director of Forests issued a non-transferable 25 year licence to the respondent Keruntum under Section 55¹⁰³ of the Forest Ordinance. However, its licence was revoked as the controlling shares in Keruntum were subsequently illegally transferred. Another case is the *Sarawak Building Supplies Sdn. Bhd. v. Director of Forests & Ors.* [1991]. The Director of Forests revoked the licence of Sarawak Building Supplies as it had undertaken reconstitution of its shareholdings without the approval of the Director of Forests.

⁹⁹ ITTO, 1990, op. cit., p. 114.

¹⁰⁰ Kavanagh, Rahim, and Hails, op. cit., p. 31.

¹⁰¹ ITTO, 1994c, op. cit., p. 32.

¹⁰² R.B. Primack, and F. Tieh, "Long Term Timber Harvesting in Bornean Forests: The Yong Khaw Case", *Journal of Tropical Forest Science* 7, No. 2 (December 1992), p. 264.

Although supervision was lacking, incidents of penalising illegal logging have been reported. Illegal logging was quite rampant in 1987 (Sibu and Bintulu Divisions) which resulted in the Forest Department having to organise 'search-and-seize' operations (*Annual Report of the Forest Department Sarawak*, 1988). Again, the government announced that in 1994, the Forest Department had seized some RM 5 million worth of logs from suspected illegal loggers. Also, more than 20 illegal logging cases were pending in courts.¹⁰⁴ In Bintulu, Forest Department Officers together with the Police seized 146 illegally felled logs valued at RM 105,000 in two cases.¹⁰⁵ However, given the level of understaffing and also of corruption, it appears that illegal logging activities to a large extent go undetected and unpenalised.

This lack of enforcement provided leeway for contractors and sub-contractors to flout forest legislation, intended to protect forests for timber, and also to protect the social functions provided by forests for native groups, and as well as the environmental and ecological functions. As a result, timber groups have few incentives to maintain forest productivity or the non-timber functions of forests, resulting in a lack of social coordination in forest use.

Enforcing Exclusion Rights in PFEs: Illegal Shifting Cultivation

With regards to illegal shifting cultivation and unlawful occupation in PFEs, contravention of legislation pertaining to Sections 21 and 36¹⁰⁶ have been dealt with by the Forest Department, sometimes with the assistance from the Police Force. It has been impossible to fully enforce exclusion due to understaffing in the Forest Department. The lack of exclusion has meant that the full benefits of timber has not been realised by the concessionaire alone, some benefits go to outside parties. However, official records and publications provide evidence of cases of illegal shifting cultivation being penalised by the Forest Department; in some cases accompanied by evictions, and sometimes police and

¹⁰³ Section 55 of the Forests Ordinance (Sarawak Cap. 126) 1954 allows the Minister to issue licences for a period exceeding one year. In this case, the licence was issued for a period of 25 years.

¹⁰⁴ "Illegal Logging Under Control: Abg. Helmi", *Utusan Pusaka* 5, (May 1995), p. 5.

¹⁰⁵ "Small Sawmills Prime Suspects in Buying Contraband Logs", *Utusan Pusaka* 5, (May 1995), p. 8.

¹⁰⁶ Recall that Sections 21 and 36 of the Forest Ordinance prohibit certain intrusions into Forest Reserves and Protected Forests in PFEs which includes shifting cultivation.

court action. In one incident, chainsaws used by the natives were seized. In the Niah Forest Reserve, buildings were demolished, crops slashed, and chainsaws seized by Forest Officers.¹⁰⁷ However, the penalties imposed on natives have been very low. Fines have ranged from RM 10 to 50 by the court,¹⁰⁸ which is too low to deter such activities, and certainly below the official RM 1,000 stated in legislation.¹⁰⁹ As the *Annual Report of the Forest Department Sarawak, 1977* stated:

The people involved in shifting cultivation inside the Permanent Forests became increasingly more daring every year because many of them were not required to appear in courts until months after the offences were discovered and reported to the Police. Even if the offenders were finally prosecuted they would get off with a light penalty of \$10 to \$20 which was neither a deterrent effect nor a lesson on the offenders to prevent from committing the same offence again.¹¹⁰

Fines for such offences have remained the same in the 1990s (ITTO, 1990).¹¹¹

The pervasiveness of illegal shifting cultivation and the inadequacy of exclusion measures have also been reported in a Forest Department report by Marajan and Dimin (1989). Between 1969 and 1985, one million hectares of forests were 'lost' due to shifting cultivation (over 65,000 hectares per year). Eighty six out of one hundred and fifteen proposed and gazetted Permanent Forest Estates (PFEs) were affected. By comparing Landstat MSS imageries in 1985 to aerial photographs taken earlier, there was an increase in encroachment into PFEs from 91,000 hectares to 116,120 hectares.¹¹² The shortage of staff to enforce compliance was cited as one of the reasons for the prevalence of such activities.¹¹³

¹⁰⁷ *Annual Report of the Forest Department Sarawak, 1979*, pp. 67-68.

¹⁰⁸ *Annual Report of the Forest Department Sarawak, 1971*, p. 12. Such fines depend on the extent of the area damaged by shifting cultivation.

¹⁰⁹ Section 21 and 36 of the Forest Ordinance.

¹¹⁰ *Annual Report of the Forest Department Sarawak, 1977*, p. 5.

¹¹¹ ITTO, 1990, op. cit., p. 168.

¹¹² E. Marajan, and A. Dimin, "The Practice of Shifting Cultivation in Sarawak - A Menace to Forest Management and Conservation", Paper Presented at the Persidangan Perhutanan Malaysia Kesepuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989, p. 5.

¹¹³ *ibid.*, p. 11.

Tenacity may be one reason why it has been difficult to eradicate illegal shifting cultivation in PFEs. This is reported by Petch (1986) in a survey of 50 households, which were illegally planting hill *padi* within the Sabal Forest Reserve.¹¹⁴ Legal action had been taken against all offenders at one time or another.¹¹⁵ Instead of eradicating cultivation, such prosecutions have, however, generated much animosity between the local people (mostly Iban) and officers in the Forest Department. Evicted squatters live outside the reserve while continuing to cultivate *padi* within the reserve.¹¹⁶ Enforcement for evictions has also been slow.¹¹⁷

In general, the prevention of encroachment into timber areas has been extremely difficult, and this has in turn hindered the exclusive use of PFEs for timber harvesting. This has partly arisen due to the prevailing attitudes of native communities who regard shifting cultivation as an activity that can rightfully be carried out in any area. This disregard for official land legislation which forbids shifting cultivation in PFEs is also supported by interviews with natives by the ITTO (1990) mission.¹¹⁸ As Cramb remarked, "any consistent attempt to enforce the ordinance would have soon filled Sarawak's jails to overflowing and sparked a peasant revolt."¹¹⁹

4.3.2 Native Shifting Cultivation and Agriculture

All shifting cultivation areas (*temuc'a* or fallow, and non-fallow) are a legal entity recognised in the Land Code (Sarawak Cap. 81) 1958. Native customary rights can be practiced in forested areas held by the respective native group. Legislation exists in the Forests Ordinance (Sarawak Cap. 126) 1954 to protect such areas from encroachment. Monitoring and enforcement of these rights is carried out by the Sarawak Forest Department and natives themselves.

¹¹⁴ Bruce Petch, *Alternatives to Shifting Cultivation: The Sabal Agroforestry Project*. Forest Research Report SS15, Research Section, Kuching: Forest Department, April 1986, p. 20

¹¹⁵ Those who did not or could not pay the fines were given short jail terms.

¹¹⁶ Petch, 1986, op. cit., p. 9.

¹¹⁷ *ibid.*, Appendix 1 (1).

¹¹⁸ ITTO, 1990, op. cit., p. 135.

¹¹⁹ R.A. Cramb, "The Evolution of Property Rights to Land in Sarawak: An Institutional Perspective", *Review of Marketing and Agricultural Economics* 61, No. 2, (August 1993/Par. II), p. 293.

- *Defining Rights: Identifying Areas of Shifting Cultivation Via Creation of Such Areas [Part b(i)]*

Forests are recognised as providing areas for shifting cultivation in the Land Code (Sarawak Cap. 81) 1958. Property rights to native shifting cultivation areas are set out in Sections 5 and 10 of the Land Code. There are two methods of creating rights to shifting cultivation in forests. After 1958, Sections 5(1) and 10(4) of the Land Code state that shifting cultivation which is part of native customary rights can only be created in Interior Area Land if a permit has been obtained from the district officer. Although such rights can still be created after 1958, it should be noted that the authorities did not favour this activity; a directive was issued in 1984 by the government stating that, as far as possible, permits should not be issued for the purpose of creating customary rights to shifting cultivation.¹²⁰

Prior to 1958, areas of shifting cultivation could be created in Interior Area Land by various methods as per Section 5(2a)(2b)(2c)(2e) of the Land Code. These include the felling of virgin jungle and the occupation of the land thereby cleared (2a), the planting of land with fruit trees (2b), the occupation or cultivation of land (2c), and any other lawful method (2e). Until a formal title has been issued, shifting cultivation areas which have been created before and after 1958 are deemed to be State land,¹²¹ and any native occupying such areas are licensees of the Government. This, in itself, has been viewed as a violation of personal rights, as indicated by The Report of the Land Committee 1962, which reviewed the Land Code,¹²² and foresaw the possibility of 'takeover' of such rights by the state. Thus the complete value of such areas will not be taken into account by forest users because of the possibility that rights to such areas may be revoked. In terms of the analytical framework in Section 2.6, herein also lies one major problem in the definition of native shifting cultivation rights, as cultivation areas are recognised as an entity but have not been formally recorded (identified) in the Land Register. This has been one major source of conflict arising from the use of forests, chiefly when logging companies encroach on areas where such rights exist.

¹²⁰ ITTO, 1990, op. cit., p. 105.

¹²¹ State land means all land for which no document of title has been issued.

¹²² *Report of Land Committee 1962*. Kuching: Government Printers, 1963, Sections 63.

However, the Land Code has also not effectively prevented the illegal creation of shifting cultivation areas by native communities. Native Customary Land and Interior Area Land comprise over 68 per cent of unsurveyed and unadjudicated land.¹²³ This lack of definition of rights to forested areas (due to an absence of ground surveys by the Department of Land and Survey) has provided opportunities for natives to illegally create native customary rights even after 1958. This affects the valuation of forests as unsurveyed areas could be claimed as shifting cultivation areas which means that non-native forest benefits can be dissipated by native groups who carry out such activities. This has arisen because it has been difficult to ascertain exactly the time when lands have been cleared as Lian (1988) reports:

Kenyah who are aware of provisions in the land laws which can work in their favour deliberately clear large areas of land, with the intention of making it Native Customary Rights land. This is encouraged by the absence of any foolproof methods to disprove native land claims and their knowledge that politicians fear the political implications of enforcing the law strictly.¹²⁴

- *Defining Rights: Identifying Precise Rights Held for Shifting Cultivation Areas (Identity of Owners, Rights Associated with Shifting Cultivation and Penalties [Part b(ii)]*

Traditionally, rights to shifting cultivation areas have been defined and enforced by the native community itself with rights and obligations existing in native communities. Also, outside native groups are usually aware of the existence of such rights through word of mouth. Rights to shifting cultivation belong to specific families or individuals within the community with some held in common (Cramb and Wills, 1990).¹²⁵ In essence, cultivation rights are transferable within members of the same society, or even native members

¹²³ Hong, op. cit., p. 47.

¹²⁴ F. J. Lian, "The Economics and Ecology of the Production of the Tropical Rainforest Resources by Tribal Groups of Sarawak, Borneo", in J. Dargavel, K. Dixon, and N. Semple, *Changing Tropical Forests: Historical Perspectives on Today's Challenges in Asia, Australasia and Oceania (Workshop meeting, Canberra 16-18 May 1988)*. Canberra, ACT: Australian National University, Centre for Resource and Environmental Studies, 1988, p. 122.

¹²⁵ R.A. Cramb, and I.R. Wills, "The Role of Traditional Institutions in Rural Development: Community-Based Land Tenure and Government Land Policy in Sarawak, Malaysia", *World Development* 18, No. 3 (March 1990), p. 349.

outside this community, but not to individuals or groups who are non-natives except through regazettement, fines are imposed for illegal transfers.¹²⁶ Forested lands are likely to be efficiently used to the extent that they can be transferred among native individuals or groups, but transfer to non-native entities is cumbersome as this has to involve an initial revocation of native rights through a formal gazettement process.

Social coordination in allocating forests from shifting cultivation to other purposes can be time consuming if disputes in customary rights cannot be resolved in an amicable manner. The power to revoke native rights is outlined in Section 4 of the Land Code (Sarawak Cap. 81) 1958, which gives the minister the power to declare any area (including any Native Area Land or Interior Area Land) to be Mixed Zone Land, thus not only removing native cultivation rights to an area but effectively allowing non-natives to use such areas for commercial and industrial purposes. Also, Government Statutory Boards and Bodies can be legislated as 'native',¹²⁷ hence allowing such entities to also acquire native land for developmental purposes as per Section 9 of the Land Code. Section 6(5) gives power to the minister to extinguish rights in Native Communal Reserves after three months. Section 94(2) allows for the extinguishment of native customary rights by the Settlement Officer in the Land and Survey Department, subject to compensation. Disputes arising from the revocation of rights to shifting cultivation and other native customary rights can be arbitrated within three months through Section 212 of the Land Code (Section 6(4)). Natives can utilise this process to redress their grievances.¹²⁸ This will then be dealt with through the court process, which, in some cases, is known to have taken several years (*Annual Report of the Forest Department, Various Years*).¹²⁹ In a situation where native customary rights are 'in the way' of logging activities: conditions governing the 'right of

¹²⁶ A fine of RM 1,000 is imposed for such offences for non-native offenders while native offenders have to pay this fine plus a sum equivalent to the value of the land transferred (Section 8 of the Land Code).

¹²⁷ Sarawak Land Consolidation and Rehabilitation Authority No. 3 of 1976, 25th March 1976 (Operational on 1.5.1976), *The Sarawak Government Gazette Part I*, Vol. XXXI 30th March 1976, No. 1 and Land Custody and Development Authority No. 4 of 1981, 29th June 1981 (Operational on 1.9.1981), *The Sarawak Government Gazette Part I*, Vol. XXXVI 30th June 1981, No. 1 legislate SALCRA and LCDA as native respectively.

¹²⁸ An officer of the Land and Survey Department prepares and submits a brief summary of the dispute together with details of the offer made by the Government, and the estimated value of the land, or of any right and interest therein.

¹²⁹ As a safeguard, Section 15 states that any State land (in this case shifting cultivation areas) will not be alienated until all customary rights therein have been surrendered or extinguished or provision has been

way' for all reasonable purposes allows for such rights to be removed (Section 34).¹³⁰ Measures to safeguard native shifting cultivation rights do not always work in favour of natives.¹³¹ For example, although Section 5(4) provides natives with rights to arbitration as per procedures in Section 212, in reality, natives cannot challenge the decision of the Minister when such extinguishments are deemed for a public purpose (Sections 6 (5) and 46 of the Land Code). The clause 'for a public purpose' has given widespread powers to the State to revoke shifting cultivation rights.¹³² Shifting cultivation rights have therefore at best been insecure as the state has had the overriding power to revoke such rights.

The issue of unclear entitlements to compensation is a thorny issue in the revocation of native customary rights. This has been reported in various sources and was even pointed out by the Director of Sarawak's Forest Department (Chai, 1991).¹³³ Native groups prize such areas highly and the compensation offered by the state has at times been reported to be inadequate. For example, Hong reports the "high degree of arbitrariness in payment of compensation for the loss of customary rights".¹³⁴ In this instance, compensation varied from RM 78 to RM 1,792 per acre of land extinguished in the case of the building of a bazaar in Tiang Bekap.¹³⁵ Proposals have been made to the Sarawak Timber Association (STA) and the government for standardised rates but there has been no response from either.¹³⁶ Lian (1987) attributes the non-arbitrariness to a non-existent structure of compensation rates in official legislation. Hence, compensation has varied according to the bargaining ability of the native group concerned. According to Lian (1987), who studied

made for compensating the persons entitled to such rights. Individuals dissatisfied with the decision of the district officer may make an appeal to the Resident. Only one appeal is permitted.

¹³⁰ Compensation for damage to trees and other property shall be primarily assessed by mutual agreement between the parties concerned (Section 34(5)). If there is an disagreement on the amount of compensation, the matter will then be decided by the superintendent. Appeals against the decision of the superintendent can be made to the High Court within thirty days (Section 34(6)).

¹³¹ Hong, op. cit., pp. 55-57.

¹³² Section 46 of the Land Code includes developments for any business purpose, residential accommodation, public infrastructure, slum clearance, and commercial agricultural ventures, including the planning, establishment, extension, improvement or development of towns, bazaars or trading centres, which in the opinion of the Minister is beneficial to the economic or social development of the state or any part thereof or to the public generally or any class of the public.

¹³³ L. Chai, "Environmental Issues Relating to Logging and Adverse Publicity by Non-Governmental Organisations", *Sarawak Gazette* CXVIII, No. 1518 (December 1991), p. 14.

¹³⁴ Hong, op. cit., p. 56.

¹³⁵ *ibid.*, p. 57.

¹³⁶ ITTO, 1990, op. cit., p. 150.

the Kenyah in the middle and upper section of the Tinjar River¹³⁷ (Tinjar Valley), compensation has depended on the persistence of owners and their knowledge on the amount of claims to which they are entitled.¹³⁸ However, such methods of compensation, as Lian reports, are not made to all communities in Sarawak. Besides the ability and persistence of farmers to bargain, the monopoly of access routes to logging areas also played a role in determining valuation.¹³⁹ Certainly the lack of persistence has lowered the amount of compensation as illustrated by Bevis (1995) in negotiations between the Samling Timber Company and the Kenyah in Baram (Long Moh in upper Baram).¹⁴⁰ Besides land schemes to resettle native communities and to engage communities in commercial agricultural schemes have been riddled with corruption, "benefiting individuals with close links to the government."¹⁴¹ This often has resulted with an attenuation of native rights which has "served the interests of the political elite and its clients."¹⁴²

Also, disagreements due to the difficulties in clearly ascertaining informal ownership have generated disputes between native communities and the state. Revoking rights in the case of dam construction illustrates the contentious issues that have been present in making compensations for informal native rights. King and Jawan's (1992)¹⁴³ study centred on resettlement of the Iban from Batang Ai depicts this point well:

... state bodies, especially the Land and Survey Department, experienced great difficulties in determining who owns what. This is in the context of

¹³⁷ one of the main tributaries of the Baram River in the Fourth Division of Sarawak.

¹³⁸ Lian, 1987, op. cit., p. 188. In the 1970s, the rate claimed for damages was about RM 380 per hectares. In the 1980s, the rate of compensation increased to RM 890 per hectares. Lian reported that logging companies paid compensation for damaging native crops: RM 5 to 15 per coffee and rubber plant depending on economic age; and as high as RM 300 per durian tree and approximately RM 50 for other types of fruit trees. Also since the 1980s, some farmers have started to charge rents instead of one-off compensation for land damaged. This ranged from RM 500 per month for the establishment of a small timber camp and log pond, to RM 750 per month for bigger camps and log ponds. These are goodwill agreements not specified in legislation. This compares to a rate of RM 760 per hectare paid by the state for native customary rights land acquired. Lian (1987) however stated that there was no definite policy on the rates of compensation; *ibid.*, pp. 188-189.

¹³⁹ *ibid.*

¹⁴⁰ Bevis, op. cit., Chapter 12.

¹⁴¹ Cramb, 1993, op. cit., p. 295.

¹⁴² *ibid.*, p. 298.

¹⁴³ This work is based closely on an earlier piece of work by V.T. King, "Planning for Agrarian Change: Hydro-Electric Power, Resettlement and Iban Swidden Cultivators in Sarawak, East Malaysia", Occasional Paper No. 11, Sub-Series on South-East Asian Development, Centre for South-East Asian Studies, The University of Hull, 1986.

land subject to Native Customary Rights, with no written, individual titles, and sometimes no clearly demarcated boundaries between separately owned plots of land. Problems of sorting out rights to land (and some other property as well, such as fruit trees) in the reservoir and resettlement areas for the purposes of compensation, manifested themselves in disputes between individuals, between households, between longhouses and between the Iban and government. Even after levels of compensation was fixed to the apparent satisfaction of the Iban and Land and Survey Department, subsequent disputes broke out.¹⁴⁴

A compensation of approximately RM 40 million was paid to the Iban in the Batang Ai. Land in the reservoir area was compensated at RM 350 per acre; in the resettlement area where land had to be acquired to accommodate the Iban from Batang Ai,¹⁴⁵ it was RM 600 per acre.¹⁴⁶ The compensation for the loss of a longhouse apartment was RM 8,000. However, Hong (1987) reported that some Iban were not fully compensated. At least eighteen families did not receive compensation for their crops, and for homes which were considered 'temporary', and were given uncleared land.¹⁴⁷

- *Enforcement of User Rights to Shifting Cultivation [Part b(iii)]*

The monitoring and exclusion of shifting cultivation areas from encroachment have been undertaken by the various native communities themselves. Disputes between logging companies and native communities have been enforced by Forest Department Officers, the district officer, police, or by the natives themselves. Generally, disputes among the natives (intra- and inter-group) regarding conflicting cultivation rights have been settled by native leaders through *adat* (native customary law) (Cramb, 1987, 1993; Cramb and Wills, 1990; Hong, 1987). Such disputes have been less 'contentious' as *adat* served as a common link which bound behaviour, and contributed to cohesion among native groups living in close proximity in an area. Increasingly, however, such disputes are also resolved through the formal court system established during the Brooke period.¹⁴⁸ Irreconcilable claims not easily resolvable through traditional native avenues, and which could result in potential

¹⁴⁴ V.T. King, and J. Javan, "Resettlement in Sarawak", in V.T. King, and N.M. Jalil, editors, *Issues in Rural Development in Malaysia*. Kuala Lumpur: Dewan Bahasa dan Pustaka, 1992, p. 159.

¹⁴⁵ This was land acquired from Iban who were made to surrender their land in order for the state to relocate Iban from Batang Ai into the resettlement area.

¹⁴⁶ *ibid.*, p. 160.

¹⁴⁷ Hong, *op. cit.*, p. 174.

conflicts and disorders have been increasingly settled through the formal court system.¹⁴⁹ A survey of available court cases indicates that such disputes have been common.¹⁵⁰

Encroachment into legal shifting cultivation areas by logging companies has been more contentious. Kavanagh, Rahim, and Hails (1989) of WWF note that in management plans, logging companies have to take into account of areas where native customary rights exist and are required to reach agreements with local communities with respect to the use of such areas (roads, log ponds, etc.). However, they report that the attitude of logging companies towards native customary rights has generally been unsympathetic:

If the operators that we interviewed were typical, loggers regard such rights as an unavoidable imposition on their operations and one with which they have no sympathy. This does not, however, alter the fact that they have to take full account of them.¹⁵¹

Hong (1987) points out that numerous native grievances against timber companies have occurred in the Baram District of Sarawak's Fourth Division¹⁵² and the Belaga District in the Seventh Division, areas which make up more than seventy percent of Sarawak's forested areas. In these areas, encroachments are common, and enforcement (in terms of compensation paid to affected parties) has not always been forthcoming.¹⁵³ In one instance, a logging company damaged farmland belonging to the Long Bunau community in the

¹⁴⁸ Cramb and Wills, *op. cit.*, p. 350.

¹⁴⁹ *ibid.*, p. 351.

¹⁵⁰ There are many documented cases of native conflicts. In *Udin Anak Lampon v. Tuai Rumah Urom* [1949], rights to customary land was extinguished when the appellant (Udin Anak Lampon) moved to another area. In *Mentu Tapu & Ors. v. Lobang Batu & Anor.* [1952], the court ruled in favour of the respondents as evidence presented by the appellants' witnesses tended to be contrived, and inconsistent. *Sumbang Anak Sekam v. Engkarong Anak Ajah* [1957] dealt with the case of land transferability and communal rights. In *T.R. Nast Anak Chapai v. T.R. Mandai Anak Genging* [1961], the court ruled that the unplanted parts of land still belonged to the creator of those rights as it is classified as *temuda* (secondary forests) land. In *Galau & Ors. v. Penghulu Imang & Ors.* [1967], the court determined that administrative boundary had no relevance to the creation and holding of *temuda* rights. In *Nyalong Anak Bungan v. The Superintendent of Lands & Surveys, 2nd Division, Simanggang* [1967] MLJ, the court ruled that the non-occupation and non-use of land for over 20 years meant that rights to this land had been abandoned by the claimant. In *Yabak Anak Yaba (f) v. Bangis Anak Barnit* [1968], documentary evidence supplied by the Lands & Survey Department was used to settle this dispute in favour of Bangis. In *Injing v. Tuah & Anor.* [1970], the court ruled in line with Dayak Customary Law in the Third Division whereby the owner of land forfeited all rights and interests when he emigrates elsewhere.

¹⁵¹ Kavanagh, Rahim, and Hails, *op. cit.*, p. 37.

¹⁵² The Baram River, where logging began in 1970s, is the second largest river in Sarawak and is fed by three main tributaries: the Tinjar, the Apoh, and Tutoh Rivers.

¹⁵³ Hong, *op. cit.*, p. 90.

Patah River. When residents demanded compensation, they were ignored by the logging company; also their appeals to the state went unheeded.¹⁵⁴

Accounts of native grievances on encroachments by logging companies are also reported in ITTO (1990). Natives were prepared to permit entry into their fallow shifting cultivation areas (*temuda*) if compensation is paid but this was often not forthcoming.¹⁵⁵ In Belaga, natives were not opposed to logging but to uncompensated logging encroachments into their *temuda*.¹⁵⁶ Natives pointed out that blockading will continue if restraint is not practiced and compensation not meted out.¹⁵⁷ Accounts of timber companies disrespecting shifting cultivation areas have also been reported by natives in Limbang.¹⁵⁸

4.3.3 Edible and Non-Edible Forest Products: Wildlife, Fruit, Vegetables, Sago, Timber, Rattan, Palm, Medicines

Communal Forests (CFs) are the third sub-category of PFEs. Such forests are constituted to meet the needs of specific native communities, of their timber and non-timber needs. CFs are maintained by the community itself in a condition of sustained yield and under the direction of the Forest Department (Section 46).

- Defining Rights: Identifying Edible and Non-Edible Forest Products via the Constitution of Communal Forests [Part b(i)]

The Forest Ordinance and Land Code provide for the establishment of areas of CFs. CFs are created from any State land Forest which is not a Forest Reserve, Protected Forest or any other type of Government Reserve or alienated land. The procedures for constitution of CFs follow that of PFEs. Section 48 in the Forests Ordinance (Sarawak Cap. 126) 1954,

¹⁵⁴ *ibid.*, pp. 90-91. Other examples cited in Hong include the following. A Baram native reported that logging companies had intruded into native *temuda* and when compensation was demanded the community was asked to produce a land title to the area. *ibid.*, p. 98. In another incident, *padi* was destroyed because the logging company drove the tractor across the farm to get to the logs. No compensation was offered. *ibid.*, p. 109.

¹⁵⁵ ITTO, 1990, *op. cit.*, p. 150.

¹⁵⁶ *ibid.*

¹⁵⁷ *ibid.*

¹⁵⁸ *ibid.*, p. 170.

however, gives the Minister the power to revoke the status of CFs,¹⁵⁹ creating again an insecure entity which is ill-defined with the possibility that such benefits could be dissipated.

There is one crucial point to note in terms of the definition of property rights involving native customary rights. In native customary law, natives recognise both *temuda* and *menoa* as rightfully belonging to them.¹⁶⁰ Traditionally native customary rights have included primary jungles (*menoa*) but this is no longer recognised in current Sarawakian ordinances although allowances have been made in special cases for pre-existing rights to continue in National Parks. The legal recognition of *temuda* by the State and not *menoa* (land which includes water that runs through it and primary jungles to the extent of half a day's journey which contains many edible and non-edible forest products)¹⁶¹ is critical for all Dayak and has been a source of contention between native communities and the state. Chala studying development and change in Sarawak, supports this contention:

This differentiation is critical for all Dayaks with recognised claims to customary land, as it is not the legitimacy of customary land itself which is disputed, but the area it covers.¹⁶²

This is also supported by ITTO (1990):

Determination of hunting rights, etc., in forest land which had not been cleared or otherwise claimed under Native Customary Right (e.g., 'menoa' land) are more complicated and potentially contentious ...

The Mission therefore concludes that many of the present complaints and claims of right by local communities are not based on Sarawak law as

¹⁵⁹ This is detailed in Sections 40 to 45 of the Forests Ordinance (Sarawak Cap. 126) 1954. Section 48 gives power to the Minister, by notification in the Gazette, to revoke the status of a Communal Forest.

¹⁶⁰ A case defending *menoa* rights of natives can be found in *Jok Jau Evong & Ors v Marabong Lumber Sdn Bhd & Ors* (1990). Natives maintained that the said area contained *temuda* and *menoa* rights and, as such, was wrongfully removed from them. Although this was brought to court and tried, the natives in this instance lost their case because of the technicality of failing to challenge this proclamation (gazettement) within a specified time limit of three years (made in 1957). The appellants have made an appeal in the Supreme Court.

¹⁶¹ A.J.N. Richards, *Sarawak: Land Law and Adat*. Kuching, Sarawak: Government Printing Office, 1961, p. 24.

¹⁶² T. Chala, *Development and Change in Sarawak: An Analysis of a Conflict*. Unpublished Master of Arts Thesis (Geography Department), University of Melbourne, June 1993, p. 102.

established by the Land Code, but on a continued application of older, traditional native custom.¹⁶³

As such, there are no incentives by other forest groups to consider the value of *menoa*. Drawing from b(i) of the analytical framework in Section 2.6, this incomplete definition excluding *menoa* has resulted in conflicts in forest use reported by Chala and ITTO above.

- *Defining Rights: Identifying Precise Rights Held in CFs (User Rights, Users and Penalties)[Part b(ii)]*

User rights in edible and non-edible forest products can exist in CFs, National Parks, and Protected Forests in PFEs. However, only an incomplete range of edible and non-edible forest products are protected in the latter two categories.

In CFs and National Parks, forest products can be removed by a specific native community for personal use, but not for sale, exchange, or direct profit (Section 47 of the Forests Ordinance (Sarawak Cap. 126) 1954). Exclusion clauses also apply. Members outside a particular community are not allowed to remove any forest produce from the said area (Section 47(2)). The penalty for the unlawful cutting, collection, or removal of any forest produce from communal forests is detailed in Section 80 of the Forest Ordinance.¹⁶⁴ Penalties appear sufficient to deter contraventions by non-natives if such areas are monitored with penalties duly administered. The lack of enforcement however negates and nullifies this, although native communities' self policing mechanism seems adequate in ensuring inter-native group compliance (Cramb and Wills, 1990; Cramb, 1993).

Protected Forests, the second sub-category of PFEs, although allowing commercial logging also provides rights for natives to collect timber and non-timber produce for personal use, and to hunt (Sections 37 and 65 of the Forest Ordinance). In Protected Forests, any native community can remove forest produce for personal use. Section 57 however prohibits the felling of certain classes of timber for the purposes of conversion

¹⁶³ ITTO, 1990, op. cit., p. 37.

¹⁶⁴ Imprisonment for three months and a fine of RM 500 or ten times the value of the forest produce in respect of which the offence has been committed; whichever is greater. In 1979, this was subsequently increased to an imprisonment term of one year and a fine of RM 2,000 or ten times the value of the forest produce; whichever is greater.

into charcoal or firewood. Native cultivated areas and certain native trees (*engkabang* which yields *illipe nuts*) located in Protected Forests belongs exclusively to the native group itself. However, not all forest products considered important by natives are defined and protected in legislation, for example, rattan and sago. Again, this affects social coordination as products valued by native groups are not considered by loggers in such areas.

The Wild Life Protection Ordinance (Sarawak Cap. 128) 1958 and 1990 and National Parks Ordinance (Sarawak Cap. 127) 1956 contain provisions for the co-existence of native rights of product collection and hunting, if such rights have existed before the gazettelement of the Wild Life Sanctuary or National Park (ITTO, 1990).¹⁶⁵ Section 2(c) of National Parks Ordinance (Sarawak Cap. 127) 1956 allows the Resident to specify any rights admitted or privileges conceded within a National Park in the process of proclaiming an area as a National Park. Examples include the Mulu National Park and the Batang Ai National Park.¹⁶⁶ Wildlife is protected for conservation purposes, but generally not for native subsistence.

Importantly, edible and non-edible forest products located in forested areas outside CFs, are not specifically protected in the management plans, and has been the grounds for conflicts in Sarawak.¹⁶⁷ For example, products like rattan, *damar*,¹⁶⁸ bamboo, and sago palm are some of the unprotected forest products which have been destroyed in the process of logging. Anecdotal evidence provided by Hong (1987) points to the widespread destruction of such products in Baram and Belaga areas.¹⁶⁹ In addition, although hunting and the collection of forest products are permitted in Protected Forests (forty four per cent

¹⁶⁵ Section 9(2)(c) allows the Governor in Council to specify any private or community rights or privileges that can exist in respect of or in connection with the Wild Life Sanctuary. In 1990, the amended Wild Life Protection Ordinance, 1990, again allowed for the existence of private or community rights or privileges in respect of or in connection with the Wild Life Sanctuary (Section 11(2)(c)) by specification of the *Yang di-Pertua Negeri* (Governor). This includes hunting, collecting plants and also cultivation in native area and, native customary land or interior area land (Section 26).

¹⁶⁶ As Meredith states for the Batang Ai National Park: "The inhabitants of seven longhouses near the Park have wide privileges to hunt, fish, gather jungle produce and take timber in the Park. All land subject to Native Customary Rights is excluded from the Park, even where it lies inside the boundary." in M.E. Meredith, "A Faunal Survey of Batang Ai National Park, Sarawak, Malaysia", *The Sarawak Museum Journal* XLVIII, No. 69 (New Series) (December 1995), p. 133.

¹⁶⁷ Forest Reserves, Protected Forests, and State land Forests form 98 per cent of Sarawak's forested areas.

¹⁶⁸ Resin used as fuel.

of forests) and State land Forests (forty five per cent of forests), the availability of products in logged areas has often been markedly reduced (ITTO, 1990). This has also been supported by Caldecott (1986).¹⁷⁰

The incomplete protection of edible and non-edible forest products due to inadequate definitions in legislation is documented in ITTO (1990), which points to widespread complaints by native groups on the impact of logging on their livelihood. The lack of definition of native rights has led to an absence of incentives for loggers to consider native concerns about forest products. This has resulted in numerous complaints and objections, throughout Sarawak,¹⁷¹ about the impact of logging on rattan and game supplies, and on water turbidity and flows destroying aquatic life (fish), and also pollution in waterways and water sources (ITTO, 1990). Kapit District leaders reported that special areas set aside to preserve rattan (*pulau*) in primary jungles were destroyed by loggers.¹⁷² Although the right existed for natives in Kapit to remove timber from forests (Protected Forests), this right could not be exercised as all good timbers were already logged.¹⁷³ The Kelabit in Limbang reported that logging has reduced sources of fish. In addition, logging activities has also led to the disappearance of fruit trees and animals. Rattans have also been destroyed in the process.¹⁷⁴ Blockades organised in response to logging encroachments have resulted in native arrests. Native groups in Kapit reported that larger logs suitable for home and boat building have already been removed by loggers.¹⁷⁵ *Ipoh* trees (*Antiaris toxicaria*), which provide poison for Penan darts, are costly to replace, and as such should be protected.¹⁷⁶ ITTO discussions with the community leaders and general public in Marudi also revealed similar problems.¹⁷⁷ Again, in spite of legislation which recognises the right for native communities to collect and hunt edible and non-edible products from forests, there are problems for communities like the Penan who simply cannot move to

¹⁶⁹ Hong, op. cit., chapter 7.

¹⁷⁰ J. Caldecott, *Hunting and Wildlife Management in Sarawak: Final Report of a Conservation Management Study for Hunted Wildlife in Sarawak*. Kuala Lumpur: World Wildlife Fund Malaysia, May 1986, pp. 99-101.

¹⁷¹ These discussions are presented in detail in Appendix II of ITTO (1990).

¹⁷² *ibid.*, p. 148.

¹⁷³ *ibid.*

¹⁷⁴ *ibid.*, p. 165.

¹⁷⁵ *ibid.*, p. 150.

¹⁷⁶ *ibid.*, p. 170.

¹⁷⁷ *ibid.*, p. 174.

another part of the forest when their area is logged, because their use of forests depend on a precise knowledge of the location of resources.¹⁷⁸

Due to the non-existence of defined and legally recognised rights for some edible and non-edible forest products, not only is social coordination incomplete but it makes enforcement of rights impossible as they have not been defined in the first place. With the advent of logging operations, it has been impossible for natives to impose their customary laws on an external interest group, constrained only by the management plan and the Land Code which does not completely recognise and protect wild or uncultivated forest products necessary for native subsistence. Again, the thorny issue of *menoa*,¹⁷⁹ in this instance, applies. Areas containing wildlife, rattan and other valuable wild forest products are not recognised as a legal entity in the Land Code or Forests Ordinance and hence are sometimes ruined by loggers.

As a result, widespread blockades have occurred in the Baram, Belaga, and Limbang Districts in 1987.¹⁸⁰ In 1987, in response to the blockades organised by native communities throughout Sarawak, the state issued amendments to the Forest Ordinance to limit the rights of natives to organise blockades (Section 90(B) in The Forests (Amendment) 6/87).¹⁸¹ This amendment in turn was perceived by natives to be a ruling against their rights (Cleary and Eaton, 1992). The legal position of blockades was now sealed and native groups, especially the Penan, have perceived this to be "robbing them of the most effective means of protecting their land."¹⁸²

¹⁷⁸ Kavanagh, Rahim, and Hails, 1989, p. 39.

¹⁷⁹ Menoa is land that includes primary jungles (uncultivated) to the extent of half a day's journey. In the Land Code (Sarawak Cap. 81) 1958, such land is deemed to belong to the state which runs contra to traditional native customary law.

¹⁸⁰ *The Battle for Sarawak's Forests*, op. cit., pp. 10-14.

¹⁸¹ As a result, any individual who erects or sets up or causes to be laid, erected or set up any structure, stone, log, tree or any other article on any road constructed or maintained by the holder of a licence or permit issued under this Ordinance so as to cause a barrier or obstruction to the passage of that road is guilty of an offence. In addition, any individual who wilfully prevents, obstructs or molests any forest officer or police officer in the execution of his/her duties or the holder of a licence or permit or his/her employee or agent from removing the barrier or obstruction or in the exercise of his rights within the area covered by the licence or permit; shall also be guilty of an offence. The penalty: imprisonment of two years and a fine of RM 6,000 and, in the case of a continuing offence, a further fine of RM 50 in respect of every day during which the offence continues.

¹⁸² Cleary and Eaton, op. cit., p. 187.

Although procedures are in place for the establishment of CFs, the constitution of such areas in practice has not been enforced by the state. Communal Forests comprised only 49.42 sq km of forests in 1995¹⁸³ whereas Protected Forests comprised 36,587 sq km of forests (Annual Report of the Forest Department, Sarawak, 1995). Areas of forests allocated for Communal Forests are minimal or non-existent in areas where heavy logging has been taking place. The Sarawak Study Group (1992), examining applications for Communal Forests in the Belaga District, reported that only one out of thirty applications has been approved.¹⁸⁴ The group also revealed that the attitude of government officers has generally been negative: it was felt that applications for Communal Forests were generally not genuine, that applications were filed to disrupt timber operations and indirectly to demand compensation from timber operators.¹⁸⁵ In another instance, the Chief Police Officer of the Seventh Division was reported to have stressed that no application for communal forests should be investigated, that all applications should be turned down so that logging operations will not be held up.¹⁸⁶

The lack of enforcement of timber management plans had also created grounds for conflicts. ITTO pointed out that native communities have not been against logging per se but the speed and manner in which logging has destroyed forest products necessary for their subsistence:

... strong complaints of invasion of 'temuda' (i.e., former land claimed under NCR), violation of cemeteries, damage to domestic water supplies, to watercourses and consequently to fish stocks, depletion of game, the disturbance of paths through the forests, ... felling of fruit trees and of protected tree species of commercial value, such as engkabang ...¹⁸⁷

¹⁸³ The breakdown is as follows: 9.77 sq km in the Kuching Division, 1.023 sq km in the Sri Aman Division, 4.98 sq km in the Sibul Division, 7.95 sq km in the Sarikei Division, 7.28 sq km in the Kapit Division, 3.24 sq km in the Bintulu Division, 5.97 sq km in the Samarahan Division, and none in the Miri and Limbang Divisions.

¹⁸⁴ Sarawak Study Group, *Logging in Sarawak: The Belaga Experience*. Malaysia: INSAN, the Institute of Social Analysis, 1992, p. 13.

¹⁸⁵ *ibid.*, p. 14.

¹⁸⁶ *ibid.*, p. 15. SAM also reported that out of the eighteen applications for Communal Forest in the Limbang and Baram areas, none has been approved. See *The Battle for Sarawak's Forests*, op. cit., p. 210.

The management plan also specifies that compensation should be made for damages to certain native products in PFEs and SFs (Kavanagh, Rahim, and Hails, 1989). However, such payments have not always been the norm. Lian (1987) points out that annual payments of up to RM 80,000 have been made to whole Kenyah communities. However, Lian also reports that compensation has, in reality, depended on the ability of the native communities to persist in demanding for such payments. Some native communities have also been 'tricked' into signing away their rights without realising the full implications of such agreements.¹⁸⁸ For example, SAM reports that the Kelabit in Long Seridan, Baram, were made to sign an agreement in 1986¹⁸⁹ for themselves and the Penan in their areas which, in effect, allowed the timber company to transverse native customary areas without any hindrance, and to construct build and maintain bridges over and across streams and rivers.^{190 191} Natives also report the use of pressure in making them sign agreements.¹⁹²

Again, although natives can collect timber from licensed areas in Protected Forests (where logging operations occur), in practice, ITTO (1990) reported that unlogged timber suitable for native subsistence is often very scarce in such areas. Furthermore, the Director of Forests has pointed out that timber operators in Sarawak often discourage such practices by natives.¹⁹³ In practice, native access to the collection of forest products in such forests are contingent on the goodwill of individual logging companies as reported in Cooke (1997).¹⁹⁴

4.3.4 Human Abode and Native Graveyards

Human abode, and native burial grounds and shrines form part of Native Customary Lands where native customary rights can be exercised. Property rights (native customary rights) to Native Customary Land in respect to abode and burial grounds is given recognition

¹⁸⁷ ITTO, 1990, op. cit., p. 36

¹⁸⁸ *The Battle for Sarawak's Forests*, op. cit., pp. 206-207.

¹⁸⁹ This agreement is detailed in *ibid.*, p. 230-236.

¹⁹⁰ *ibid.*, p. 231. The goodwill payment was RM 10,000 per year. In addition, compensation of RM 8 per chain in length and two chains in width was also agreed upon and RM 25 was offered for fruit trees damaged and RM 5 for trees of certain specifications and age. *ibid.*, p. 233.

¹⁹¹

¹⁹² *Jok Jau Evong & Ors v Marabong Lumber Sdn Bhd & Ors* [1990], p. 431.

¹⁹³ Chai, op. cit., p. 14.

¹⁹⁴ F.M. Cooke, "The Politics of "Sustainability" in Sarawak", *Journal of Contemporary Asia* 27, No. 2 (1997), p. 224.

under Sections 2 and 5 in the Land Code 1958 (Sarawak Cap. 81). Section 5 specifically recognises the use of forest lands for 'abode' and 'burial grounds and shrines' to be part of native customary rights and, as such, these areas constitute a legal entity (although these areas may or may not have been formally recorded in the Land Register as yet).

- *Defining Rights: Identifying and Measuring Human Abode and Native Burial Grounds and Via Constitution [Part b(i)]*

This right can be acquired by natives, and is recognised in the Land Code, when an area of forest land is cleared for such purposes prior to 1 January 1958 [Section 5 (2)(d) of Land Code (Sarawak Cap. 81) 1958]. After 1 January 1958, abodes and burial grounds and shrines can be created in Interior Area Land¹⁹⁵ if a permit has been obtained from the district officer for such activities (Section 10). Alternatively, the State can grant at any time a communal reserve area for the exercise of native customary rights which includes native burial grounds and human abode (Section 6 of Land Code).

- *Defining Rights: Identifying Precise Rights Held for Human Abode and Native Burial Grounds (User Rights, Users, and Penalties)[Part b(ii)]*

Once this right has been established, and provided it has not been extinguished by the minister, any native group or individual native will hold exclusive rights to the said area for the purpose of occupation, burials and religious worship. Rights in these areas normally take the form of communal rights, not formally titled but vested in the group of natives concerned. Penalties to exclude such areas, however, do not seem to be enough of a deterrent for logging companies; the costs of violating native graveyards are much less than benefits derived from harvesting timber. For example, any deliberate and illegal intrusion into or destruction of native burial grounds (unlawful occupation) would result in a fine of RM 500 for the first offence, and a jail term of three months and fine of RM 500 for second and subsequent offences.¹⁹⁶

¹⁹⁵ Interior Area Land is one of the five categories of land in Sarawak. Much of this land is in the interior of Sarawak, and is under primary forest. Under the Land Code, such areas granted to natives for the exercise of native customary rights will be redesignated as "Native Customary Land".

¹⁹⁶ Profits are estimated to be around RM 21,000 per hectare of forested area.

Section 8 states that natives cannot transfer land under native customary tenure (Native Area Land, Native Customary Land, and Interior Area Land) to non-natives. Transferability is limited as is the case of all areas where native customary rights exist. Except through a process of gazettement by the government, rights cannot freely move to the party that values it the highest, if that party is non-native.

Security of tenure to abode and native burial grounds and shrines is incomplete. Although rights to abode, burial grounds and shrines are defined and recognised in the Land Code, there are many clauses in legislation that allow for the extinguishment of such rights. Native customary rights can be extinguished by discretion of the Minister similar to that of the revocation of rights to shifting cultivation discussed in Section 4.3.2. In addition, Native Customary Land acquired prior to 1 January 1958, and also interior area land acquired for such purposes are considered as State land (Section 5 of the Land Code). State land is land for which no document of title has been issued, and rights to such land can be forfeited or surrendered to or resumed by the government. Natives occupying such land are considered licensees of the government.

Native Communal Reserve Areas granted by the state (where native burial grounds and abode are located) also continue to be State land, and natives who have acquired rights in these areas are again licensees of the Government. Areas may cease to be part of a Native Communal Reserve if the minister feels that it is no longer required as such. Discussions in the previous two sections apply here. Compensation has not been well defined (there is no standard or officially stated compensation rate) or fully enforced, and areas containing such rights have sometimes been revoked with much disputations as discussed in earlier sections.

Native customary rights to abode and burial grounds could also be extinguished through the Forest Ordinance. Procedures for such extinguishment have been discussed in Section 4.3.1. Again, Section 3 of the National Parks Ordinance 1956 (Sarawak Cap. 127) lays down the power of the Governor in Council to constitute National Parks, which also provides the possibility that areas of native customary land including native burial grounds and shrines can be extinguished. The procedure to address grievances from this

constitution is similar to that of sections 8, 15, and 16 of the Forest Ordinance. Given the insecurity in tenure, and unclear compensation rates when areas containing native customary rights are revoked, the concerns of natives for burial grounds and shrines are not fully signalled in social coordination, leaving inadequate incentives by other forest groups to consider the significance of this function to native communities.

Enforcement of Abode Native Burial Grounds and Shrines[Part b(iii)]

Details on the enforcement of native rights to human abodes was discussed in Section 4.3.2 involving the relocation of native communities from Batang Ai. Suffice to note, enforcement in terms of compensation was contentious in that some natives have not received compensation for the destruction of their longhouses. On the whole, general information on enforcement is scant but it can be said that it is impossible for such edifices to be accidentally overlooked by loggers and that natives themselves would have strong incentives to defend their own areas of abode.

In the case of burial grounds and shrines, the monitoring and identification of offenders would be carried out by the natives themselves. As a high value is attached to this function, natives have strong incentives to monitor areas designated for burial grounds and shrines. Also such areas could be identified by outsiders by ironwood burial posts or crude boundary markings by natives. In both cases, the state would only intervene and enforce legislation to this function when a complaint is brought before them.

There is an account of court intervention to protect this function. In *Hii Tiong Yew v. Buduol Anak Laju & Others* [1962],¹⁹⁷ Section 5 of the Land Ordinance was cited, and Hii was ordered to stop felling trees in the area as it was a cemetery used by three longhouses (proof of ownership of native burial grounds was established previously by the Sibul District Court). Although Hii had obtained formal title to the said area, the High Court pointed out that the native customary rights to the cemetery were never extinguished in the first place. The Registrar (Lands and Survey Department) was ordered to rectify the mistake made (Section 136 of the Land Code) in offering the area of land to Hii as the said

¹⁹⁷ Appeal against decision made previously in the Sibul District Court.

land was still held under native customary rights (burial grounds). The court also supported the natives in the exercise of a legal right recognised by law and the natives were awarded compensation of \$50.00 and allowed to dispute this amount offered if they desired to do so.

However, there are numerous accounts of infringements of this right and of non-enforcement by the authorities. The natives of Long Layun in the Apoh River have had their cemeteries desecrated by a logging company.¹⁹⁸ Hong (1987) cites another incident in Ulu Belaga where the burial grounds of the Kenyah were desecrated by a timber company in 1982.¹⁹⁹ Requests for compensation (monetary and emblems for sacrifice to appease ancestors) were not met. Requests by natives for written support from the district officer to substantiate informal land claims of the natives was not provided. Another incident involving the destruction of graveyards occurred in Ulu Balui in 1983.²⁰⁰ ITTO (1990) also reports similar incidents: community leaders in Kapit have reported that trees around cemetery areas have been illegally cut down. The lack of official staff to enforce such regulations was identified as the main cause.²⁰¹ The Penan in Limbang also pointed out that their graveyards have been bulldozed by logging companies.²⁰² Penan graves in the Baram and Tutoh area were also desecrated by loggers.²⁰³

Such incidents suggest that rights were not always enforced in relation to native burial grounds. This situation was exacerbated when hill logging operations increased significantly in the 1980s impacting on native customary rights in general and resulting in massive timber blockades in 1987.

4.3.5 Biodiversity: Preserving Plant and Animal Species

The importance of preserving plant and animal biodiversity has been provided for in the National Parks Ordinance and the Wild Life Protection Ordinance. A Board of Trustees was formed to administer National Parks in 1956. In 1973, the Conservator of Forests

¹⁹⁸ Hong, *op. cit.*, p. 90.

¹⁹⁹ *ibid.*, pp. 105-107.

²⁰⁰ *ibid.*, p. 109.

²⁰¹ ITTO, 1990, *op. cit.*, p. 150.

²⁰² *ibid.*, p. 166.

²⁰³ *ibid.*, p. 174.

(now Director of Forests) replaced the Board of Trustees. The Forest Department is now in charge of enforcing the National Parks Ordinance of which the National Parks and Wild Life Office in this Department assumes complete responsibility.

- *Defining Rights: Identifying Biodiversity Via Constitution of NP and Wild Life Sanctuaries [Part b(ii)]*

The constitution of Totally Protected Areas (TPAs) is mainly undertaken by the National Parks and Wildlife Office in the Sarawak Forest Department and is similar to the constitution of Permanent Forest Estates. The constitution of forests for a National Park is similar to the constitution of PFEs, and is through notification in the Gazette by the Resident as per section 4 of the National Parks Ordinance. There are clauses ensuring compensation for the revocation of prior informal native rights, detailed in sections 5 and 7 of the National Parks Ordinance.

Identification of biodiversity areas was extended in 1990 to include wider geophysical aspects or categories of natural areas.²⁰⁴ The concept of Totally Protected and Protected Animals was also introduced in 1990 Amendment. Also in 1990, amendments were introduced in which the National Parks Ordinance included the protection of smaller areas termed as Nature Reserves.²⁰⁵ These cover small pockets of forests that could contain important sources of biodiversity.²⁰⁶

In 1993, the Sarawak Government legislated to provide ownership and control of rights to pharmaceutical or medical research to the Director of Forests in the Sarawak Forest Department (Section 65A(1) of the Forest Ordinance). This arose because of the discovery of the *bintangor* tree which has the potential for inhibiting the AIDS virus. Upon

²⁰⁴ In this respect, the 1990 Amendment to National Parks Ordinance (Sarawak Cap. 127) 1956 redefined National Parks to include areas (including any marine, estuarine or freshwater areas) providing suitable and conducive for the preservation of the State's general wild life; preserving flora, fauna or geological or physiographical features of special interest in an area; providing, under suitable conditions and control, special opportunities for the study of and research into matters relating to the fauna and flora of the State and the physical conditions in which they live, and for the study of geological and physiographical features of special interest; or affording opportunities for public enjoyment of the natural scenic beauty of the park as far as is consistent with the objectives of the park.

²⁰⁵ National Parks (Amendment), *The Sarawak Government Gazette Part I*, Vol XLV, No. 1 31 May 1990.

²⁰⁶ Nature Reserves are like National Parks in every respect except it is of a much smaller scale (less than 1,000 hectares in size).

discovery, an order was issued preventing the felling of this species.²⁰⁷ This in effect provided a mechanism to signal the pharmaceutical or medicinal values of forest species to the Forest Department which could then sell the right to any interested group, provided it could exclude others. However, difficulties involved in valuing biodiversity (thin markets) and also that of excluding non-right holders may not allow accurate value of such rights to be determined.

Another method of defining rights for biodiversity is through the establishment of Wild Life Sanctuaries (including any marine, estuarine or freshwater areas newly defined in the 1990 update). Wild Life Sanctuaries can be established through the procedures detailed in The Wild Life Protection Ordinance (Sarawak Cap. 128) 1958, updated in 1990.²⁰⁸ Section 20 of the Wild Life Protection Ordinance 1990 provides additional powers to the Minister to conserve wild life, or geological or physiographical features of any area of land, including privately owned land.²⁰⁹ This includes compensation to land owners for the revocation of their rights.²¹⁰

- *Defining Rights: Identifying Precise Rights Held for Biodiversity (User Rights, Users, and Penalties) [Part b(ii)]*

In terms of biodiversity, it is the duty of the Sarawak Forest Department²¹¹ to take steps to ensure the protection of animal and vegetable (subsequently plant) life in a National Park, and the preservation of such areas and the animal and vegetable life in a natural state (Section 9(2)(b)). The Director of Forests also has powers to introduce new regulations for National Parks. Portions of National Parks may also be reserved or set aside as breeding

²⁰⁷ The Forest Ordinance, The Calophyllum Species (Prohibition of Felling and Restriction of Export) Order, 1993.

²⁰⁸ Procedures for constitution are similar to that of National Parks. In the 1958 legislation, a Wild Life Sanctuary could co-exist with a Forest Reserve or Protected Forest thus not really allowing for complete protection due to the conflicting nature of logging and wild life preservation. Since 1990, this has been amended and the constitution of a Wild Life Sanctuary now means the revocation of the status of a Forest Reserve or Protected Forest. Wild Life Protection Ordinance (No. 2 of 1990). *The Sarawak Government Gazette Part I*. Vol XLV, No. 1 31 May 1990.

²⁰⁹ Appropriate measures adopted to protect wild animals and wild plants include ensuring sufficient habitat for survival, stopping the hunting, killing, capturing any animal or destroying, cutting, collecting, uprooting or removing any wild plant, forest produce, trophy, soil, rock, peat, clay, minerals or any geological substrata.

²¹⁰ Detailed in Section 20 of the Wild Life Protection Ordinance.

places and as nurseries for vegetation. National Parks are protected from encroachment (exclusion rights) in Section 14 of the National Parks Ordinance while Section 11 states that there shall be a Park Warden for each National Park. This ensures that benefits from such areas can be controlled by the Sarawak Forest Department, an important prerequisite for coordination between timber, biodiversity, and other forest functions. In terms of exclusion, there are penalties for encroachment in Section 14, where visitors can also be excluded from certain parts of a National Park to protect certain animal and plant species. Previously, penalties were low relative to monetary benefits that could be derived from the sale of protected species. In 1990, many penalties have been increased above the value of the species of wild life to afford greater protection to endangered species.²¹² There are many sections in legislation to provide for the exclusion of forested areas for the protection of plant and animal diversity, which is one important prerequisite for social coordination.

In the case of a Wild Life Sanctuary, the conservation of biodiversity has been defined to include exclusion. Prohibitions and penalties are similar to those contained in the National Parks Ordinance,²¹³ but the prevalent lack of enforcement scenario applies, with the revocation of rights by the Minister also possible.²¹⁴ Also, the continued existence of this forest function is not secure, since both National Parks and Wild Life Sanctuaries can be degazetted and their status revoked. Section 19 of the Wild Life Protection Ordinance allows the *Yang di-Pertua Negeri* (Governor) to revoke the status of a Wild Life Sanctuary while the Land Code gives power to the Minister to degazette a National Park. Such

²¹¹ This role was later transferred to the Conservator of Forests in 1973 and to the Director of Forests in 1990)

²¹² For example, penalties were increased to RM 50,000 and imprisonment of five years for capturing, killing or impounding a rhinoceros compared to RM 500 previously (Section 15 D introduced in 1990).

²¹³ Total prohibition on hunting, killing, and capturing any animal; cutting and removing any vegetables (plants); or any inanimate matter; erecting any building, or clearing or breaking up any land for cultivation or for any other purpose; kindling, keeping or carrying any fire or leaving any fire burning (Section 14 of the Wild Life Protection Ordinance (Sarawak Cap. 128) 1958).

²¹⁴ In the 1960s, the penalty for hunting killing, or capturing a rhinoceros brought about an imprisonment of two years and a fine of RM 5,000. This was subsequently increased to RM 20,000 in 1986. For other mammals, birds, fish, and reptiles, the penalty is an imprisonment of one year and a fine of RM 2,000. For contravening legislation pertaining to other categories of acts stated above (including the destruction of plants), the penalty is an imprisonment for six months and a fine of RM 1,000 (Section 14). In 1990, new penalties were introduced all round (Sections 4, 15, and 21 of the Wild Life Protection Ordinance (Sarawak Cap. 128) 1958). For totally protected animals, penalties are similar to Section 15D of the National Parks Ordinance discussed earlier. In terms of totally protected plants, penalties are again similar to that of Section 15D.

insecurity means that benefits of protecting such areas may be dissipated through revocation. This may happen when the construction of the Bakun Dam re-commences as certain cables would have to pass through the Batang Ai National Park. In fact, WWF Malaysia has always pointed to the necessity for areas of biodiversity to be given more security than is currently afforded and the Sarawak government appears to be heeding to that concern (Mok, Jalil, and Jiwan, 1991).

It is important to note that there is also a potential for conflict, based on the manner in which some native rights can co-exist in National Parks (Section 7(2)(c) of the National Parks Ordinance and Section 11(2)(c) of the Wild Life Protection Ordinance). Hunting and collecting rights of specific communities who have been residing in the area prior to the constitution of the National Park or Wild Life Sanctuary is, in many instances, allowed to continue. Allowing such rights to continue has meant that there is also a possibility that a growing native population, requiring new areas for subsistence needs, may overexploit forest resources in the area, unintentionally destroying its surrounding ecology. In addition, licences are granted for hunting, killing, capturing protected animals, selling any protected animal or any trophy or flesh thereof, and exporting any animal stated in the First Schedule of the Wild Life Protection Ordinance (sections 17, 18, 19 of the Wild Life Protection Ordinance and in Section 25 of the Wild Life Protection Ordinance (Sarawak Cap. 128) 1990). Licences have been issued as Bennett (1989) reports, and charges for these licences have been minimal. RM 10 for a hunting licence for per head of protected animal, RM 100 to deal/sell each head of protected animal or plants (Fifth Schedule of the Wild Life Protection Ordinance). Such low charges do not encourage conservation. In the early 1990s, over 60,000 guns were legally registered in the state, with almost two million cartridges imported each year.²¹⁵

- *Enforcing Rights: Protection of Biodiversity [Part b(iii)]*

Enforcing rights to biodiversity would involve constituting TPAs for the preservation of biodiversity, conducting research into biodiversity so that conservation can be carried out

effectively, protecting (monitoring, excluding, and penalising unlawful acts and entry) Totally Protected Areas (TPAs) from encroachment, and implementing ownership rights for pharmaceutical products. ITTO (1994c) reported that the present level of staffing of National Parks and Wild Life Sanctuaries to carry out such duties is inadequate. It identified three forms of understaffing in the Forest Department. These were insufficient numbers of staff, insufficient training in park management, and insufficient specialists in wild life research.²¹⁶

Morshidi and Gumal (1995) of the Sarawak Forest Department pointed out that the idea of TPAs began in the 1950s.²¹⁷ Almost all flora and fauna listed as 'Totally Protected' and 'Protected' are found inside existing or proposed TPAs,²¹⁸ provided all proposed TPAs proceed to the final stage of constitution. The Forest Department has been actively constituting TPAs for biodiversity preservation. However, the pace of constitution has been slow, only very limited areas have actually been gazetted to conserve plant and animal diversity. This is reported by ITTO who considered Sarawak's conservation strategy to be inadequate as not all proposed areas have been gazetted. During ITTO's mission in 1990, only 2.04 per cent of Sarawak's land has been classified as 'Totally Protected Area', comprising National Parks,²¹⁹ wild life sanctuaries, and nature reserves.²²⁰ Gazetting proposed areas would bring this total to 8.33 per cent of Sarawak's land area (1,038,469 hectares). ITTO points to the long delays in gazetting of proposed areas as a serious problem hindering the protection of biodiversity.²²¹

In terms of identifying species, the current state of knowledge about most species and ecosystems is inadequate; the only detailed research has been carried out on the proboscis

²¹⁵ J. Caldecott, "Hunting Patterns and their Significance in Sarawak" in Ghazally Ismail, Mertedza Mohamed, and Siraj Omar, *Forest Biology and Conservation in Borneo*. Borneo: Centre for Borneo Studies, Publication No. 2, Yayasan Sabah, 1992, p. 248.

²¹⁶ ITTO, 1994c, op. cit., p. 50.

²¹⁷ A.H.K. Morshidi, and M.T. Gumal, "The Role of Totally Protected Areas in Preserving Biological Diversity in Sarawak", in R.B. Primack and T.E. Lovejoy, editors, *Ecology, Conservation, and Management of Southeast Asian Rainforests*. New Haven and London: Yale University Press, 1995, p. 205.

²¹⁸ *ibid.*, p. 207.

²¹⁹ This was increased to 3.3 per cent in the early 1990s. They also provide the following data: nine national parks cover 113,955 hectares and three wild life sanctuaries cover 174,851.4 hectares. See Morshidi and Gumal, op. cit., p. 204.

²²⁰ ITTO, 1990, op. cit., p. 49.

²²¹ *ibid.*, pp. 49-50.

monkey, while short surveys have been undertaken on the *orang utan*, clouded leopards, Sumatran rhinoceroses, terns, migrant birds, and swiftlets.²²² Botanical studies are equally limited; there is much information about Sarawak's timber trees but information on native wild plants except for palms and orchids is scarce.²²³ ITTO (1990) pointed out that there needs to be more research into biodiversity by the Forest Department:

Forest management aimed at conservation and the maintenance of biological diversity needs the support of a well designed programme of research and monitoring, including research plots having protected area status. Particularly important for the effective management of WSs [wild life sanctuaries] is research into the biology of the most important species that they are designed to protect.

However, the level of research power in the Forest Department on silvicultural and forestry-related topics is not matched by a parallel capacity in the wildlife/animal side.²²⁴

The Forest Department has recognised that it does not have sufficient data for detailed management of wild life, stemming from the lack of trained personnel and staff in the field.²²⁵ This problem has been partly eased by the research effort of international organisations like the WWF.

Enforcement of exclusion from parks and sanctuaries has not been completely effective. Shifting cultivation has occurred in National Parks; in the late 1980s, Marajan and Dimin (1989) of the Sarawak Forest Department identified shifting cultivation in the following National Parks and Wild Life Sanctuaries: Gunong Gading NP, Niah NP, Lambir NP, Similajau NP and the Lanjak-Entimau NP.²²⁶ ITTO noted that more rigorous prevention of illegal incursions had to be accompanied by improved opportunities for farming outside the NPs, and supported by better public relations.²²⁷ Illegal hunting had occurred in the 1970s because natives were unaware of the provisions of the Wild Life Protection Ordinance and of the accompanying penalties.²²⁸ At the time, it was pointed out that

²²² *ibid.*, p. 209.

²²³ *ibid.*

²²⁴ ITTO, 1990, *op. cit.*, pp. 53-54.

²²⁵ Morshidi and Gumal, *op. cit.*, p. 209.

²²⁶ Marajan and Dimin, *op. cit.*, p. 20.

²²⁷ ITTO, 1990, *op. cit.*, p. 51.

²²⁸ *Annual Report of the Forest Department Sarawak, 1975*, p. 19.

insufficient staff had made the enforcement impossible.²²⁹ The lack of enforcement has continued into the 1990s because of understaffing (ITTO, 1990).

The interview by the ITTO Mission with the Deputy Director of National Parks and Wildlife Sanctuaries in Sarawak revealed that only 100 staff were involved in managing Sarawak's National Parks and Wildlife Sanctuaries in 1990; it was stressed that this level had to be increased to more than 600 staff to adequately cope with the management of NPs and WSs. The Deputy Director of National Parks also reported that there was illegal poaching in the Samunsam Wildlife Sanctuary. Furthermore, it was pointed out that these poachers were armed and have no respect for the patrols. In the Gading National Park in Lundu, serious encroachments into Gunong Gading has occurred as there were insufficient staff to prevent such encroachments (especially shifting cultivation); there was only one National Park forester in charge of the whole park of 4196 hectares. Shifting cultivators who have been caught were not allowed to harvest their rice and their chainsaws are confiscated. However, the fine imposed has been minimal and has not been sufficient to act as a deterrent.²³⁰

The new clauses introduced to establish ownership rights to pharmaceutical and medicinal research have been implemented by the state. An agreement was signed between the State Government and the National Cancer Institute (NCI) of America which provided a 'substantial' but undisclosed amount to the Sarawak Forest Department for the right by NCI to conduct AIDS research based on the *Bintangor* tree (*Calophyllum Lanigerum*). In addition, NCI also agreed not to licence this drug to any company unless these companies enter into an agreement that will pay the Sarawak Government a certain amount of royalty for the use of the drug.²³¹ Currently, the development of the drug has proceeded to a stage where pre-clinical trials have been initiated.²³² In addition, the State Government has also signed a five-year agreement with an Australian pharmaceutical firm, AMRAD Corporation Limited, which provides for collaboration in the "collection, research and

²²⁹ *ibid.*, pp. 51-52.

²³⁰ WWF, *Conservation Strategy...*, *op. cit.*, p. 135.

²³¹ "Royalty Payment for Anti-Aids Drugs from Bintangor Trees", *Perkasa* 12, No. 3 (September 1994), p. 3.

investigation of plant samples and the implementation of a joint research programme".²³³ The agreement provides for the payment of royalties to Sarawak should a product or products be developed from compounds extracted from these samples.²³⁴

4.3.6 Regulation of Water Flows and Soil Erosion

The function of forests in preventing soil erosion and providing hydrological services (water catchment)²³⁵ is recognised in the Forest Policy 1954 and overseen by the Sarawak Forest Department. However, until the 1980s, only section 20 of the Forests Ordinance (Sarawak Cap. 126) 1954 specifically recognised that areas of forests need to be preserved and set aside exclusively for water catchments and other uses excluded. There were no regulations to control soil erosion until the introduction of forest engineering plans in 1983.

- *Defining Rights: Identifying Water Flows and Soil Erosion Functions [Part b(i)]*

Prior to 1983, there were no detailed restrictions on timber harvesting based on environmental and ecological considerations. As such, incentives for loggers to consider the environmental impact of their actions were absent, as pointed out by a Sarawakian forest officer:

The logging operators showed little concern for the need to reduce soil erosion and stream sedimentation and did not appreciate that a good and healthy residual stand would be necessary to ensure the continuity of harvesting operations in the next cutting cycle. Tree fellers just cut down

²³² H.S. Lee, "The Forest Resources of Sarawak -- A Base for Bioprospecting", in Ghazally Ismail, editor, *Bioresource Utilization: The Biotechnology Option for Malaysia*. Malaysia: Pelanduk Publications, 1997, p. 130.

²³³ *ibid.*.

²³⁴ *ibid.*, p. 131.

²³⁵ Forests provide a "sponge effect" which means they absorb rainfall, and then slowly release it back into rivers and streams. As such, consistent supplies of water are ensured when forested areas are left standing, especially when such areas enclose streams and rivers. This process has also been termed catchment management. There is also a close link between catchment management and the prevention of soil erosion. Forests, when left standing, prevent run-off and soil erosion. Therefore areas of forests which enclose rivers and streams should be preserved for the function of catchment protection, regulation of water flows, and prevention of soil erosion.

the merchantable trees in a haphazard manner and tractor drivers simply bulldoze their way through the forest to skid the logs to the landing.²³⁶

Since 1983, a forest engineering plan together with a management plan apply to each hill forest concession in PFEs (Chua, 1986). This was in line with the need to improve the environmental standards and quality of harvesting in hill forests.²³⁷ The implementation of the forest engineering plan was to rectify haphazard road networks in concessions which have caused soil erosion, stream sedimentation, and unnecessary destruction of residual stands of forests.²³⁸

The role of forests in preserving areas for water catchments was unrecognised in legislation until 1990. Kavanagh, Rahim, and Hails (1989) of WWF pointed out that there has been "no exercise to identify crucial catchments on a macro scale, to get these catchments recognised officially, or to manage them first and foremost as catchments."²³⁹ In Sarawak, totally protected areas are only gazetted when they can be justified as Wildlife Sanctuaries and National Parks; this criteria has tended to limit the ability of the Forest Department to allocate forests for protective functions unrelated to plant and animal conservation. This was rectified in 1990 in an amendment of the National Parks Ordinance in 1990.²⁴⁰ The definition of 'National Parks' was extended to incorporate any area of land to include marine, estuarine, or freshwater areas (Section 3 of 1990 Amendment). Also, the purposes of a National Park now not only included the preservation of flora and fauna but also the geological and physiographical features of special interest in an area thus allowing the waterways to be protected. Small areas termed 'Nature Reserves' could also be established to perform water catchment functions. In this sense, there is recognition that forests perform a water catchment function.

The change in legislation in 1990 has led to a recognition of the need to conserve forested areas (TPAs) for water catchment. As pointed out by Morshidi and Gumal (1995):

²³⁶ D.K.H. Chua, "Forest Engineering - Its Role in the Management of the Mixed Dipterocarp Forest of Sarawak", Paper Presented at the Persidangan Perhutanan Malaysia Kesembilan (Ninth Malaysian Forestry Conference), Kuching, Sarawak, 13-20 Oktober 1986, p. 2.

²³⁷ *ibid.*, p. 1.

²³⁸ *ibid.*, p.3.

²³⁹ Kavanagh, Rahim, and Hails, *op. cit.*, p. 9.

... TPAs also protect other vital resources, such as water catchments. Services provided by TPAs may have no immediate monetary value, but they are of tremendous importance to local and regional populations. Streams in Lambir Hills National Park and Kubah National Park, for example, supply about 38 million liters [*sic.*] of water daily to Miri and Kuching, respectively.²⁴¹

TPAs are now increasingly recognised for their watershed functions. The Batang Ai, Gunung Gading, Kubah, Lambir Hills, Loagan Bunut National Parks have been identified as important watershed areas. In addition, proposed National Parks like the Hose Mountain, Pulong Tau, Santubong, Tanjung Datu and Usun Apau National Parks are in the process of being constituted in part due to watershed functions.²⁴²

The identification of the water catchment function of forests is more exact in the Natural Resources Ordinance (Sarawak Cap. 84), 1949, which was updated to the Natural Resources and Environment (Amendment) Ordinance (Sarawak Cap. 84) 1994.²⁴³ However, there is one limitation: EIAs are only required in extraction or felling of timber from any area exceeding 500 hectares which have previously been logged or closed by the Director of Forests.

- *Defining Rights: Identifying Precise Rights to Prevent Soil Erosion and to Protect the Water Catchment Function of Forests [Part b(ii)]*

The forest engineering plan requires both a General Harvesting Plan (GP) and Detailed Harvesting Plan (DP)²⁴⁴ and serves the purpose of protecting the ecological and environmental functions of forests (soil erosion and watersheds) by specifying standards by which the coupe layout, road network, location of campsites, and access roads should

²⁴⁰ National Parks (Amendment), No. 3 of 1990, *The Sarawak Government Gazette Part I*, Vol XLV, No. 1, 31 May 1990.

²⁴¹ Morshidi and Gumal, *op. cit.*, p. 207.

²⁴² *ibid.*, pp. 214-217.

²⁴³ The amended Natural Resources and Environment Ordinance (Sarawak Cap 84), effective 1 February 1994, was formerly known as the Natural Resources Ordinance (Sarawak Cap. 84) 1949. Previously, very general in its focus, and largely inoperational throughout most of its existence, this legislation has been given an overhaul in 1993 and now contains regulations governing among many matters, a consideration of the impacts of timber harvesting procedures on the physical, social and geographical surroundings.

adhere to. Appendix 4.3 provides details of this plan. During the period under study, no direct penalties exist for the violation of the forest engineering plans in the Forests Ordinance (Sarawak Cap. 126) 1954. There is only one minor section in Section 96 where the Director of Forests can include any matter in which he is empowered in this Ordinance to regulate; this, in itself, can be applicable to the forest engineering plan. The penalty is a prison term of six months and a fine of RM 1,000. With effect from 1994, the prison term was increased to 5 years and a fine of RM 25,000; again the marginal benefits of violating this piece of legislation far exceeds the costs given scant enforcement in forests.²⁴⁵

The 1994 Amendment to the Natural Resources Ordinance (Sarawak Cap. 84), 1949 gives the Natural Resources Board the power to order the preservation and protection of the source, course and banks of streams; and the protection and control of water, and the sources of supply of water required for human consumption including inland waters (Section 10(2)(f)(g)); in effect governing user rights to forested areas. The 1994 Amendment also gave power to the present Natural Resources and Environment Board to determine and take measures or to instruct any other person or body to prevent, abate, and stop the pollution of waters in rivers or those in catchment areas; and to control, stop or prohibit the destruction of vegetation for the prevention of erosion, damage or injury to the natural resources, rivers and landscapes or the protection of inland waters of the State (Section 5(c)(d)). Section 5(c)(d) in turn has resulted in *Guidelines for Preliminary Environmental Impact Assessment (EIA) for Forest Harvesting, 1995* which specifically directs those involved in forest harvesting to take into account the impact of logging on rivers and streams thus compelling these groups to minimise environmental destruction on these areas and of directly recognising the role of forests in performing the water catchment function (hydrology and water quality). Penalties exist for non-compliance. Failure to carry out such an order will result in the board carrying out or completing any works which are necessary to give effect to such an order and the amount or cost will be a debt due by such owner or occupier which until discharged will also incur an interest rate

²⁴⁴ "Sequence of Forest Harvesting Operations Based on the Selective Felling System" (Appendix 6) in *Guidelines for Preliminary Environmental Impact Assessment (EIA) for Forest Harvesting*. Sarawak: Natural Resources and Environment Board, 27 January 1995.

²⁴⁵ Profit figures are around RM 21,000 per hectare/per harvest. See Chapter Five of this thesis.

of three per cent per year (Section 10(4)(5)). However, this rule is only applicable for ELAs.

- *Enforcement of Legislation Pertaining to Soil Erosion and Water Catchment [Part b(iii)]*

In general, there has been little or no enforcement of forest engineering plans let alone any systematic monitoring or study of the impact of logging on soil erosion in the 1980s (Butt, 1983; Butt and Petch, 1985; Petch, 1985).²⁴⁶ Furthermore, the lack of staffing in the Forest Department has prevented any systematic monitoring of soil erosion and also of enforcement of measures to protect erosion-prone soils during logging.²⁴⁷ There is one study by WWF which provides insights into the impact of logging in mixed dipterocarp forests (MDFs) (WWF, 1985).²⁴⁸ According to the report, logging removed as few as seven trees per hectares. (33 m³ per hectares); however, there was much incidental damage to other trees in the vicinity.²⁴⁹ Logging (selective harvesting) of hill forests also necessitated the clearance of about 12 per cent of the total area for roads, landings, and trails.²⁵⁰ Furthermore, the extraction process left an average of 34 per cent of forested areas open. Thus hill forest logging in Sarawak removed about 46 per cent of the natural cover.²⁵¹ Damage is done to the top soil surface and is attributed to extraction involving skid trails, tracking by heavy plant, stockpiles, loading paths, and lorry roads. WWF also pointed out that although the forest engineering plan comprehensively covers the planning of roads and logging operations, it did not include guidelines or regulations for the siting and planning of log ponds, nor the protection of riverbanks.²⁵²

Forest engineering plans were incompletely enforced. The lack of enforcement has meant that the forest engineering plan has had little impact on preventing soil erosion and regulating water flows in forests. ITTO (1990) in its assessment of the implementation

²⁴⁶ See, for example, B. Petch, "The Nature and Rate of Soil Erosion in Sarawak Forests: A Review" (Forest Soils Technical Note 4/85), Soils Research Unit, Research Section, Forest Department, Kuching, Sarawak, Malaysia, November 1985.

²⁴⁷ G. Butt, and B. Petch, *Erosion Risk Mapping in Logging Areas: Ulu Niah (Pilot Project)*. Forest Research Report S.S. 14, Soils Research Unit, Kuching, Sarawak: Forest Department, August 1985, p. 21.

²⁴⁸ Also supported by personal observation while travelling throughout Sarawak.

²⁴⁹ WWF, *Conservation Strategy Sarawak* ..., pp. 86-87.

²⁵⁰ *ibid.*, p. 87.

²⁵¹ *ibid.*

reported that standards have not been observed by most logging operators. This lack of adherence was due to understaffing in the Forest Department.²⁵³ ITTO reported that the main concern of road building is guided by the need to efficiently transport logs and not by environmental or ecological concerns. "Environmental considerations do not appear to enter into the prescriptions for design, except in so far as they enhance efficiency."²⁵⁴ Serious accelerated erosion and soil deterioration was observed in recently logged hill forests, attributed to "the operation of machinery -- in building roads, in opening and using skidding trails and in excessive cutting into the surface soil while preparing the surroundings of a tree for felling or skidding."²⁵⁵ Away from these machine intensive areas, the "forest soil appears to suffer little from erosion."²⁵⁶

Further accounts of incomplete enforcement were reported in terms of accelerated erosion in areas. The main sources of such erosion were identified to a lack of compliance to the forest engineering plan by the ITTO mission. In particular, the "extraction (and therefore road construction) being conducted in topography from which it is, in theory, excluded; insufficient attention to excluding logging from small areas which are too steep; inadequate control of protection of reserves along stream banks; insufficient attention to the erosion caused by road, culvert and bridge design and construction, the location, opening and closing of skid trails and the general operation and closing of machines on the ground; ... neglect of roads and skid trails after extraction is completed."²⁵⁷ Gross siltation and contamination of fresh waters has been evident in all visits to hill forests. The environmental costs of logging in the steeper hill forests using present methods have been unmistakable: damage to upper stream courses and turbid waters was immediately evident.²⁵⁸ The problem of erosion was not an isolated incident as river siltation was observed in all of ITTO's visits to concessions in the steeper parts of hill dipterocarp

²⁵² *ibid.*, pp. 87-88.

²⁵³ ITTO, 1990, *op. cit.* p. 41 and 66.

²⁵⁴ *ibid.*, p. 41.

²⁵⁵ *ibid.*.

²⁵⁶ *ibid.*.

²⁵⁷ *ibid.*, p. 42.

²⁵⁸ *ibid.*, p. 43.

forests.²⁵⁹ In one example, the ITTO mission had the opportunity to contrast the silted main watercourse with an unlogged part of the catchment where the water was clear.²⁶⁰

Evidence for the lack of enforcement for the forest engineering plan can also be found in Kavanagh, Rahim, and Hails (1989). The authors report that the actual inspection of roads by the Sarawak Forest Department is seldom undertaken by the engineers in the department: there are only two engineers in the whole forest department qualified to undertake inspections.²⁶¹ This has allowed for "great variations in road standards". The WWF team was left with the impression that "road building is greatly dependent on how the operator tackles what to him is a purely practical problem and this is in turn dependent on the technical resources that he has available."²⁶²

ITTO discussions with the various native communities also confirmed the lack of compliance with the forest engineering plan.²⁶³ Complaints were made to the Chief Minister and the State Assembly but no action had been taken.²⁶⁴ The river bank erosion at Belaga was so severe, and siltation at the Rajang so serious, that at low water express boats could not get through without hitting the shallows.²⁶⁵ In addition, the waters of the Baram River were chocolate coloured and totally unfit for consumption and washing.²⁶⁶

The destruction of the environmental and catchment functions of forests by present logging methods in Sarawakian hill forests is succinctly summarised by ITTO:

As logging is conducted at present in steep terrain, there is without question a very considerable environmental cost. Damage to the upper stream courses and turbid waters are immediately evident and may be partly the cause of depleted fish stocks and contaminated water supplies about which

²⁵⁹ *ibid.*, p. 43.

²⁶⁰ *ibid.*

²⁶¹ Kavanagh, Rahim, and Hails, *op. cit.*, p. 28. This situation seems to have remained the same in the 1990s (excluding the Assistant Director who was also an engineer). See *Annual Report of the Forest Department Sarawak, 1993*, p. 292

²⁶² Kavanagh, Rahim, and Hails, *op. cit.*, p. 28.

²⁶³ Natives in the Kapit District pointed out that bulldozing in Belaga in particular has caused river siltation. See ITTO, 1990, *op. cit.*, p. 152. Natives in Baram have also pointed out that by 1978, the rivers had become muddy because of logging and land could not be planted because of landslides. See *ibid.*, p. 177.

²⁶⁴ *ibid.*, p. 177.

²⁶⁵ *ibid.*, p. 150.

²⁶⁶ *ibid.*, p. 173. This is also confirmed by personal observation while travelling through this river in 1994.

there are many complaints from longhouse dwellers; serious and lasting damage is likely to arise in the future, as the bed-load moves downstream, sandbanks interfere with river navigation, seasonal flooding increase and river mouths and ports become silted. The immediate costs fall mainly on the local communities; in the longer term downstream consequences will affect the entire state.²⁶⁷

ITTO suggested that either better supervision and stricter enforcement of standards with better training of operatives be effected, or an exclusion of vulnerable areas of forests from harvesting as the environmental costs were too high.²⁶⁸

The fears expressed by ITTO materialised when the Natural Resources and Environment Board in Sarawak admitted that "excessive logging had caused serious sedimentation and havoc to river systems."²⁶⁹ In the Balui River alone, which will act as the water catchment for the proposed Bakun Dam, studies conducted by the Bakun Dam consultant revealed that 63.5 million tonnes of soil were annually poured into this river because of logging.²⁷⁰ The Natural Resources and Environment Board also stated that annually up to 60 million tonnes of sediment were found in other major river systems in Sarawak; this attributed to the building of timber roads and skid trails.²⁷¹ The requirement that an EIA be performed for forest harvesting to prevent soil erosion has been enforced in one instance where an EIA has been conducted at the proposed site of the Bakun Dam.²⁷²

4.3.7 Recreation and Tourism

The recreation and tourism function is a subset of the creation of National Parks, and of National Parks and the new category of Nature Reserves (smaller forested areas performing similar roles to that of National Parks) in the 1990s. As such, the major ordinance that governs the recreation and tourism function of forests is the National Parks

²⁶⁷ ITTO, 1990, op. cit., p. 43.

²⁶⁸ *ibid.*, p. 44.

²⁶⁹ "'Stern Action' Ordered Against Overlogging", *The Straits Times*, 5 July 1996, p. 40.

²⁷⁰ "Sarawak Rivers Hit by Logging", *The New Straits Times*, 4 July 1996, p. 1

²⁷¹ *ibid.*

²⁷² In terms of biomass, there are approximately 50 million m³ of biomass in the reservoir consisting of 1 million m³ of export quality sawlog, 10 million m³ of smaller sawlog and large chipwood, 12 million m³ of small chipwood, and 27 million m³ of unmerchantable biomass. EKRAN, *Privatisation of the Bakun Hydroelectric Project: Detailed Environmental Impact Assessment for Reservoir Preparation*. Sarawak, Malaysia: Ekran Berhad, February 1995, p. EX-2.

Ordinance (Sarawak Cap. 127) 1956, which is enforced by the National Parks and Wild Life Office in the Sarawak Forest Department.

- *Defining Rights: Identifying the Recreation and Tourism Function Via Constitution of National Parks and Nature Reserves [Part b(i)]*

Property rights have been defined to include the identification of the recreation and tourism role in forests. Section 9 (2d) of the National Parks Ordinance (Sarawak Cap. 127) 1956 states that the Conservator (now Director of Forests) may within a National Park or Nature Reserves provide accommodation, amenities, facilities and services as are likely to attract visitors and are not prejudicial to the proper care, control, and management thereof of the National Park or Nature Reserve.

- *Defining Rights: Identifying Precise Rights Held for Recreation and Tourism (Identity of Owners, User Rights Associated with Recreation and Tourism and Penalties [Part b(ii)]*

Since 1990, the functions of National Parks have been redefined to include "affording opportunities for public enjoyment of the natural scenic beauty as far as is consistent with the objectives of the park." (Section 3(b) of the Amended National Park Ordinance). Nature Reserves have been defined as areas "facilitating public appreciation of such natural features or sites as far as is consistent with the objectives of the reserve." (Section 3(a) of the Amended National Park Ordinance). The Director of Forests (previously Conservator) with the approval of the Minister, can make regulations for visitors to enter National Parks, periods or times in which a National Park or Nature Reserve is opened to the public; the fees to be paid for permission to enter or reside in a National Park or Nature Reserve, for the admission of motor cars and other vehicles and for the taking of photographs within a National Park, or for any other purpose connected with the use of and enjoyment of a National Park or Nature Reserve. As such, the definition of rights to such areas in effect provides the signalling of value and incentives for other groups to consider the recreation and tourism aspect of forests, this depending on the structure of rewards or penalties for the violation of rights. The structure of penalties for the violation of rights has been discussed in Section 4.3.5 of this chapter.

- *Enforcing Rights: General Enforcement of Legislation Pertaining to the Management of Recreation and Tourism [Part b(iii)]*

Discussion of the enforcement of rights in relation to biodiversity in National Parks in Section 4.3.5 would be applicable to the recreation and tourism component here. Hence the discussion in this section will be brief. Understaffing in the Sarawak Forest Department would also imply that abuses in these public areas cannot be monitored closely and legislation is not enforced effectively as in the case of National Parks. Incentives for users to observe regulations may therefore be incomplete.

Information on the value of this function however can be easily signalled as fees are charged for entry into such areas, and also earnings from accommodation and catering outlets signal benefits from the recreation and tourism functions of forests. In terms of enforcing what has been defined as facilities to support recreational areas, in 1993, seven out of the nine constituted National Parks had visitor accommodation facilities -- Bako, Niah, Lambir Hills, Mulu, Kubah, Gunung Gading and Similajau National Parks (Annual Report of the Forest Department Sarawak, 1993). The National Parks and Wild Life Office of the Forest Department has over the decades also been actively building support facilities like chalets, hostels, jungle tracks, plankwalks, observatory hideouts or towers, information centres and staff quarters in the various National Parks. (Annual Report of the Forest Department Sarawak, various years). In addition, visitor levels are also monitored by the Forest Department (Bujang and Sandi, 1992), although there is no evidence of prosecution on tourists who have caused damage to plant and animal material in TPAs.

The value of ecotourism has certainly been acknowledged by the Sarawak Forest Department. As Bujang and Sandi (1992) state:

There has been a noticeable linkages between forest conservation and ecotourism in the State especially so in the establishment of national parks. The increased inflow of tourists has been parallel to the increase in the number of constituted national parks. Reciprocally, the encouraging upward trend of tourist inflow to the state has also brought greater appreciation of the economic potentials of nature conservation in general and forest conservation in particular. Currently, there is an upheaval of interest both

on the part of the government and private entrepreneurs to invest in ecotourism related development.²⁷³

4.4 Discussion and Conclusion

In this chapter, conflicts arising from the use of forests in Sarawak have been examined following part b of the analytical framework, outlined in Section 2.6 of Chapter Two. The focus was on the definition and enforcement of property rights for the various forest functions in Sarawak. The general insecurity of property rights for the various forest functions, inconsistent rates of compensation for the revocation of rights, an incomplete definition of property rights for native edible and non-edible products including the thorny issue of *menoa*, the permission to hunt and gather in TPAs, and, importantly, the level of understaffing in the Sarawak Forest Department are some of the more important factors that have hindered social coordination.

In Sarawak, forest functions have not always been defined in a secure and clear manner to provide incentives for users to consider the concerns of others, or for forest values to be signalled to all groups interested in forests. For example, factors like leases for harvesting timber not being timed according to the natural regeneration cycle of forests, and the granting of concessions and its renewal being based on political connections, have skewed timber operations towards that of maximising output above other concerns. This has resulted in an overharvesting of timber, with negative repercussions experienced by a cross section of non-timber interest groups.

As a result, strong complaints have been voiced, with blockades by native groups throughout Sarawak in reaction to these impacts. Conservation and environmental groups have also expressed serious misgivings on the impact of logging on soils and the ecology, pointing to how the manner in which timber rights have been defined has destroyed many non-timber forest functions.

The manner in which processes of definition have created conflicts is also demonstrated in the manner in which native rights could be revoked without an officially set and consistent

²⁷³ A.W.B. Bujang, and S. Sandi, "Forest Conservation and Eco-Tourism in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July-2 August 1992, p. 220.

rate of compensation. Although disputes have been arbitrated, compensation has often been perceived to be unfair. Revocation procedures have been a major source of dispute between native communities and the state, especially in instances when such rights have had to make way for logging operations or for the construction of dams.

Native customary rights in shifting cultivation, edible and non-edible forest products, and native abodes and graveyards have been insecure at best. This arising because such rights, although recognised by the state, have yet to be formally identified and recorded in the Land Register. In addition, many native edible and non-edible products are not protected in legislation, and this has given rise to animosity when such products have been destroyed in the process of logging. Importantly, the non-recognition of *menoa*, which is considered as an entity in traditional native customary law, in the Land Code has been another source of contention. Native grievances against encroachments into their fallow shifting cultivation areas and the lack of enforcement by the Forest Department in enforcing exclusion has been another source of conflict. The lack of supervision by the Forest Department in enforcing exclusion to native burial grounds has also caused conflicts between natives and logging companies. Applications for native communal forests have also not been approved, thus legislation providing for native communal needs in forested areas has, in effect, not been enforced.

The manner in which rights have been defined has affected the role of forests in conserving ecology in National Parks and Wild life Sanctuaries. Allowing hunting and collecting rights for native groups to continue (if such rights have previously been in existence prior to the gazettement of the area) have created the potential for conflicts against the very conservation goals that such areas have been established to promote. Other aspects in the definition of rights that affect social coordination include the non recognition of the water catchment function of forests until 1990, when water catchment was recognised as an important aspect of conservation in National Parks and Wild life Sanctuaries. In terms of ecological conservation, illegal shifting cultivation has been occurring in National Parks as the exclusion of such areas could not be enforced due to understaffing. In the Gunong Gading National Park, serious encroachments have occurred

because of insufficient staff to monitor these areas, and in the Lanjak-Entimau Sanctuary, illegal poaching has also been occurring.

An important aspect uncovered from examining the enforcement of forest property rights is the general level of understaffing in the Sarawak Forest Department which has in turn led to a lack of enforcement of the management and forest engineering plans set for logging companies. For example, protected species of trees valued by native communities have been cut down, illegal re-entry into forest coupes have occurred repeatedly contrary to guidelines that disallow such activities, and soil erosion and river pollution have been widespread in areas where logging has occurred. This lack of enforcement has also led to impacts on forested areas to the extent that even the sustainability of timber production in these areas have been questioned.

There needs to be an investigation into why rights have either not been adequately defined or enforced. This leads to part c of the analytical framework for explaining social coordination and conflicts: examining the costs of definition and enforcement compared to its benefits. The next chapter addresses this issue.

Chapter Five

Economic Barriers to Social Coordination: Costs of Defining and Enforcing Property Rights

5.1 Definition and Enforcement Costs and Forest Functions: Introduction

Difficulties in defining and enforcing property rights for the various forests function may be due to monetary and non-monetary costs associated with carrying out such activities, referred to as specification (definition and enforcement), costs found in part c of the analytical framework outlined in Section 2.6. This chapter continues the discussion of property rights specification, with the emphasis here on examining economic barriers that prevent rights from being defined and enforced.

Sarawak's forested areas occupy nearly 8.3 million hectares of land out of the total land mass of 12.5 million hectares. This physical vastness (spatial distribution) and associated identification, measurement, monitoring, exclusion and penalising costs can make precise specification of rights to forests impossible, as costs of specification may be higher than its benefits. Prohibitive definition and enforcement costs prevent clear signalling of forest function values and the provision of incentives for the market or political system to coordinate the use of the various forest functions.

Section 5.2 provides a brief reiteration of the part of the analytical framework relevant to this chapter (part c). Section 5.3 discusses the costs involved in defining and enforcing rights in Sarawak, with Sections 5.3.1 to 5.3.7 providing a breakdown of the costs of defining and enforcing rights for individual forest functions. Section 5.4 presents the monetary costs of defining and enforcing property rights to enhance social coordination in the overall use of forests. Section 5.5 concludes.

5.2 Forest Functions and the Costs of Defining and Enforcing Rights: Overview

Drawing from part c of the analytical framework in Section 2.6, the economic barriers involved in defining and enforcing property rights may involve the following:

1. Costs of Defining Rights -- Identifying Forested Areas for Various Purposes (Constitution), Uses, and User Rights [Part c(i) of the Analytical Framework]

Defining rights to forest functions involves identifying forested areas to be set aside for their potential uses. A complete constitution of forested areas in Sarawak will take into account pre-existing informal native rights, which may be extinguished with compensation, or co-exist with new user rights, depending on the situation. Identification (constitution) involves ground surveys for land stratification and formal classification of forest land. Identification (including ground surveys)¹ is necessary for formally establishing new rights to an area and for compensating the holders of extinguished pre-existing rights, for formally recording existing informal rights in an area, and for classification of land into its various categories in Sarawak.

Definition of property rights as noted in the analytical framework does not necessitate a precise measurement of benefits for every forest function. Details of the size and location of an area is a sufficient form of measurement for most purposes, but inventories are carried out for timber and plant and animal diversity to track resource use or measure biodiversity in the area. Such costs will also be examined.

2. Costs of Enforcing Property Rights [Part c(ii) of the analytical framework]

Calculations on the costs of monitoring all forested areas to detect² and penalise prohibited activities, such as illegal logging or illegal shifting cultivation, will be provided. For forested areas containing native rights, native communities themselves may also be undertaking monitoring activities. The costs of demarcating and maintaining boundaries will also be provided, as boundary demarcation and maintenance are part of enforcing exclusive rights to an area.

Enforcement also includes supervision. Supervision involves ensuring that logging operators comply with the management and forest engineering plans set by the Sarawak

¹ These surveys would involve a topographic survey where distances, slopes, elevations, contour lines, rivers, creeks, roads, rocks, swamps, cliffs, positions of commercial trees, and presumably native graveyards (where marked), shifting cultivation areas (active and fallow), human abode can be plotted on the map. In addition, pegs can be used to demarcate the areas surveyed.

Forest Department. Proper supervision includes monitoring logging operators in three stages: prior, during, and after trees have been felled in a particular area. Prior to logging, supervision ensures that areas about to be logged have been properly demarcated and that plans for and the construction of roads to transport logs comply to the engineering standards that would minimise soil erosion, water pollution, and avoid areas of water catchments. During logging, supervision ensures that trees are felled according to regulations (widths, species), that damage to remaining stands are minimised, that protected species of trees remain standing, and that native customary areas containing edible and non-edible forest products and fallow shifting cultivation areas remain undisturbed. In the post-logging period, logged areas are inspected to assess final damage (final inspection report) and the adequacy of existing drainage in abandoned tractor tracks. In addition, non compliance with regulations contained in the management and forest engineering plans (felling undergirth trees, damaging existing stands, damaging protected species, high stumps, and not extracting merchantable timber, improper drainage) are penalised.³ This could involve penalties imposed on the spot (compound fines), or legal action leading to conviction in courts.

5.3 Forest Functions and the Costs of Defining and Enforcing Rights

A discussion of costs associated with specifying rights to individual forest function will now be carried out, pointing to the activities and costs necessary for defining and enforcing property rights. This is in line with part c(i) and part c(ii) of the analytical framework discussed in the previous section.

5.3.1 Commercial Timber and Logging

To allocate forests for commercial timber harvesting, areas must be identified and designated for such purposes. The constitution of forests as PFEs is intended to identify and exclude a particular area for harvesting timber. This involves conducting a ground survey of the proposed area. In addition, a baseline inventory must be conducted to enable

² Involving the use of aerial and satellite photographs, and ground patrols.

³ International Tropical Timber Organization (ITTO), *Ten-Year Development Plan for the Model Forest Management Area - Sarawak (MFMA), 1996-2006: Forest Land Use and Management Plans Training, Research and Development and Demonstrations*. ITTO Project PD 105/90 Rev. 1 (F). Japan and Malaysia: International Tropical Timber Organization and Forest Department, Sarawak, 1996, Appendices 1 and 2.

tracking of subsequent forest use in the area. The monitoring and supervision of commercial timber harvesting activities according to the Management Plan and Forest Engineering Plan aims to ensure that timber will be harvested sustainably, and that forests will be managed from a perspective that considers the concerns of non-timber groups (social and environmental functions).

- *Costs of Defining Rights: Identifying and Creating Rights for Timber Harvesting [Part c(i)]*

Identifying property right holders to PFEs is relatively costless as only a single concessionaire has the right to harvest timber from a large tract of forested area. This right is in turn contracted out to one main contractor who oversees and sub-contracts out the various harvesting operations to different parties. The structure of the concession system was outlined in Appendix 4.2 of Chapter Four. The contractor, and not the concessionaire, was previously responsible for contraventions in forest laws. In 1993, legislation was changed to directly involve the concessionaire as the main party responsible for contraventions.⁴ However, surveying the land and identifying the timber content and excluding such areas for commercial timber harvesting is a costly exercise. Forested areas in Sarawak must be surveyed during the process of constitution. Another two million hectares of forests are under consideration for PFEs, and have not been constituted by the Forest Department. This would amount to RM 50 million (RM 25 × 2,000,000 hectares)⁵ in 1990 currency, which is 2.18 times the annual recurrent expenditure of the Sarawak Forest Department for the year 1990.

- *Costs of Defining Rights: Measuring Benefits in Forested Areas through Inventories [Part c(i)]*

Forests must be inventoried so that their potential timber content is known. Currently, over 50 percent of Sarawak's total forest areas have been inventoried by the Forest Department. The remaining 50 percent, or 4 million hectares, would incur a cost of RM 26.2 million

⁴ This was discussed in Section 4.3.1 of Chapter Four under the sub-section "Harvesting Rights in the Management Plans of PFEs and SFs"

⁵ O.R. Morningstar, and N.M. Knight, *Implementing Agroforestry in Sarawak: A Final Report on the Sabal Pilot Agroforestry Project*. Forest Research Report RR1, Reforestation Unit, Kuching: Forest Department, March 1990, Appendix 2.1.

(RM 6.55 per hectare),⁶ or 114.3 percent of the annual recurrent expenditure of the Forest Department in 1990.⁷ Concentrating the budget on conducting inventories alone is impractical, as spending has to be allocated for aspects like enforcing Management Plans, Forest Engineering Plans, and management of National Parks and Wild Life Sanctuaries. In the early 1990s, an average inventory of 150,000 hectares was undertaken on an annual basis (Hitam and Wong, 1992). As such, the total annual costs would have been RM 982,500 (RM 6.55 per hectare) in 1990 currency, or 4.3 percent of the Annual Recurrent Expenditure of 1990 for another 26.67 years.⁸ However, around 400,000 hectares of forests are harvested per annum. Hence, the areas inventoried should be increased to this level. This would amount to RM 2.62 million, or 11.4 percent of the recurrent expenditure of 1990.

- *Costs of Enforcement: Monitoring by Aerial and Satellite Photographs and Fencing for Exclusion [Part c(ii)]*

In order to prevent such areas from being encroached on by non-authorised users especially for illegal shifting cultivation, constituted PFE areas must be monitored

⁶ This figure is estimated from the *Annual Report of the Forest Department Sarawak 1993*, p. 105, in terms of Total Personal Emoluments/Area of Permanent Forest Estate in hectares. It would not be too far wrong to state that this cost is also applicable for 1990 as inflation rates were low and government wages were unchanging from the late 1980s through the 1990s in Sarawak.

⁷ This includes a ground reconnaissance survey before detailed site surveying where boundaries will be demarcated, cut and cleared with a width of one meter, and all corners marked with poles. The figures available in the following publication should only serve as a very rough guide as it can vary according to the terrain and location of the site. See O.R. Morningstar, and N.M. Knight, op. cit., Appendix 2.1. This rate compares well to the figure of RM 10-25 per hectare provided by UNDP/FAO, *Forestry Development Project Sarawak, Planned Harvesting in the Mixed Dipterocarp Forest of Sarawak: The Road Network* (By H.M. Marn, Field Document No. 14, FO: MAL/76/008). Kuching: Forest Department, February 1982, p. 80.

⁸ The Total Annual Recurrent Expenditure in 1990 (Items 1 and 2 of Annual Recurrent Expenditure Items) was RM 22.92 million. In addition, timber companies have to perform their own inventory (operational level forest inventories) on a coupe by coupe basis prior to harvesting. This is a more detailed process which occurs just before forests are harvested whereas the first inventory process by the Forest Department is carried out for general identifying of forested areas. The intention is to establish commercial timber volumes and species of timber present in order to plan efficient harvesting operations; M. Kavanagh, A.A. Rahim, and C.J. Hails, *Rainforest Conservation in Sarawak: International Policy for WWF*. Malaysia: WWF Project No. 3262, Nov. 1989, p. 26. This is rechecked by the forest department on a sample basis of around 10 percent.

⁹ Demarcation involves the cutting of new boundaries while maintenance is just the cleaning of existing boundaries (Hitam and Wong, 1992).

¹⁰ Sylvester Tong, and Lim Heng Choo, "Forest Protection and Constitution in Sarawak and Their Problems", Paper Presented at the Persidangan Perhutanan Malaysia Kespuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989, p. 2.

¹¹ Naturally not all boundaries have to be maintained every year as it takes a few years before boundaries become fuzzy. The Forest Department attempts to maintain boundaries once every three years. *ibid.*

regularly (at least annually during the beginning of the shifting cultivation cycle). Currently there are 4.41 million hectares which constitute Permanent Forest Estates, with the remaining 1.6 million hectares under constitution. One aerial survey per annum is RM 1.43 million for these areas in 1989 currency. This could be supplemented by SPOT satellite imagery costing RM 0.03995 million per take perhaps at every second quarter, amounting to RM 0.48 million. Total cost would be RM 1.83 million per year in 1989 currency for PFEs. This would be nearly three times the 1990 expenditure on General Forest Management.

Demarcation and clearance of boundaries also prevent encroachments, so that non-right holders can be excluded, generally, by identifying and penalising illegitimate use. The demarcation and maintenance¹³ of general boundaries is undertaken by the Forest Department. The estimated total distance of such boundaries is 50,000 km in Sarawak.¹⁴ Costs of clearing and demarcation have been estimated to be around RM 300 per km for hilly terrain and RM 100 per km for swampy areas. Such areas have to be demarcated to identify such areas as Permanent Forest Estates (PFEs). Around 4,100 km needs to be cleared or maintained every year in order that some semblance of a boundary exists for PFEs.¹⁵ Forest officers estimate this to cost around RM 4 million per year.¹⁶ This represents the first stage in the process where rights are defined for forested areas designated for commercial timber and logging.

- *Costs of Enforcement: Monitoring by Supervision and Penalising [Part c(ii)]*

In terms of enforcement through field supervision, the Forest Department has to ensure that logging companies comply with Management Plans (timber harvesting procedures)

¹² S.A. Hitam, and S.K. Wong, "Privatisation of Forest Activities in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 133.

¹³ Demarcation involves the cutting of new boundaries while maintenance is just the cleaning of existing boundaries (Hitam and Wong, 1992).

¹⁴ Sylvester Tong, and Lim Heng Choo, "Forest Protection and Constitution in Sarawak and Their Problems", Paper Presented at the Persidangan Perhutanan Malaysia Kesepuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989, p. 2.

¹⁵ Naturally not all boundaries have to be maintained every year as it takes a few years before boundaries become fuzzy. The Forest Department attempts to maintain boundaries once every three years. *ibid.*

¹⁶ S.A. Hitam, and S.K. Wong, "Privatisation of Forest Activities in Sarawak", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 133.

and Forest Engineering Plans (road construction) discussed in Section 4.3.1 and Appendix 4.3 of Chapter Four respectively. As the ITTO (1994c) team has pointed out, harvesting activities have to be supervised on an on-going basis, to enforce prescribed cutting limits and standards, to minimise damage to young trees in the vicinity, and to check road profile alignments and construction to ensure that they comply with the engineering standards set by the Forest Department.

In recent years, the Sarawak Forest Department has allocated 568 staff in the four forest section offices¹⁷ for field duties. Costs for this level of staffing is estimated to be around RM 6.82 million per year (568 staff \times RM 12,000) in 1990 currency. Duties of such staff include boundary constitution, silviculture management, logging supervision, and revenue collection (royalties and premiums).¹⁸ Appendix 5.1 provides the percentage breakdown of field staff into the various sections. ITTO (1994c) estimated that about 50 staff only were involved in pre- and post-logging inspections,¹⁹ monitoring 415,000 hectares of forests (namely, staff involved in monitoring and enforcing forest legislation and regulations pertaining to Management Plans and Forest Engineering Plans).²⁰ If supervision is to be carried out on on-going basis, and on more stringent standards,²¹ a conservative estimate of RM 2.42 million per year in 1990 currency will be spent on supervision;²² an addition of at least RM 1.82 million (2.42 million-0.6 million; an additional 152 "man years", equivalent to 10.56 percent of the 1990 Total Recurrent Expenditure).²³ An additional RM 3.06 million in 1990 currency (an additional 255 "man years", equivalent to 13.35 percent of the 1990 Departmental Expenditure) needs to be spent if higher frequency inspections are to be carried out on steepplands. The standards set by ITTO will also protect edible and

¹⁷ Kuching, Sibul, Bintulu, and Miri.

¹⁸ International Tropical Timber Organization (ITTO). *Pre-project Report: Manpower Development of Sarawak Forest Sector*. Ref No.: PCI(VII)/7. Prepared by the Forest Department, State Government of Sarawak, Malaysia, 1994c, p. 15.

¹⁹ *ibid.*, p. 16. ITTO does provide a word of caution in how this figure has been estimated. The figure is judgemental rather than derived from time studies, and it represents an average over all production without stratification for differences in forest types, accessibility, or topography. Nevertheless, ITTO also points out that this is a "generous" estimate; the real figure could be lower than this.

²⁰ Staffing costs in this instance would amount to $50 \times \text{RM } 1,000 \times 12 = \text{RM } 0.6 \text{ million}$. See footnote 22 for basis of estimation of staff costs.

²¹ Three times weekly for PFEs and once per week for State Land Forests.

²² Assuming a salary of RM 1,000 per inspector per month. Based on salary figures in *Economic Case for Natural Forest Management: Main Report*. Japan and Malaysia: ITTO and FRIM, December 1994a, p. 43.

²³ This figure excludes the Development and Special Expenditure carried out by the Sarawak Forest Department.

non-edible products available in forests, prevent the destruction of biodiversity, prevent soil erosion, and ensure that the water flows are regulated. Such levels of staffing would ensure that the above conditions in Management Plans and Forest Engineering Plans were adhered to, illegal cases of intrusion and shifting cultivation in Permanent Forest Estates were prosecuted, and offences related to illegal logging, royalty evasion, destruction of biodiversity and protected species by loggers were identified and prosecuted. On-going monitoring, as suggested by ITTO (1994c), would have prevented many of the offences related to harvesting as forestry officers would be in the forests supervising the day-to-day operations of logging companies. However, enforcement, other than that of supervision for cases like the illegal transfers of ownership and shifting cultivation, still need to be prosecuted by forest officers, and enforced by the courts. This will incur costs. Prosecutions in court are normally in relation to illegal transfers of ownership or breaches of agreement between timber contractors and sub-contractors. There is one instance where court costs amounted to RM 1,000 in resolving an illegal transfer of ownership case in Peninsula Malaysia.²⁴ Even if court costs are high, such costs are normally passed to the party guilty of the offence if the prosecution wins the case. However, the costs of Forest Department Officers' time devoted to such cases needs to be taken into account. Such figures are not available.

5.3.2 Native Shifting Cultivation and Agriculture

Areas where shifting cultivation is currently carried out can be easily identified, as these areas are 'indicated' by slashing, felling of trees, and then burning before the plot is cultivated by the use of human labour and simple agricultural implements. The rotation of areas, rather than crops, is the norm with short periods of cultivation followed by long fallow periods, involving the continual use of secondary forests.²⁵ Initially, the securing of a territory by a native group is either through occupation of an "unowned" forested area, conquest, purchase (giving of gifts), and permission (payment of tax to a ruler).²⁶

²⁴ Hashim Bin Adam v Daya Utama Sendirian Berhad 1 MLJ 1980 125

²⁵ R.A. Cramb, and I.R. Wills, "The Role of Traditional Institutions in Rural Development: Community-Based Land Tenure and Government Land Policy in Sarawak, Malaysia", *World Development* 18, No. 3 (March 1990), p. 349.

²⁶ A.J.N. Richards, *Sarawak: Land Law and Adat*. Kuching, Sarawak: Government Printing Office, 1961, p. 30.

Thereafter, the territory or forested area is allocated to households (*bilek*) within the native group for shifting cultivation and other native subsistence activities.

- *Costs of Defining Rights: Identifying and Creating Rights for Shifting Cultivation [Part c(i)]*

Defining rights to shifting cultivation involves two types of costs: one incurred by the state and the other by the shifting cultivator. First, such areas must be identified by the Department of Land and Survey or the Sarawak Forest Department. It is estimated that at least 3.3 million hectares of forest land belong to native communities (lands where native customary rights exist including shifting cultivation areas). The cost of identifying shifting cultivation areas (fallow and active) through ground surveys would amount to RM 82.5 million in 1990 currency (3,300,000 hectares \times RM 25).

There are also costs incurred by the cultivator to create rights in shifting cultivation;²⁷ however these costs are not related to enhancing social coordination. A ground survey to delineate native rights in shifting cultivation is all that is needed to enhance social coordination in the use of forests.

- *Costs of Enforcement: Monitoring of Farms by Natives [Part c(ii)]*

The accompanying monitoring costs to prevent unauthorised uses of active shifting cultivation areas are low for the reason that monitoring by natives to protect such areas from pests and wild animals (which takes up to 30 days per farm per year)²⁸ also prevents any other form of intrusion. Putting all this into monetary terms in terms of 1990 currency -- wages for native contract labour per day -- would amount to monitoring costs of RM 450 per farm (1.82 hectares) for each annual planting season, or RM 247 per hectare of

²⁷ For primary jungles, slashing, felling, and secondary clearing can take up to 61 man days per hectare (25 days per acre). Freeman (1955) defines a 'man day' as a normal day of work for either a male or female. For secondary jungles (*damun*), this can take up to 40 man days per hectare (16 days per acre). In terms of costs in 1990 dollars and wage rates given in Morningstar and Knight (1990), this would amount to RM 915 per hectare for primary forests and RM 600 for secondary forests. See J.D. Freeman, *Iban Agriculture: A Report on the Shifting Cultivation of Hill Rice by the Iban of Sarawak*. Colonial Research Studies No. 18. London: Her Majesty's Stationery Office, 1955, p.90.

²⁸ Size of an average farm was around 1.82 hectares (4.5 acres) per household (*bilek*) in a longhouse; *ibid.*, p. 92.

forest per year. Again, these are necessary farming costs, the accompanying monitoring costs may therefore be free. The boundaries of individual plots are generally identified by natural features such as ridges and gullies and unfelled hardwood trees²⁹ or by "rows of bamboo planted along property lines"³⁰ or by fences.³¹ Knowledge about these boundaries is transmitted orally in lengthy genealogies.³² Even to outsiders, it would not be difficult to identify active shifting cultivation plots, as they would be areas where slashing and burning has been performed with natives guarding their plots to ensure that pests do not attack their crops. For fallow areas, provided that such areas have been formally recorded in a land survey, and monitored by the Forest Department through its periodic aerial surveys, costs would be minimal for natives, as an aerial survey by the Forest Department can include monitoring of such areas.

Disputes over land ownership rights are settled in accordance to the principles of *adat* by the leader (*Tua Kampong*) of the community and the council of elders, or the community headman (*tuai rumah*) in the case of the Iban (Cramb, 1987). The costs of monitoring and enforcement are minimal within native communities, as pointed out by Cramb:

Accepting the legitimacy of traditional spheres of authority meant that the cohesion and continuity of the community were enhanced and that individual utilization of land could proceed within an assured framework of property rules and contractual arrangements, with only a minimum of resources required for monitoring and enforcement.³³

Hence, native land tenure systems have been largely successful in providing orderly access to land resources with minimal resources employed in defining, monitoring, and enforcing these rights as native customary areas are well defined and delineated among themselves. Rights to the use of areas in forests are exclusive to individual households within the particular group and benefits and costs are internalised by the individual household

²⁹ R.A. Cramb, *The Evolution of Iban Land Tenure: A Study in Institutional Economics*. Unpublished PhD Thesis, Department of Economics, Monash University, June 1987, p. 108.

³⁰ V.H. Sutlive Jr., *The Iban of Sarawak: Chronicle of a Vanishing World*. Malaysia: S. Abdul Majeed and Company, 1992, p. 24

³¹ J.D. Sagan, "The Kenyah of Sarawak", *The Sarawak Museum Journal* XL (Special Issue No. 4, Part III), No. 61 (New Series) (December 1989), p. 126.

³² Sutlive, op. cit., p. 24.

³³ Cramb, op. cit., pp. 113-114.

concerned. Even free rider tendencies have been submerged under the native system of land use, as Cramb and Wills (1990) point out:

Close personal interaction over a long period, reinforced by the influence of a shared morality, serves to facilitate the negotiation of rights to land, to communicate information about rights, and to monitor and exercise those rights. A key element in the success of traditional Iban land tenure has been that free-rider tendencies (the propensity of individuals to act in a purely self-interested fashion to the detriment of collective interest, for example, flouting tenure rules) have been voluntarily curtailed due to a shared concern for the survival of the community.³⁴

Although intra-community disputes have been either uncommon or costlessly settled, inter-community disputes occur more frequently. Monitoring costs of shifting cultivation plots would not have been high, as intrusions into fallow areas belonging to a particular household could be easily detected by the affected household or members of the longhouse community. The costs of enforcing rights to shifting cultivation has traditionally been settled by discussion between regional leaders, and in cases where disputes could not be settled, they have been resolved by "various forms of ritualized contest, such as fighting with clubs or the diving ordeal ...".³⁵ In recent years, however, disputes have been settled through courts: available court cases indicate that informal rights to shifting cultivation, land ownership, and communal ownership of forest lands have been recognised and enforced by native and formal courts through resort to both legislation and native customary law. This, in itself, represents an enforcement cost. Sometimes, this has involved the calling of native witnesses who have to travel from the interior to the District Courts. There are also instances where the magistrate has had to travel to the plot of forested area where the dispute had arisen, in order to examine the evidence presented. Court costs have been reported to be in the vicinity of RM 35 per hearing for less complex cases to RM 75 for the more difficult cases.³⁶

³⁴ Cramb and Wills, *op. cit.*, p. 349.

³⁵ Cramb and Wills, *op. cit.*, p. 349.

The costs of specifying rights (exclusion) increase dramatically when logging companies are involved in using forested areas, largely due to the expense of communicating information about the existence of shifting cultivation areas which have not been formally identified and recorded in maps, and of the exclusion of native rights from logging encroachments. Although shifting cultivation areas (active and fallow) are reasonably well defined and identified among the native communities themselves, problems arise in identifying fallow areas when the Forest Department is in the process of constituting forested areas as PFEs. This has arisen because the ownership of most sites, although recognised as a legal entity, has not been formally recorded in the Land Register. In this instance, the costs involved in excluding such areas involves the natives being aware that their cultivation rights are in the process of being extinguished (information costs), and travelling to, and communicating, the existence of informal rights in such areas (communication costs) to the District Office. In addition, natives also have the onus of proving ownership of land or cultivation of a site, and this may involve settling the case through lengthy court proceedings.

The high costs of ascertaining and formally recording land owned by native communities in Sarawak through ground surveys represent a major barrier to specifying rights to shifting cultivation areas. The identification of shifting cultivation areas is costly, especially where areas have been left fallow for long periods. Although it is possible for the officers in the Sarawak Forest Department and Department of Land and Survey to identify forested areas in which shifting cultivation is currently being carried out, and hence take the necessary measures to exclude or compensate existing native rights in the area, it is harder to identify forested areas which have been left fallow for years. Official records report that only 76,000 hectares out of the 3.3 million hectares of native land has been cultivated with rice and other crops in the 1995 planting season.³⁷ It is not possible to carry out ground surveys of fallow areas which have been left uncultivated for many years

³⁶ See *T.R. Nasat Anak Chapi v T.R. Mandai Anak Genging Sibu Native Court of Appeal Case No. NA 2/62* in *Lee Hun Hoe*, p. 97 and *Nyalong Anak Bungan v. The Superintendent of Lands & Surveys 2nd Division, Simanggang* [1967] 2 MLJ 249

³⁷ *Agricultural Statistics of Sarawak 1996*. Department of Agriculture Sarawak Malaysia, p. 31.

as these areas cannot be easily identified. Further, given the short 3-month period between declaration and revocation, natives living in the deep interior may not have adequate time to bring their informal rights in these areas to the attention of the authorities.³⁸

Also, as discussed in Chapter Four, there are instances when active shifting cultivation areas have been destroyed by logging companies traversing such areas to get to logging sites. Offenders can be easily identified, as a single logging company normally operates within a large area. But the costs of penalising logging companies are high, as natives would have to personally lodge a report to the police, Forest Department officers, and members of parliament which may be located a considerable distance away. Also, not all violations have been settled amicably with compensation or in accordance to legislation. Such anomalies can be resolved if on-going supervision is carried out. The ITTO (1994c) proposal for the recruitment of 255 supervisory officers on an on-going basis, discussed in Section 5.3, would have prevented such intrusion from occurring. This is important as the inadvertent granting of logging concession rights which conflict with existing informal rights in customary land has been a major source of conflict. Cleary and Eaton (1992) state this succinctly:

It is, however, the granting of logging concessions on what has traditionally been regarded as customary land that has caused the most resentment and opposition. Conflicts between customary landowners and loggers have been widespread. They have occurred in districts as far apart as Lundu, Bintulu, Belaga, and Limbang. They have not been confined to one ethnic group and have affected a wide range of indigenous peoples.³⁹

The root of the problem is that with forests covering seventy six percent of the total area in Sarawak, and with over ninety percent of these areas being leased out to concessionaires, it is inevitable that native cultivation rights will be violated, and, at times, unintentionally. This has arisen because many native customary areas and interior land are yet to be ground surveyed, resulting in boundaries between state land and native land remaining unclear. High surveying costs have prevented the survey of forest lands in shifting cultivation, hence areas of fallow shifting cultivation have been included in PFEs.

³⁸ This was discussed in Section 4.3.1 of Chapter Four.

³⁹ M. Cleary, and P. Eaton, *Borneo: Change and Development*. Kuala Lumpur: Oxford University Press, 1995, p. 178.

In the case of the nomadic Penan who do not practice any form of cultivation, and hence do not clear forested areas like other groups, there is no official recognition of rights to land used by them. The Penan practice *molong*, which is a method of using forests on a sustained yield basis (Brosius, 1992; Langub, 1996). *Molong* has two functions. First, it serves as a way to monitor information on the availability of resources over vast tracts of land (inventory); and second, it prevents the indiscriminate cutting of fruit trees and sago.⁴⁰ However, the nomadic lifestyle of the Penan has made it difficult for them to establish formal land claims to an area in a legal manner, as the traditional economy of the Penan does not include the clearance of land for subsistence.⁴¹ Costs of enforcement are not the issue in this instance, but rather that of defining rights for the Penan. This would involve a redefinition of areas recognised as native customary areas to take into account the creation of customary rights by Penan which does not involve permanent occupation or land clearance for cultivation (Section 5 of the Land Code).

5.3.3 Edible and Non-Edible Forest Products: Wildlife, Fruits, Vegetables, Sago, Rattan, Palm, and Medicines

In order for forest groups to consider edible and non-edible forest products in social coordination, property rights in these products must be clearly defined and enforced. Such rights exist for the various native groups in Sarawak, as discussed in Chapter Four. Traditionally, individuals can claim exclusive rights to certain valuable fruit trees (*durian*, *sibau*, *lensat*, *engkabang*, *belian*, *tapang*) by clearing the undergrowth round about and erecting a sign (*tanda*) to identify ownership, or by planting such trees in the vicinity of the apartment of the individual household.⁴² In general, there are clearly demarcated

⁴⁰ J.P. Brosius, "Perspectives on Penan Development in Sarawak", *Sarawak Gazette* CXIX, No. 1519 (April 1992), p. 7.

⁴¹ M. Kavanagh, A.A. Rahim, and C.J. Halls, *Rainforest Conservation in Sarawak: International Policy for WWF*. Malaysia: WWF Project No. 3262, Nov. 1989, p. 39 and Cleary and Eaton, op. cit., p. 180.

⁴² Cramb, op. cit., pp. 110-111.

⁴³ *ibid.*, p. 111.

⁴⁴ *ibid.*, p. 107.

⁴⁵ S.C. Chin, "Agriculture and Resource Utilization in a Lowland Rainforest Kenyah Community", (Special Monograph No. 4), *The Sarawak Museum Journal* XXXV, No. 56 (New Series) (December 1985), p. 74.

⁴⁶ F.J. Lian, "The Economics and Ecology of the Production of the Tropical Rainforest Resources by Tribal Groups of Sarawak, Borneo", in J. Dargavel, K. Dixon, and N. Semple, *Changing Tropical Forests: Historical Perspectives on Today's Challenges in Asia, Australasia and Oceania* (Workshop meeting,

boundaries between longhouse communities and these boundaries determine the rights over collecting jungle products.⁴⁷ Past claims to rights where remembered are recognised by the present occupiers of the territory and are accorded due respect.⁴⁸ However, as discussed in Chapter Four, in modern times, official legislation does not comprehensively protect edible and non-edible forest in all forested areas. Such products are only protected if they are located in CFs.

- *Costs of Defining Rights: Identifying and Creating Rights for Forest Products*
[Part c(i)]

Prior to commercial logging in Sarawak, the costs of defining and enforcing ownership rights to forest products in accordance to native practices discussed above were minimal. This was due to the social cohesiveness within native communities cemented by native customary law (*adat*). This did not mean that disputes did not occur, but that such disputes were been resolved through recourse to *adat*.⁵⁰

With the advent of logging, rights to edible and non-edible forest products has to be established through the formation of Communal Forests, in order to completely meet the needs of specific native communities. In this instance, the costs of defining property rights to protect edible and non-edible forest products and wild life take the form of ground surveys and formal constitution of such areas by the Forest Department and the Department of Land and Survey. The costs of defining such areas would be similar to that of the constitution of Forest Reserves and Protected Forests discussed in Section 5.2.1 and in Appendix 5.2.

Inventories of protected edible and non-edible native products in PFEs would also serve to identify and protect such products from being removed or destroyed by logging companies. The conduct of a thorough inventory on 400,000 hectares of PFEs per year

Canberra 16-18 May 1988). Canberra, ACT: Australian National University, Centre for Resource and Environmental Studies, 1988, p. 118.

⁴⁷ *ibid.*

⁴⁸ *ibid.*

⁴⁹ Cleary and Eaton, *op. cit.*, pp. 176-177.

⁵⁰ Hong, E., *Natives of Sarawak: Survival in Borneo's Vanishing Forests*. Malaysia: Institut Masyarakat, 1987, p. 4.

would presumably also identify such native edible and non-edible products. Such costs have been discussed in Section 5.3.1.

Costs of Enforcement: Monitoring by the Sarawak Forest Department [Part c(ii)]

The costs of enforcing rights to edible and non-edible forest products have increased significantly with the advent of commercial logging in forests. This is especially so in Protected Forests in PFEs, where commercial logging has coexisted with the right to hunt and collect forest products. Presently, areas of native cultivation (fruit trees, and engkabang) found in the vicinity of logging concession areas are still recognised as legal entities and are protected by law. Ground surveys and inventories conducted by the Sarawak Forest Department would resolve this issue. Such costs have been discussed above and are summarised in Appendix 5.2.

Enforcement of native rights is normally undertaken through reports or complaints lodged to the police or Forest Department officers, and sometimes through court proceedings. Also, the monitoring of such cultivation areas by natives may be costly (unlike active shifting cultivation areas of rice planting where natives are present in the area), as natives may have moved to another area to undertake rice cultivation activities. However, the ITTO (1994c) proposal of on-going supervision by the additional employment of over two hundred supervisory staff would protect edible and non-edible products in PFEs. In 1990 currency, on-going supervision would cost RM 7.65 per hectare⁵¹ or a total of RM 3.06 million, assuming that 400,000 hectares of forests are logged each year. Using the figure of RM 144 per hectare calculated from compensation paid for edible and non-edible products in the case of the Bakun Dam, then the cost of RM 7.65 per hectare is small in comparison to the benefits of protecting such products.

5.3.4 Human Abode and Native Graveyards

Generally, identifying abodes and native burial grounds is easy, as this would be indicated by the physical structure of the abode, and several *belian* posts or other forms of wooden

posts protruding from the ground in the case of graveyards. However, there is the difficulty of proving formal ownership of human abodes and the said burial grounds and shrines by particular groups of natives, as many native customary areas and interior land are yet to be surveyed, and hence boundaries of native lands are unclear to officials.

- *Costs of Definition: Identifying Human Abodes and Native Burial Grounds [Part c(i)]*

The costs of formally specifying⁵² rights to abodes, and native burial grounds and shrines are high, due to the vastness of lands and difficult terrain in Sarawak. There is therefore this dilemma: the importance of abodes and burial grounds is recognised and defined in legislation, but problems of specification arise because ownership has not been formally established. In specifying rights to abodes and native burial grounds, the state would have to bear the costs of ascertaining ownership (identifying users and owners) of the tract of native customary land through courts, the Forest Department or the Lands and Survey Department. The costs involved in identifying the 3.3 million hectares of informal native customary land, of RM 82.5 million in 1990 currency (discussed in Section 5.3.2) would also provide for the identification of areas containing native abodes and burial grounds.

- *Costs of Enforcement: Monitoring by Native Groups and Penalising [Part c(ii)]*

There would be minimal costs in monitoring native abodes as natives themselves will be living in these structures. Furthermore, even if native groups are away (from the main longhouse due to the planting season), the physical size of such structures indicate the presence of native abodes and would deter encroachment into such areas.

On the other hand, native burial grounds are at times far from areas where natives are presently living. This is true in many cases, and in turn makes monitoring of burial grounds very costly if undertaken by the natives themselves. Offenders who desecrate burial grounds can usually be easily identified, as a single logging company normally

⁵¹ "Big Dam Looms Over Malaysian Tribes", Reuters World Service, 7 August 1996 BC Cycle. Calculated in the context of the Bakun Dam in Sarawak by dividing the proposed rate of compensation over the total area of the dam (RM 10 million/69,000 hectares).

⁵² Officially recording such areas in the Land Register.

operates in a reasonably large area, but the cost of penalising the logging company would be high, as the offender would have to be penalised through courts, which can be costly and time-consuming and uncertain as to the result. Natives would also be inconvenienced by having to make an appearance in the courts; remembering that some of the native groups live far away from administrative centres. Alternatively, native groups can try to enforce their rights to graveyards by complaints to the authorities or direct confrontation with the timber company itself. Again, if there were on-going supervision of logging activities as per ITTO (1994c), this problem would be substantially resolved.

5.3.5 Ecological Systems

The conservation of biodiversity in Sarawak is effected through the establishment of National Parks and Wildlife Sanctuaries which are designated as Totally Protected Areas (TPAs). All major habitats in Sarawak are represented in established and proposed TPAs; although some mangroves and peat swamp are still currently underrepresented.⁵³ The protection of biodiversity in Sarawak involves the following activities: a survey of proposed biodiversity areas to collect information on species and ecosystems; a formal identification of such areas for the stated purpose of conservation; regular monitoring to ensure that such areas are protected; and penalties imposed on offenders who violate rules in National Parks and Wildlife Sanctuaries.

- *Costs of Definition: Identifying Species and Areas, and Constituting Biodiversity Areas [Part c(i)]*

As Morshidi and Gumal (1995) of the Sarawak Forest Department point out, effective conservation of biodiversity must be based on accurate information. There is still inadequate information about forest ecosystems. Isolated information is only available on the proboscis monkey, hornbills, primate communities, benefits of hunting and game for the various native groups, timber species, palms, and orchids.⁵⁴ The Forest Department has recognised that it does not have sufficient data for the detailed management of wildlife, and has attributed this to the lack of trained personnel and staff to collect such

⁵³ A.H.K.A. Morshidi, and M.T. Gumal, "The Role of Totally Protected Areas in Preserving Biological Diversity in Sarawak", in R.B. Primack, and T.E. Lovejoy, eds., *Ecology, Conservation, and Management of Southeast Asian Forests*. New Haven and London: Yale University Press, 1995, p. 208.

information.⁵⁵ The collection of such information is partly based on the research efforts of international organisations like the World Wide Fund for Nature, Malaysia, and Wildlife Conservation Society (formerly known as Wildlife Conservation International).

The collection of information needed for the management and conservation of biodiversity is costly. A topographical survey is necessary to determine soil types and physical characteristics (terrain, types of forests). In addition, a faunal survey has to be carried out to monitor populations and determine the wildlife resource base in an area and the types of vegetation in the area. The method used in Sarawak is the strip survey where survey trails of 2 km long are cut at each site and marked with flagging tape at 20 m intervals.⁵⁶ The trails are then walked over a few times during the day, with the observer listening and looking for traces of wildlife. Population density is then measured by pooling data from all trails. Cost figures for such activities are not available; however, estimates provided by Hitam and Wong (1992) -- the basic timber inventory costs of RM 2.95 per hectare based on figures from the Forest Department⁵⁷ -- provide a rough estimate of the costs of making an inventory of plant and animal species. Adding wages, this would amount to RM 7.03 per hectare.⁵⁸ Assuming that all Totally Protected Areas (TPAs) need to be inventoried in detail as per the strip survey methodology, then the costs of surveying all such areas would be RM 2.03 million ($\text{RM } 7.03 \times 288,806 \text{ hectares}$) each time a survey is undertaken for all established National Parks and Wild Life Sanctuaries. This would be 2.23 times the 1990 Annual Recurrent Expenditure for Management of National Parks and Wildlife of RM 0.9 million.

There are costs to defining rights to National Parks and Wildlife Sanctuaries. Like PFEs, the constitution of National Parks and Wildlife Sanctuaries follows a formal procedure where a declaration of intention needs to be published in the Sarawak Gazette. A period of at least three months is allowed for affected parties owning customary rights in the area to declare such rights (and to be allowed to continue to practice such rights in the area or to

⁵⁴ *ibid.*, p. 209.

⁵⁵ *ibid.*

⁵⁶ M.E. Meredith, "A Faunal Survey of Batang Ai National Park, Sarawak, Malaysia", *The Sarawak Museum Journal* XLVIII, No. 69 (New Series) (December 1995), p. 138.

⁵⁷ Presumably, forest inventory could also include wildlife and other fauna together with the timber stock.

receive compensation in kind or in monetary form). Assuming a cost of RM 25 per hectare for a once-only-survey, as ascertained for the topographical survey, then the costs are RM 7.22 million ($\text{RM } 25 \times 288,806$) in 1990 currency for National Parks and Wildlife Sanctuaries that are currently in existence in Sarawak. For the remaining 749,663 hectares of proposed parks and sanctuaries, costs would be RM 18.742 million ($\text{RM } 25 \times 749,663$) in 1990 currency.

- *Costs of Enforcement: Monitoring by the Sarawak Forest Department [Part c(ii)]*

Monitoring costs would vary depending on the type of technology used for monitoring National Parks and Wildlife Sanctuaries.⁵⁸ To monitor illegal shifting cultivation, aerial surveys would cost around RM 69,024 ($\text{RM } 0.239 \times 288,806$ hectares) per survey of all Sarawak's established TPAs in 1989 currency. Continuous protection (monitoring) costs to prevent poaching or other illegal activities have not been provided for Sarawakian forests but an example has been provided for Sabahan forests. In a study of the Garinono Forest Reserve, it has been estimated that the annual cost of protecting a forest under continuous surveillance is RM 135.00 per hectare in the early 1990s (Mannan and Awang, 1992). This cost includes wages and allowance (RM 118.00 per hectare), vehicle running expenses (RM 4.00 per hectare), and building maintenance and general maintenance (RM 13.00 per hectare).⁶⁰ For Sarawak, a management cost⁶¹ of RM 3.00 per hectare (excluding wages) has been provided by the Sarawak Forest Department.⁶² Using wage cost figures provided by Mannan and Awang (1992) for Sabah, the cost of continuous monitoring to protect biodiversity, including wages and allowances, would therefore be in the vicinity of RM 38.99 million per year for the 288,806 hectares of forested areas that have been

⁵⁸ Estimated from *Annual Report of the Forest Department Sarawak 1993*, p. 105. (Total Personal Emolument/Area of Established NPs and WSs)

⁵⁹ This excludes proposed National Parks and Wild Life Sanctuaries which would increase the total forest areas to around one million hectares or around 11.5 percent of Sarawak's forested area (Morshidi and Gumal, 1995).

⁶⁰ S. Mannan, and Y. Awang, "Development and Forest Management: An Assessment Based on Field Experiences", *Proceedings of the 11th Malaysian Forestry Conference*, Kota Kinabalu, Sabah, 27 July - 2 August 1992, p. 67.

⁶¹ Management of National Parks in Sarawak includes the following duties: enforcement of legislation (including the protection of biodiversity) in National Parks and Wildlife Sanctuaries; research on wildlife and fauna; maintenance of visitor facilities such as the resthouse, hostel, public toilets, picnic shelters, signboards, footpaths, plankwalks; and upkeep of site office and staff quarters (Hitam and Wong, 1992).

⁶² *Economic Case for Natural Forest Management: Main Report*. op. cit., 1994a, p. 34.

currently established as National Parks and Wildlife Sanctuaries (RM 135×288,000). If the proposed areas are included in this figure, this increases to RM 140.2 million. This is detailed in Appendix 5.2. However, costs could be lowered if inspections were reduced to a twice weekly basis. Using the cost figures for supervising timber operations discussed in ITTO (1994c) and Section 5.3.1, costs would amount to RM 12.6 million for the total TPAs (established and gazetted areas) in 1990 currency. Again calculations are provided in Appendix 5.2.

5.3.6 Soil Erosion and Water Catchment

The protection of these forest functions is achieved by monitoring logging activities and ensuring that logging companies comply with the Management and Forest Engineering Plans of the Sarawak Forest Department. Thus there are no additional definition and enforcement costs for these functions beyond those already discussed in Section 5.2.1 above, they will not be reiterated here.

5.3.7 Recreation and Tourism

The costs of defining and enforcing rules to control and protect forest recreation and tourism are incorporated in costs of the creation of National Parks and Wildlife Sanctuaries for the preservation of biodiversity. Hence, the costs in Section 5.2.5 are applicable for recreation and tourism.

5.4 Monetary Costs of Defining and Enforcing Rights to Enhance Overall Social Coordination⁶³

- Costs of Definition [Part c(i)]

Identifying Areas

Currently, about 60 percent cent of Sarawak's land is classified as Interior Area Land which is untitled and surveyed, and around one third of these lands belong to natives. In the mid-1980s, Interior Area Land comprised around 68 percent of the total area of

⁶³ Costs throughout this chapter are provided in the Malaysian currency, the Ringgit Malaysia. However, the US\$ equivalent of such costs will be furnished in Appendix 5.2.

Sarawak (Zaine, 1985). Some of these areas have been gazetted as Permanent Forest Estates, although ground surveys have not been undertaken by the Department of Land and Survey. A complete ground survey would remove all land ownership ambiguities present in Sarawak, and formally demarcate forested areas for their various functions. The Sarawak Forest Department intends to constitute a total of six million hectares of forests as PFEs.⁶⁴ Taking away areas that have been constituted by the Sarawak Forest Department, there remains around two million hectares out of this 6.0 million hectares of ungazetted forest areas that are yet to be constituted as PFEs. Besides the two million hectares of PFEs, there remains around 5.5 million hectares of unsurveyed non-PFE land.

Costs of surveying vary according to terrain accessibility. The cost of conducting a ground survey, as reported earlier in this chapter, is around RM 25 per hectare of land surveyed (including labour costs) in 1990 currency values.⁶⁵ In difficult terrain (slope of 35 degrees and greater classified as Class IV Terrain), this would increase by 80 percent making it RM 45 per hectare.⁶⁶ ITTO (1990) estimates that around 1.7 million hectares of land is in difficult terrain.⁶⁷

A ground survey to completely title all categories of land in Sarawak is yet to be undertaken. The constitution and issuance of formal titles to all forest land in Sarawak (including PFE and non-PFE areas) would cost RM 217.5 million in 1990 currency, consisting of RM 150 million (6,000,000 hectares \times RM 25) for surveying land in general terrain and RM 67.5 million (1,500,000 \times RM 45) for land in difficult terrain.

Costs of Measurement

As the discussion in the preceding subsections has shown, definition also includes measurement; in some cases, it is necessary to provide product inventories in addition to

⁶⁴Hitam and Wong, op. cit., p. 130.

⁶⁵O.R. Morningstar, and N.M. Knight, op. cit, Appendix 2.1.

⁶⁶ The estimate of 80 percent is derived from UNDP/FAO, *Forestry Development Project Sarawak, Planning and Cost Studies in Harvesting in the Mixed Dipterocarp Forest of Sarawak Part I: Based on Maps Derived from Ground Survey* (By H.M. Marn, Evert Vel and D.K.H. Chua, Field Document No. 7, FO: MAL/76/008), Kuching: Forest Department, August 1981, p. 3.

⁶⁷ International Tropical Timber Organization (ITTO), *Report Submitted to the International Tropical Timber Council by Mission Established Pursuant to Resolution I (VI) "The Promotion of Sustainable Forest Management: A Case Study in Sarawak, Malaysia"*, ITTC (VIII)/7, 7 May 1990, p. 44.

information on the size and location of the area. So far inventories have been mainly restricted to data on timber stands and stocks.⁶⁸ A thorough inventory of timber and non-timber products is necessary in PFEs as informal rights to native edible and non-edible products can exist in these areas. Such an exercise is necessary if the Sarawak Forest Department is to have accurate information on the types of timber and non-timber resources present in order to enforce legislation to protect native edible and non-edible forest products existing in PFEs. Timber inventories performed by the Forest Department cost RM 2.95 per hectare in 1990 currency.⁶⁹ This however does not include salaries paid to staff. Including wages, inventory costs are RM 6.55 per hectare.⁷⁰ Such a cost figure would probably be a conservative estimate, given that an inventory exercise covering a wider range of products would cost more. At RM 6.55 per hectare, a new inventory of Sarawak's PFEs for both timber and non-timber forest products (proposed and existing) would cost more than RM 39.30 million in total (RM 6.55 × 6,000,000 hectares) in 1990 values.

Costs of Enforcement [Part c(ii)]

Costs of Exclusion and Monitoring

After survey and demarcation, boundaries have to be maintained through some sort of 'fencing' or clearance where such areas are regularly cleared to enable boundary monitoring. This amounts to RM 4 million per year for the 4,100 km of boundaries maintained each year. Aerial and satellite surveys also have to be undertaken to monitor activities in these areas, followed by measures to halt illegal encroachments. Aerial surveys of monitoring forests in Sarawak cost RM 0.87 per hectare using 1980 prices and technology.⁷¹ A single aerial survey of all forested areas would cost RM 7.1 million.

⁶⁸ Hitam and Wong, op. cit., p. 132.

⁶⁹ *ibid.*, p. 133.

⁷⁰ This figure is estimated from the *Annual Report of the Forest Department Sarawak 1993*, p. 105, in terms of Total Personal Emoluments/Area of Permanent Forest Estate in hectares.

⁷¹ UNDP/FAO, *Forestry Development Project Sarawak, Planning and Cost Studies in Harvesting in the Mixed Dipterocarp Forest of Sarawak Part II: Based on Maps Derived from Available Air Photographs* (By Harald Mattsson Marn, Evert Vel and Danny Chua Kee Hui, Field Document No. 7, FO: MAL/76/008), Kuching: Forest Department, September 1981, p. 29.

However, using more recent cost data from Peninsula Malaysia,⁷² it has been estimated that the cost of aerial photography (scale of 1:25,000-1:40,000) amounts to RM 239.00 per thousand hectares in 1989 currency. For SPOT satellite imagery (scale of 1:400,000), costs amount to RM 39.45 per thousand hectares, and for LANDSTAT satellite imagery (scale of 1:1,000,000), costs sum up to RM 3.31 per thousand hectares.⁷³ Applying these figures to Sarawak, a survey of forested areas (PFEs and TPAs inclusive of proposed areas) cost RM 1.67 million for aerial photography ($0.239 \times (6.0 \text{ million hectares of PFEs and } 1 \text{ million hectares of TPAs})$), RM 276,150 for SPOT and RM 23,179 for LANDSTAT satellite imagery, all in 1989 currency.

Satellite imagery cannot be used as a stand-alone method for monitoring forests; aerial photography has to be undertaken first in order to provide a comprehensive picture of forest conditions and of its status. This is because clouds, haze and cloud shadows prevalent in Sarawak and Peninsula Malaysia often result in poor quality satellite data. However, both satellite imagery methods are cost-effective and they can provide reasonably reliable, current, and extensive information on an on-going basis for roads, skid trails, rivers, abandoned land, bare soil, and other geographical features, once aerial surveys have been conducted; in this way, regular monitoring of land use is possible⁷⁴ to prevent, for example, new intrusion into PFEs by shifting cultivators.

Costs of Supervision/Penalising

In terms of supervision, ITTO (1994c) calculated that to allow for management to inspect logging operations on an on-going basis (instead of pre- and post- logging operations as currently undertaken), and for three inspections per week (instead of weekly inspections), a total of at least 202 'man years' are required.⁷⁵ During the period under study, most of the

⁷² W.Y Wan Ahmad, "Satellite Imagery for Forest Resources Monitoring and Management in Peninsular Malaysia", Paper Presented at the Persidangan Perhutanan Malaysia Kesepuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989, p.9.

⁷³ *ibid.* These costs include labour costs for satellite imagery interpretation, transfer of information and data onto base maps, broad forest types stratification, field work and ground truthing (validation of data), broad forest types classification in the final image classification, map proof preparation and reproduction; transportation costs, and stationery costs.

⁷⁴ *ibid.*, p. 3.

⁷⁵ Number of staff needed for one year of supervision. For Permanent Forest Estates, this involves three inspections per week, and for Stateland Forests, inspections of one per week under the "sustainable management" criteria set by ITTO. See ITTO (1994c), *op. cit.*, p. 20 and p S3-86. ITTO (1994c) defines

time and effort by field staff has been devoted towards eliminating royalty evasion.⁷⁶ With a higher frequency of inspections for steeplands (daily for steep terrain in hill forests and twice weekly for moderate terrain in hill forests), a total of 255 "man years" is required.⁷⁷ This figure is calculated on the basis that forests are managed to minimise destructive logging, minimise damage to streams, water courses, soils, wildlife and wildlife habitats, non-wood forest products, and to ensure that the interests of forest dependent communities and industries are not overlooked. This would therefore take into consideration non-timber concerns in logging areas. The essence of the ITTO (1994c) strategy is the prevention, and not the correction, of breaches.⁷⁸ Using data from this source and the Sarawak Forest Department, forest supervision costs range from RM 2.42 million to RM 3.06 million in 1990 currency, adding an additional eleven to fifteen percent to existing expenditure on staffing.

- *Total Costs of Defining and Enforcing Property Rights [Parts c(i) and c(ii)]*

A breakdown of specification costs for enhancing social coordination is provided in Appendix 5.2. Together with the daily monitoring of TPAs (Scenario 1 of Appendix 5.2), the total costs of social coordination (including land surveying and inventories) is 8.82 times the 1990 Forest Department budget of RM 22.92 million for the first year,⁷⁹ and 6.79 times every year thereafter from the second to tenth year. Twice weekly monitoring of TPAs would amount to 3.93 times the 1990 budget for the first year, and 1.9 times annually thereafter (Scenario 2 of Appendix 5.2). In terms of total departmental expenditure figures, it is hard to justify such increases in expenditure by the Sarawak Forest Department or by the state government for improving social coordination in Sarawak's forests, in view of the emphasis of the Federal Government during the period on

sustainable forest management as one which should leave the forest ecosystem almost intact and capable of quick recovery. In addition, there should be no irreversible damage to the forest structure, the forest environment, streams, watercourses, soils, wildlife and their habitats, non-wood forest products, the residual stand and to local and downstream forest dependent communities and industries. Finally parts of forests opened by the felling of trees and removal of logs should be regenerated. See *ibid.*, p. ii.

⁷⁶ *ibid.*, p. 32.

⁷⁷ *ibid.*, p. S4-87. For Permanent Forest Estates; one inspection per week for swamp forests, two inspections per week for moderate terrain hill forests, and daily inspections for steep terrain hill forests. In State land Forests; one inspection per week for swamp and moderate terrain hill forests and two inspections per week for steep terrain hill forests.

⁷⁸ *ibid.*, p. 20.

cutting back the size of the public sector (ITTO, 1994c). These additional costs would also impinge on the revenue and profits of the Sarawak Forest Department and timber interests, with benefits from respecification flowing to individuals who do not directly contribute to these costs. However, if costs are compared to the total Forest Department revenues (royalties and taxes) derived from timber, then there are grounds for justifying increases in expenditure for specifying property rights. As the discussion in Chapter Four has indicated, rights have not been fully specified by the state.

Comparing timber revenues with the costs of social coordination, it can be seen that total revenues generated from logging (consisting mainly of royalties and permits from timber) are more than enough to cover the total costs of definition and enforcement of forest property rights throughout a 25 year timber felling cycle.⁸⁰ This is illustrated in tables 5.1 and 5.2 below. Table 5.1 assumes daily monitoring of Totally Protected Areas, while Table 5.2 assumes twice weekly monitoring; hence the costs of property rights definition and enforcement are lower in Table 5.2. The assumptions and calculations used to derive the costs in Tables 5.1 and 5.2 are set out in Sections 1 and 2 respectively of Appendix 5.2.

Tables 5.1 and 5.2 show that government timber revenues exceed rights definition and enforcement costs in every year of the 25 year felling cycle; this is so even in the first year of the cycle, which includes a once-only inventory of timber and biodiversity in all forested areas in Sarawak.

⁷⁹ This excludes Development and Special Expenditures of the Sarawak Forest Department.

⁸⁰ The average number of hectares of forests harvested per year was close to 400,000 hectares for the years 1991-1995. In the same period, the average Total Forest Revenues per year was about RM 800 million. Costs of defining and enforcing property rights in forested areas cover all forested areas in Sarawak, including areas which are being logged. This represents total government expenditure on the definition and enforcement of property rights. From the second and subsequent harvest cycles of 25 years each (26th to 50th year, and 51st to 75th year and so on and so forth), the costs of coordination will even be lower as the costs of ground surveying and inventories need not be carried out any longer.

Table 5.1: Costs of Social Coordination Under Scenario 1

	Year(s)	Timber Revenues (RM million) (1)	Costs of Social Coordination (RM million) (2)	(1) - (2)
Scenario 1 and Year 1: Refer to Section 1.1 of Appendix 5.2 for the costs of social coordination in Year 1.	1	800	216.64	583.36
Scenario 1 and Years 2 to 10: Refer to Section 1.2 of Appendix 5.2 for the costs of social coordination in Years 2 to 10.	2-10	800	170.1	629.9
Scenario 1 and Years 11 to 25: Refer to Section 1.3 of Appendix 5.2 for the costs of social coordination in Years 11 to 25.	11-25	800	14.99	785.01

Table 5.2: Costs of Social Coordination Under Scenario 2

	Year(s)	Timber Revenues (RM million) (1)	Costs of Social Coordination (RM million) (2)	(1) - (2)
Scenario 2 and Year 1: Refer to Section 2.1 of Appendix 5.2 for the costs of social coordination in Year 1.	1	800	90.21	709.79
Scenario 2 and Years 2 to 10: Refer to Section 2.2 of Appendix 5.2 for the costs of social coordination in Years 2 to 10.	2-10	800	43.7	756.3
Scenario 2 and Years 11 to 25: Refer to Section 2.3 of Appendix 5.2 for the costs of social coordination in Years 11 to 25.	11-25	800	2.34	797.66

The calculations above assume that timber production and revenues remain unchanged, and do not allow for any changes in timber production and resulting revenues arising from more precise definition and enforcement of forest property rights. However the assumptions of no change in production and revenues do not significantly affect the economic feasibility of increased rights specification expenditures, due to the large differences between government revenues and costs. Also, the rate of harvesting during the period of study, which averaged close to 400,000 hectares per year in 1991 to 1995, is not sustainable,⁸¹ given that Sarawak has only 8.0 million hectares of forests which is insufficient to maintain a 25 year harvesting cycle. A reduction in the total hectareage harvested is likely to occur, and will affect future production and revenues. The calculations assume, however, that there will be no change in areas harvested. Even assuming a reduction in the timber harvest to a sustainable level (320,000 hectares),⁸² which effectively reduces revenues by twenty percent, revenues still cover the costs of social coordination.

The calculations in Tables 5.1 and 5.2 also assume that forest inventories undertaken in the first year may not have to be repeated in subsequent harvesting, which lowers the subsequent costs of social coordination. The calculations in Tables 5.1 and 5.2 are not intended as a precise assessment of the social benefits and costs of more precise rights specification, they aim to show that more precise rights specification is feasible in a budgetary sense.

What if the assumption that increased property rights specification does not affect revenue is dropped? If timber revenues (royalties and taxes) collected by the Sarawak Forest Department rise as a result of increased specification, additional specification is justified if the additional revenue collected at least covers the additional costs of defining and enforcing property rights.

As a result of the recommendations of the ITTO mission (ITTO, 1990), there was a deliberate attempt by the Sarawak government after 1992 to increase the level of staffing

⁸¹ Maintaining the same rate of harvesting year after year.

⁸² 8 million hectares divided by 25 years.

for enforcing forest property rights in line with the ITTO recommendations.⁸³ The Total Recurrent Expenditure and Total Revenue data in the *Annual Reports of the Sarawak Forest Department* after 1992 can therefore be used to determine the impact of increased property rights specification on revenues.⁸⁴ Since most of the Forest Department's recurrent expenditures are staff expenditures, the Annual Recurrent Expenditure figures presented in Table 5.3 provide a fairly accurate measure of the Department's additional labour costs during the years 1992 to 1995.⁸⁵ They therefore serve as a measure of changes in the level of definition and enforcement activities. The Timber Revenue figures in Table 5.3 are mainly royalties and taxes collected on the basis of volume of timber harvested each year.

Table 5.3: Total Recurrent Expenditure and Timber Revenues in Response to Changes in Specification Activities (Market Value)

Year	Annual Recurrent Expenditure ('000 RM) (a)	% Change in Annual Recurrent Expenditure	Timber Revenue ('000 RM) (b)	% Change in Total Revenue	Timber Output ('000 m ³) (c)	Timber Revenue/ Timber Output Ratio (b/c)
1990	29,695	-	734,832	-	18,854	38.97
1991	31,788	7.0 (90/91)	693,364	5.6	19,435	35.68
1992	35,555	11.9 (91/92)	709,704	2.4	18,866	37.61
1993	39,620	11.4 (92/93)	726,000	2.3	16,758	43.32
1994	42,524	7.32 (93/94)	864,382	19.1	16,337	52.90
1995	50,288	18.2 (94/95)	996,603	15.3	16,105	61.88

Source: *Annual Report of the Forest Department (Various Years), Sarawak; Annual Report (Various Years), Bank Negara Malaysia; Kok (1994).*

⁸³ Chapters Three and Six of this thesis discuss the recommendations made by the ITTO.

⁸⁴ It should be noted that the increase in staffing from 1992 is chiefly related to one particular aspect of rights specification, monitoring and enforcing forest property rights to ensure proper timber harvesting practices, prevention of illegal logging, and prevention of evasion of royalty payments. Land surveying and inventorying activities were not increased.

⁸⁵ Statement by the Chief Minister of Sarawak, Malaysia, Rt. Hon. Datuk Patinggi Tan Sri Haji Abdul Mahmud at the Opening Ceremony of the 13th Session of the International Tropical Timber Council, Yokohama, Japan, 16-21 November 1992. Data in the *Annual Reports of the Forest Department, Sarawak*, do not reflect an increase in staff numbers until 1995 because most new staff were recruited on a temporary payroll between 1992 to 1994. It was only in 1995, that a dramatic increase in staff numbers is recorded in the Sarawak Forest Department's Annual Report as such staff were included in the permanent payroll. However, recurrent expenditure did increase in 1992 to reflect the increase in labour costs.

From table 5.3, it can be seen that annual staffing increases from 1992 to 1995 (indicated by increases in the total recurrent expenditure) have been accompanied by increases in timber revenues (see columns 4 and 5 in Table 5.3). Timber revenues increased an average 12.21 percent per year from 1992 to 1995, and the revenue to output ratio (column 7) increased from 37.61 to 61.88 from 1992 to 1995. This suggests that the efficiency of timber revenue collection increased during these years when specification activities became more intense.

Focussing on year-to-year changes, Table 5.4 compares annual changes in timber revenues and recurrent expenditures for the period 1990 to 1995.

Table 5.4: Costs and Returns to Better Specification of Property Rights

Year	Annual Recurrent Expenditure ('000 RM) (a)	Timber Revenue ('000 RM) (b)	Change in Timber Revenue (Δb)/ Change Recurrent Expend. (Δa)
1991	31,788	693,364	1990/1991: -
1992	35,555	709,704	1991/1992: 4.34
1993	39,620	726,000	1992/1993: 4.00
1994	42,524	864,382	1993/1994: 47.65
1995	50,288	996,603	1994/1995: 17.03

Source: As for Table 5.3.

Assuming that changes in the annual recurrent expenditure of the Sarawak Forest Department between 1990 and 1995 are a reasonable proxy for concurrent changes in specification activities, Table 5.4 suggests that the return to the better specification of property rights in Sarawak forests between 1992 to 1995 was highly positive. Averaging out the revenue and expenditures figures over a three year interval (1993-1995/1990-1992) to reduce year-to-year fluctuations,⁸⁶ the return to better specification ($\Delta b/\Delta a$) is

⁸⁶ Average timber revenue for the years was RM862,328 (1993-1995), and RM712,483 (1990-1992). Average recurrent expenditure over the same period was RM44,144 and RM30,087 respectively.

10.66. It is very important to note that the specification of rights to non-commercial forest functions will have impacts that are not measurable in terms of government revenue collection. Better specification of such non-commercial rights is not considered here.⁸⁷

More precise estimates of the marginal return to better specification of property rights in Sarawak's forests would require time- and location-specific data on Forest Department staff numbers and activities and revenues collected. Such data was not available for this study. Data on court prosecutions and penalties by years and by districts would also help to indicate changes in property rights specification. Court data were not used here because currently available information is too imprecise to be of value. Comparable data on specification expenditures and timber revenues from Sabah and peninsular Malaysia would also be useful for estimating the returns to better rights specification.

The above calculations support the argument in this chapter that the monetary costs of better specification of property rights are modest in relation to both total timber revenues and the increase in revenues due to better rights enforcement. Thus, there are clear public finance grounds for further increases in the specification of forest property rights in Sarawak, in particular the monitoring and enforcement of property rights related to timber harvesting operations, as actually undertaken by the Sarawak Forest Department from 1992 onwards.

A study of timber rent capture by Vincent (1990) highlights the potential for raising Malaysian governments' timber revenues. Vincent argues that limited timber royalty rates in Malaysia have given an inaccurate indication of the potential government financial returns to better forest management. Using an estimated marginal cost of logging as a basis for calculation of timber rents, Vincent provides estimates of the extent of rent capture by the forest departments and concessionaires and loggers in peninsular Malaysia, Sabah, and Sarawak from 1966 to 1985.

⁸⁷ Rights specification activities such as increased land surveying will add to expenditure but will not yield revenue returns comparable to activities like that of monitoring and enforcement of timber harvesting for preventing royalty evasion and illegal logging.

⁸⁸ This is especially so given that the level of staffing to enforce the collection of royalties and taxes were at a bare minimum prior to 1992. It is therefore likely that returns to increased specification would be positive given this scenario.

Vincent notes that Sarawak royalty rates during that period have been "set administratively and updated infrequently."⁸⁹ His estimates of rent capture are provided in Table 5.5.

Table 5.5: Timber Rent Capture in Malaysia (Billion RM)

Region	Government Revenue	% of Potential Rent	Windfall Profit	% of Potential Rent	Potential Rent
Peninsular Malaysia	2.41	21.84	8.59	77.87	11.03
Sabah	8.19	46.21	8.80	49.66	17.71
Sarawak	1.34	18.38	5.92	81.2	7.29

Source: Adapted from Vincent (1990).⁹⁰

Notes:

Potential rent = Government Revenue + Windfall Profits

In the above table, Vincent assumes a baseline elasticity estimate of 3 for the elasticity of marginal cost of logging, β^b , which follows a similar but earlier study on Southeast Asia)⁹¹ Vincent's estimations are for 1966-1985, in real terms of 1980 price levels. RM 1.00 = US\$ 0.46 in 1980.⁹²

Vincent estimates that only 18.38 percent of the resource rent in Sarawak is captured by the state, with 81.2 percent accruing to concessionaires and loggers. Sarawak has the lowest rent capture rate among the three areas, with Sabah having the highest. Vincent cautions that biases exist when arriving at these estimates, as detailed time series data on harvesting costs are meagre. He uses a marginal cost function to extrapolate the limited harvesting cost data available.⁹³ Thus there may be some under- or over-estimation of the high rates of rent capture by timber operators. In spite of this limitation, Vincent's study points to the potential for increasing timber revenues through a higher royalty and tax

⁸⁹ J.R. Vincent, "Rent Capture and the Feasibility of Tropical Forest Management", *Land Economics* 66, No. 2 (May 1990), p. 213. Royalty rates have also remained more or less the same to 1995, the period covered in this thesis.

⁹⁰ Vincent (1990) includes another component, high grading (HG), in estimating the resource rent of timber harvesting. High grading is carried out when certain species of trees are left unfelled to avoid the unnecessary of royalties and taxes. This component's contribution is miniscule and can therefore be safely removed for the purposes of the discussion here.

⁹¹ *ibid.*, p. 221.

⁹² See *ibid.*, p. 217.

⁹³ *ibid.*, p. 216.

structure in Sarawak, which, in turn, supports better property rights specification in order to realise such increased revenues.

Following Vincent's example, Table 5.6 presents estimates of the economic rents captured by concessionaires and loggers in Sarawak between 1990 and 1995. These estimates are rudimentary, in the sense that the harvesting costs used (column 6 of Table 5.6) are taken from a single figure provided by the ITTO (1994b).⁹⁵ In spite of these limitations, the results suggest that there is potential for timber revenues (royalties and taxes) to be increased to finance additional rights specification activities; the percentage of economic rents accruing to concessionaires and loggers averages 46 percent for the years 1990-1995.

Table 5.5: Economic Rent of Timber Harvesting (1990-1995)

Year	Timber Output ('000 m ³) (a)	Timber Revenue ('000 RM) (b)	Average Price of Sawlogs (RM/m ³) (c)	Value of Timber Output ('000 RM) (a*c)	Cost of Harvesting (RM/m ³) [RM 131.48]*a ('000 RM)	Economic Rent [#] (%)
1990	18,854	734,832	198.5	3,742,519	2,478,924	33.3
1991	19,435	693,364	212.2	4,124,107	2,555,314	38.0
1992	18,866	709,704	211.1	3,982,613	2,480,502	37.7
1993	16,758	726,000	315.0	5,278,770	2,203,341	58.3
1994	16,337	864,382	302.0	4,933,774	2,147,999	56.5
1995	16,105	996,603	292.0	4,702,660	2,117,485	55.0

Economic Rent accruing to concessionaires is calculated by the following method: [Value of Timber Output (a*c)] minus [Cost of Harvesting].

Source: As for Table 5.3. and ITTO (1994a).

⁹⁴ Rents are calculated by deducting harvesting costs from the price received for timber which can be represented by the following, $s_i = v_i(p_i - c_i)$, where i is the index for individual trees, s is the resource rent, v is the volume of timber extracted, p is the price received for timber, and c is the extraction cost. Resource rent for timber is also known as stumpage value. Vincent, op. cit., p. 214.

⁹⁵ Actual harvesting costs may be much lower than this stated cost, especially when concessionaires are known to "cut corners" due to minimal enforcement on the ground during the period under study. The harvesting cost of RM 131.48 in Sarawak is based on estimations calculated in 1991 when enforcement was minimal. Further research is necessary to determine more realistic and site specific harvesting costs.

⁹⁶ *ibid.*, p. 217.

5.5 Discussion and Summary

Appendix 5.2 summarises the estimated costs of better forest property rights specification in Sarawak forests and compares them to the monetary and non-monetary benefits of better specification. The costs of better specification of rights to the various forest functions are not significant if compared to the total revenue (royalties and taxes) received from timber of over RM 700 million annually in the early 1990s, increasing to more than RM 800 million by the mid 1990s. Assuming that Scenario 2 of Appendix 5.2 is adopted, total recurrent costs would amount to only twelve percent of total timber revenues in the first year and six percent in subsequent years; not a high cost for enhancing social coordination.

If the costs of better rights specification are compared to the annual Total Recurrent Expenditure of the Sarawak Forest Department, they amount to 2.9 times the Total Recurrent Expenditure in the first year and 1.4 times in subsequent years. However, it should be noted that the Total Annual Recurrent Expenditure of the Department comprises 5.4 percent of Total Revenues collected. Thus there appears to be strong justification for increasing forest management expenditure to better specify forest property rights. This is supported by the 25 year felling cycle comparisons of government cash inflows (timber revenues) and outflows (costs of better rights specification) set out in Tables 5.1 and 5.2. On the other hand, the public choice arguments discussed in Section 2.4 suggest that government action to respecify property rights may be dependent on the subsequent expected or real distribution of benefits and costs after a respecification of rights; prospects of large individual gains from timber rents may provide strong motivation for interest groups to lobby for favourable changes in forest property rights, and for politicians and bureaucrats to supply such rights changes.

Note that some of the calculations in Appendix 5.2 are based on data from sources in Peninsular Malaysia and elsewhere. As such, they should not be taken to be entirely reflective of the situation in Sarawak; for example, there are likely to be some differences in timber transport and wage costs. Such limitations should be borne in mind. Remember that the aim of this chapter was not so much to estimate the benefits of social coordination, but rather to present information on the costs of social coordination in the use of forests in

Sarawak, and to question the importance of this factor in hindering the specification of property rights.

The results of increased enforcement of forest property rights by the Sarawak government after 1992, in line with the ITTO recommendations, further substantiates the case for increasing property rights specification activities in Sarawak. An increase in spending to better enforce property rights was accompanied by an increase in the ratio of timber revenue to timber output (Table 5.3). The low proportion of economic rent captured by the state of Sarawak (Tables 5.5 and 5.6) further weakens support for the second hypothesis of this thesis, that better definition and enforcement of forest property rights is too costly relative to its benefits. This leads to consideration of hypothesis three, involving an examination of the political costs and benefits of property rights definition and enforcement, in Chapter Six.

Chapter 6

Political Barriers to Social Coordination: Public Choice Issues in Defining and Enforcing Property Rights

6.1 Public Choice Issues in the Definition and Enforcement of Property Rights

Chapter Four has shown that the definition of rights tended to favour the creation of forested areas for timber and the extraction of timber at the expense of non-timber functions, while enforcement was lacking to ensure that timber operators adhere to regulations to protect food-producing, environmental, and ecological functions of forests. Chapter Five in turn has shown that the costs of enforcing rights to timber harvesting practices were not prohibitive compared to timber revenues collected each year. Yet such rights have not been adequately enforced. This requires an examination of the political barriers faced by politicians and bureaucrats in specifying rights, following part d of the analytical framework in Section 2.6 of Chapter Two, and hypothesis three in this thesis.

The outline of this chapter is as follows. Section 6.2 reiterates the relevant parts of the analytical framework in Section 2.6 dealing with the political barriers present in defining and enforcing forest rights. Sections 6.3 and 6.4 of this chapter deal with the demand side of property rights respecification, while sections 6.5 and 6.6 deal with the supply side. Section 6.7 examines how spatial distribution and the excludability of benefits affect the supply of property rights. Section 6.8 concludes by using the examples of native burial grounds and timber to illustrate public choice forces affecting the demand and supply of property rights.

6.2 The Demand and Supply of Property Rights

The sections below examine the political barriers present in defining and enforcing property rights in forests. This involves examining the likely outcome of institutional change using a demand and supply scenario first discussed in Section 2.6. The information and incentives faced by demanders and suppliers are crucial for explaining the outcome in property rights specification, with the intrinsic characteristics of forest functions (non

excludability and spatial distribution of benefits) affecting both the strength of demand and supply in this model, as the following discussion will show.

From the demand side:

Motivation for Collective Action [Part d(i) of the Analytical Framework]

Interest groups are motivated to demand changes in the existing *status quo* when there is an increase in the expected benefits that can be captured from a modification of the existing property rights specification. Hence, collective action is spurred and action galvanised when there are changes (increases) in the value of a forest function (Libecap, 1989). This will be discussed in Section 6.3.

Collective Action and the Strength of Demand [Part d(ii) of the Analytical Framework]

Individuals with similar concerns organise themselves into groups or organisations representing their interests in order to effectively and collectively lobby for a respecification of property rights in line with their interests.

The strength of demand (lobbying) for a respecification of rights by an interest group discussed in Section 6.4 is likely to be affected by one or more of the following factors: the size of an organisation, its wealth, network of links with other groups, number of years established, leadership skills, and the concentration of benefits within the group. Size provides more leverage (political or otherwise) in affecting popular support, wealth and network of links with other groups more resources for lobbying, and the number of years established and capable leadership skills lowers operational costs (more adept political lobbying skills due to familiarity with governmental procedures, and capable leadership improves lobbying skills) in demanding a respecification of property rights.

Concentration of benefits to particular individuals within a group helps to overcome inertia and free riding. Demand is diluted when individual beneficiaries choose to free ride on the

efforts of the rest of the group. Spatial distribution also affects demand. Benefits that are widely dispersed increase the cost of coordination for the group.

From the supply side:

Objective Function of Politicians and Bureaucrats [Part d(iii) of the Analytical Framework]

Politicians (and bureaucrats) define and/or enforce rights in a manner that maximises their objectives of staying in power or of maximising support, as discussed in Sections 6.5 and 6.6. Thus the information obtained by and incentives faced by politicians and bureaucrats are crucial in determining the supply of property rights specification.

In the case of politicians, the supply of timber rights to favour political allies and supporters (to safeguard profit earnings of timber operations) generates loyalty which translates into the objective of maximising political support. Apart from profits, the importance of timber revenues (royalties and taxes) for establishing commercial agricultural schemes, diversifying the economy and generating new employment opportunities and so on is also important as this translates into popular political support (votes). Both profits and timber revenues¹ play an important part in meeting these objectives and in maintaining and enhancing political support.² Nevertheless, politicians also have to consider non-timber benefits to the extent that ignorance of such concerns may result in a reduction of popular support (votes), or reduction of timber revenues and profits (via timber bans imposed by developed countries due to negative publicity generated by interest groups) which then impact on political objectives. The role of politicians in the supply of property rights specification is examined in Section 6.5.

¹ It is important to note that earning more profits means lesser revenues (royalties and taxes) for the state, although both ends serve to achieve the objective of politicians. Empirical studies on Sarawak indicate that politicians tend towards maximising profits. Vincent reports that Sarawak's royalty system undervalues timber and revising the royalty system would enhance government revenue collection, hence transferring wealth from the private concessionaires to the public sector. See J.R. Vincent, J.R., "Rent Capture and the Feasibility of Tropical Forest Management", *Land Economics* 66, No. 2 (May 1990), pp. 216-220.

² See, for example, Colchester, 1989; Dauvergne, 1997; and King, 1993 who discuss in detail the role of timber in maintaining the political support base of the ruling party in Sarawak. This will be discussed in greater detail in Section 6.5.

The interests of bureaucrats do not entirely converge with those of politicians. Rights will be enforced to the extent that the bureaucratic objective function of increasing its administrative size (budgetary allocation, staff size, and turf) is enhanced. This may run contrary to the objectives of the federal and state governments which aim to cut and not expand the public sector in Malaysia. Maximising timber revenues (royalties and taxes) would rank highly in the Sarawak Forest Department's agenda, as this would enable the above objective function to be maximised. In line with maximising their objective function, bureaucrats consider the concerns of the non-timber interest groups to the extent that negative reaction from such groups can affect the Department's revenue. For example, native resistance, such as blockades, may affect timber outputs and hence the revenue collection function of the Forest Department. Section 6.6 examines the role of bureaucrats in the supply of property rights.

- *Spatial Distribution and Excludability*

The spatial distribution and excludability of the benefits from a forest function influences the incentives of politicians and bureaucrats to specify rights for forest functions. The impact of spatial distribution and excludability on the supply of property rights by politicians and bureaucrats is discussed in Section 6.7.

Spatial Distribution and Supply: The spatial incidence of benefits determines if beneficiaries are local, regional, or global which in turn determines the sources of pressure from interest groups which are concerned with particular forest functions and benefits. For example, it would matter less to the Sarawak government if beneficiaries were non-voters living in distant countries than if they were local native communities who are able to shift their support to other political parties if their demands remain unmet. To the extent that these pressures affect the objectives of politicians and bureaucrats, native communities will have more effect on property rights respecification than non-voters living overseas.

Excludability and Supply: Forest functions which provide direct and excludable benefits which impact directly on political and bureaucratic objectives will be afforded a higher priority than non-excludable benefits which are widely spread and non-commercial. For example, benefits from timber in the form of timber profits, and forest department

revenues will be accorded a higher priority than benefits from preventing soil erosion and biodiversity loss which are mostly non-excludable.

6.3 Shifts in the Value of Forest Functions [Part d(i)]

What are the factors that have motivated action by interest groups to demand changes in the definition and enforcement of rights to forest functions? Prior to the emergence of the timber industry, the *status quo* or equilibrium in property rights of the various forest functions had more or less been maintained as there was little or no impact on forest use by any particular interest group. However, price increases in timber together with the depletion of timber resources in Peninsular Malaysia disturbed this equilibrium in Sarawak.

The price of timber increased significantly between the 1970s and 1980s. In real terms, the price of sawn logs in Malaysia increased from an average of RM 93.7 in the 1970s to RM 169.83 in the 1980s and RM 234.2 in the 1990s.³ Between 1993 and 1995, average prices were in excess of RM 300 per m³. Also, since the early 1980s, timber supplies from Peninsular Malaysia have become scarce due to overharvesting,⁴ with Sabah and Sarawak logs compensating for this shortfall. Sarawak supplied an average of 45 per cent of the total Malaysian output of logs from 1990 to 1994.⁵ This compares to an average of 20 per cent in the 1970s and early 1980s.⁶ The areas of forests logged in Sarawak increased from an average of 115,417 ha per year in the 1970s to an average of 294,343 ha per year in the 1980s (2.5 fold increase) to 389,162 ha in the 1990s. Appendix 6.1 provides estimates of areas logged per year, and the extent of forest harvesting from the 1960s to 1995.

Increased logging activity induced by price increases in timber has in turn impacted on the social (native customary rights in shifting cultivation, collection of edible and non-edible

³ Calculated from S.K. Kok, *Malaysia to 2003: From Redistribution to Growth*. United Kingdom: The Economist Intelligence Unit, 1994, p. 52.

⁴ Hong, op. cit., pp. 124-127.

⁵ Obtained from the World Wide Web, "Production of Logs ('000 Cubic Meters)", http://www.mtc.com.my/fpub/statistic/stat94/tb8_694.htm on 14 January 1997.

⁶ Calculated from Table 4 in Hong, op. cit., p. 126.

forest products, burial areas),⁷ environmental and ecological (biodiversity, soil erosion, water pollution) functions provided by Sarawak's forests. Non-timber forest functions have become scarcer and hence relatively more "valuable" because of increased logging. In line with part d(i), the expected benefits from demanding that rights be respecified to protect both timber and non-timber forest functions have increased due to an increasing scarcity of these functions. In other words, incentives for affected groups to organise collective action to change the specification of rights to protect these functions are now greater because of higher expected gains.

6.4 Forest Interest Groups, Strength of Demand, and Likely Influence on the Specification of Property Rights [Part d(ii)]

The following factors, one or more, account for the strength of demand exerted by interest groups on politicians and bureaucrats for a respecification of property rights. Factors like size, wealth, network of links with other groups, familiarity with local conditions (number of years established), leadership skills, and the concentration of benefits within the group (monetary and non-monetary benefits like prestige, friendship, and respect) influenced the strength of demand by a group, and hence the consequent success of collective action by each group.

Sections 6.4.1 to 6.4.5 in this chapter will analyse interest groups under the umbrella of organisations. In the case of Sarawak, individuals, groups, and countries (in the case of ITTO) formed or joined existing organisations to safeguard, or to further their concerns for

⁷ Increasing population pressure also impacted on forested areas and its availability for native needs (for example, fallow periods have to be reduced to cope with greater demands for rice). However, it was the widespread and intensive logging of forests during the 1980s and 1990s which significantly reduced the availability of forested areas and made non-timber forest functions scarcer and more valuable. Please see Appendix 6.1 for areas of forests logged each year.

a particular forest function. Organisations, established prior to the late 1980s when massive logging occurred, served as a ready avenue for concerted and significant representation of concerns about forest functions. The importance of interest groups is in line with views expressed in the VPE school of thought and Libecap (1989), who point out that such groups exercise significant discretionary power in influencing decision making.

That the different forest functions have not been entirely overlooked in social coordination, testifies to the 'success' of these groups, in varying degrees, in representing individuals concerned for the different forest functions. Some of these groups exist outside Sarawak. ITTO and WWF concerns are with forest function benefits which transcend local boundaries. Individuals and groups (officials, civil servants, foresters and specialists in biological and social sciences disciplines from member countries for ITTO; individual biologists, scientists, academics, education officers, lawyers, administrators, professionals for WWF) join these groups on the basis that their interests in tropical forests are reflected by these organisations. The ITTO and WWF⁸ work through official channels to make demands on politicians and bureaucrats. In particular, their research publications, disseminated to officials and the public, exert major influence on property rights specification.

SAM which consists of lawyers, business people, academics and professionals, is partly local but has wider links to Peninsula Malaysia and internationally.⁹ SAM acts to disseminate information about environmental and native concerns to the international media, with assistance provided by their international counterparts. SAM also disseminates its research findings locally and internationally, again with assistance from its foreign allies. SAM also assists the various native groups to organise blockades. Native groups, on the other hand, present their demands either through political lobbying or blockades, in many cases with assistance by SAM, as was the case in the events of 1987. Native groups have also sent letters, resolutions, and declarations to state and federal

⁸ The structure of ITTO and WWF as interest groups is discussed in detail in Section 6.4.4 and 6.4.5 respectively. Unlike the other interest groups in Sarawak which consist of individuals, ITTO's membership consists of timber producing and consuming countries from around the world.

⁹ The structure of SAM is discussed in detail in Section 6.4.2.

governments presenting their concerns.¹⁰ The STA, representing the concessionaires, contractors, and sub-contractors who have close connections to politicians lobbies in a rather 'quiet' manner due to the already existing links between major beneficiaries and politicians.

Thus in Sarawak, concessionaires and logging companies operate under the umbrella of the STA, environmentalists under SAM, conservationists under WWF, native groups under the various native organisations, and forest specialists and forest officials concerned with trade and the sustainable forest management under ITTO.

Discussion in the following sections 6.4.1 to 6.4.5 is organised as follows: first, beneficiaries in each interest group and their particular concerns are identified. Second, the motivation for collective action in terms of shifts in resource values (part d(i)) is discussed for each interest group together with other factors which could have also galvanised collective action. Finally, the various factors that influence the vigour or strength of demand coming from an interest group (part d(ii)) are examined.

6.4.1 Sarawak Timber Association (STA): Commercial Timber and Logging Functions

- Identifying Beneficiaries

Commercial timber interests act collectively under the umbrella of the STA, formed in 1971. STA, a group interested in the timber function of forests, consists of concessionaires (some of whom are politicians), logging companies (contractors and sub-contractors); and individuals involved in logging, the timber trade, and the timber processing industry. These beneficiaries (totalling around five hundred members) make fixed contributions to the association based on their category of involvement. The STA was formed to promote the Sarawakian timber industry, and works closely with the Sarawak Forest Department and the state government to monitor world markets for tropical timber products, to provide information and facts for public understanding of the timber trade and industry, and to

¹⁰ Native groups and their collective organisation are discussed in Section 6.4.3.

represent its members' interests domestically and internationally. It would be reasonable to assume that although the STA represents a spectrum of timber beneficiaries, it is the concerns of concessionaire and contractors that drive collective action from this group, as they are the major beneficiaries of timber operations.¹¹

- Shifts in Value [Part d(i)]

Increases in the price of timber and the rising scarcity of timber in Peninsular Malaysia presented a potential for massive gains to be obtained from timber extraction in Sarawak during the 1980s and early 1990s. Increases in the value of timber have been discussed in Section 6.3 and also Appendix 3.2. As discussed in Chapter Three, profits derived from timber have been lucrative. The monetary and excludable benefits from timber are factors that have motivated individuals within the STA to lobby for a specification of rights to favour logging, especially concessionaires and contractors who gain a large share of these benefits. In terms of profits, this would probably be in the domain of RM 21,000 per ha per harvest in 1990 prices as calculated from table 6.1.

Table 6.1: Average Profits from Logging Operations in the 1990s

Gross Receipts Accruing to Logging Company (Contractor and Subcontractor Average Gross Receipts Excluding Payments to Concessionaire, Royalties and Taxes) (RM Per Ha)	26,250.00
Harvesting Cost Per M ³ (RM Per M ³)	131.25
Harvesting Cost (Based on an average timber content of 40m ³ Per Hectare) (RM Per Hectare)	5,250.00
Profits (RM Per Hectare)	21,000.00
Total Profits For All Logging Companies Per Year (400,000 Hectares)	8,400,000,000

Source: Calculation/Estimation based from the following sources. Figure for Gross Receipts from "The Dwindling Forest Beyond Long San", *The Economist* 316, No. 7668 (18 August 1990), p. 15; Harvesting Costs from *Economic Case for Natural Forest Management: Country Reports*. PCV (VI)/13 Volume II. Japan and Malaysia: ITTO and FRIM, October 1994b, pp. 24 and 61.

¹¹ This was discussed in Section 3.2.1 of Chapter Three.

- *Factors Influencing the Strength of Demand*

Largely perceived to be an inactive lobby group by ITTO (1990),¹² STA cannot be seen as a weak lobby group if the network among timber operators, concessionaires, and politicians is taken into account. This network provides vast resources available to the group for lobbying. Note, for example, the ability of the STA to organise overseas mission trips to promote a favourable image of the industry. STA also chooses not to "rock the boat" because the structure and institutional arrangement of the timber industry is already very much in its favour. Individuals (concessionaires) within this organisation derive large profits with minimal investments (Lian 1990);¹³ the "gold rush" attitude where forested areas are treated as a source of income rather than that of capital which was discussed in Chapter Four.

The close network of links between the STA, and the state government and the Sarawak Forest Department play an important part in STA's success in demanding favourable property rights; it also reduces the visibility of STA lobbying actions. Concessionaires and logging contractors in Sarawak have close links to politicians, as concessions and logging companies are sometimes owned directly by politicians and their families (Arentz, 1996; Colchester, 1989; Hong, 1987; Lian, 1987; Sarawak Study Group, 1992). The Chair of STA, Datuk Lau, is consulted on a regular basis by politicians in government and is known to have a close relationship to the Chief Minister.¹⁴ Arentz (1996) refers to the link between politicians and logging companies as an "open secret".¹⁵ About ten concessionaires dominate timber holdings in Sarawak.¹⁶ STA's links and connections ensure that property rights are supplied to favour the commercial timber function of forests, which in turn protects their timber interests (profits and revenues). For example,

¹² ITTO (1990), op. cit., p. 128.

¹³ F.J. Lian, "The Timber Industry and Economic Development in Sarawak: Some Contemporary Trends and Proposals for 1990 and Beyond", in A.M.M. Salleh, H. Solhee, and M.Y. Kasim, eds., *Socio-Economic Development in Sarawak: Policies and Strategies for the 1990s*. Proceedings of a Seminar held at Kuching, Sarawak, October 10-12, 1988, Kuching, Sarawak: Angkatan Zaman Mansang (AZAM), 1990, pp. 125-126.

¹⁴ F.M. Cooke, "The Politics of "Sustainability" in Sarawak", *Journal of Contemporary Asia* 27, No. 2 (1997), p. 227.

¹⁵ F. Arentz, "Forestry and Politics in Sarawak: The Experience of the Penan" in R. Howitt, J. Connell, and P. Hirsch, editors, *Resources, Nations and Indigenous Peoples: Case Studies from Australasia, Melanesia and Southeast Asia*. Melbourne: Oxford University Press, 1996, p. 207.

¹⁶ *ibid.*

note the speed with which legislation was passed by the State Legislative Assembly in 1987 forbidding blockades in response to the widespread unrest caused by native groups during that period; an instance where logging interests were favoured at the expense of native interests.¹⁷ There has been strong motivation for politicians and bureaucrats to supply rights to timber because of this general parallelism of interests between the STA and politicians.

The STA does not get all of its demands met. The STA has had to consider, or be perceived to consider, environmental concerns as negative reactions from consumer countries have been affecting Sarawak's timber exports and hence hurting its profits. In the ITTO (1990) interview with STA, the Chair pointed out that it has had to defend its members against criticisms of the timber industry launched by local and foreign NGOs and also the media. It is worth noting that in the ITTO interview with the STA, the timber industry in Sarawak was already facing many "artificial trade barriers" which emanated from actions of the environmentalists, notably SAM. The Netherlands and Germany had already imposed restrictions on tropical timber while the US was considering bans.¹⁸ STA also seemed to be quite sensitive of the impact of logging on native livelihood as it attested that logging operations provided many benefits for natives in the form of employment (around 80 percent of tractor drivers were Iban),¹⁹ and logging roads as a means of communication for natives.²⁰

Another factor favouring the STA as a demander of property rights is its familiarity with local conditions. The STA is made up of Sarawakians familiar with politics of the region, is small (as noted above, around ten concessionaires own most of the rights to harvest

¹⁷ During the first blockades, two cases went to court. Native rights to erect blockades and protect their lands were upheld. This then resulted in the amendments made to the Forest Ordinance by the state in 1987 making it illegal for anyone to obstruct timber roads (Forests (Amendment) No. 6 of 1987).

¹⁸ ITTO (1990), op. cit., p. 125.

¹⁹ This point certainly is not true from all accounts. Lian (1987) points out that the ethnic Chinese contractors tended to give many of high salaried jobs, including that of tractor drivers, to ethnic Chinese. Employees were contracted workers normally from the urban sector; see F.J. Lian, *Farmers' Perceptions and Economic Change - The Case of Kenyah Farmers of the Fourth Division, Sarawak*. Unpublished PhD Thesis, Australia: Australian National University, July 1987, pp. 182-183.

²⁰ In the same interview, the STA was rather defensive and denied that logging had destroyed fishing and aquatic life in the upper rivers. In addition, STA also denied that wildlife was affected by logging and that operators were killing wildlife; it was pointed out that animals have merely moved to other undisturbed areas. See *ibid.*

timber), and cohesive in terms of its timber centric focus. Such factors help to lower its operational costs of lobbying. Also, in line with the concentrated benefits principle, since just ten concessionaires dominate concession holdings (Arentz, 1996), collective action is not paralysed by free riding. In fact, the concentration of immediate benefits (timber profits) going to the STA members (concessionaires, logging contractors and sub-contractors) is likely to provide continued motivation for political priority for timber harvesting rights. This is because benefits flowing from the specification of rights to the timber industry are large and concentrated for members of this interest group. However, the costs of any resulting damage to other forest functions will be passed to the various native groups and to people dispersed across Sarawak and overseas where the costs suffered by each individual will be modest. Remember that profits per ha of timber harvested have been estimated to be RM 21,000 per ha and it should be noted that concessionaires, and logging contractors and subcontractors derive the largest proportion of profits from timber harvesting while wages to timber workers amounting to only 4 percent of the gross income from the sale of timber (Lian, 1990; Sarawak Study Group, 1992). In addition, the costs of coordination are relatively lower because of the smaller spread of beneficiaries (benefits being local). The concentration of benefits and diffused costs principle, an important concept in VPE, applies in this instance in explaining the vigour of demand for favourable property rights by the STA.

6.4.2 Sahabat Alam Malaysia (SAM): Environmental Forest Function

- Identifying Beneficiaries

SAM was established in Peninsula Malaysia in 1977 by a local businessman, S.M. Idris, J.P. (Justice of Peace), as a private, non-profit educational, research, and community orientated citizens' group. It was formed to deal with environmental degradation and conservation issues in Malaysia.²¹ One of SAM's chief and early concerns was the impact of environmental degradation on the well being of local communities.²² SAM's

²¹ *Directory of Environmental NGOs in the Asia-Pacific Region*. Penang, Malaysia: Sahabat Alam Malaysia, 1987, p. 222.

²² *ibid.*

prominence as an environmental lobby group in Sarawak lies in the fact that it has been providing a ready avenue, since the 1970s, for individuals concerned with environmental matters to amalgamate their expertise and to jointly support one another in their efforts towards protecting the environment and local communities. Membership of SAM is voluntary and individuals join on the basis of SAM reflecting their concerns and being able to further their interests and gain benefits through collective action. That SAM has survived through the years suggests that it has served its purposes of protecting the environment and communities, and in lobbying for these concerns. The core leadership of SAM consists of local businesspeople, academics,²³ and professionals (lawyers²⁴ and ex-civil servants) with a high degree of educational sophistication and environmental consciousness. SAM in Malaysia has about 200 members, employs ten people, and is funded by local contributions and environmental groups.²⁵ Incidentally, as part testimony to SAM, McDowell states that "Malaysian environmental groups possess a degree of sophistication and influence at least equal to that of western groups."²⁶

- Shifts in Value [Part d(ii)]

In terms of part d(i) of the analytical framework, SAM has been spurred into collective action because of perceived gains from a respecification of property rights. In 1982, Harrison Ngau, a local Kayan of Sarawak, set up the Sarawak branch of SAM.²⁷ By then, SAM's activities in Peninsula Malaysia were already well publicised. Ngau set up the Sarawakian branch because he was "concerned about logging in the late 1970s when its devastating impacts began to become apparent."²⁸ Like its counterpart in Peninsula Malaysia, the focus of SAM in Sarawak is on the impacts of environmental deterioration and its impact on the community, and in particular affected native communities.²⁹

²³ Its vice president Khor Kok Peng was previously a lecturer at a Malaysian university. See Khor (1983).

²⁴ Chee Yoke Ling who is the Honorary Secretary is a lawyer by training.

²⁵ Berger, R., *Malaysia's Forests: A Resource Without a Future*. Chichester: Packard Publishing Limited, 1990, p. 195.

²⁶ M.A. McDowell, "Development and the Environment in ASEAN", *Pacific Affairs* 62, No. 3 (Fall 1989), p. 321.

²⁷ *The Battle for Sarawak's Forests*, Second Edition, Malaysia: World Rainforest Movement and Sahabat Alam Malaysia, 1990, p. 298.

²⁸ *ibid.*

²⁹ *ibid.*, p. 173.

Such need to organise collective action to demand property rights respecification became more urgent in Sarawak in the 1980s when logging began on a massive scale. This placed an increasing value on the environment and also on the social functions performed by forests for native groups. For example, witness the subsequent and timely publication of Hong (1987) from SAM (via Institut Masyarakat) documenting the impact of logging on the well-being of native groups and the environment during this era. Hence the motivation for SAM's actions has arisen because of an increase in the value of native and environmental functions.

- Factors Influencing the Strength of Demand [Part d(ii)]

SAM has special links with Malaysian NGOs like the Consumer Association of Penang (CAP)³⁰ and the Institut Masyarakat³¹ which have similar perspectives on the environment and local communities.³² This agglomeration of local interest groups increases its strength (in terms of providing more resources) in demanding property rights changes. In the discussion here, SAM in Peninsula Malaysia and Sarawak can be subsumed under SAM because the core leaders have operated interchangeably between areas.

SAM's linkages with international groups of similar interests are another factor that has increased the chances of its success in demanding a respecification of property rights. Through this network, SAM has had access to additional resources for lobbying. The importance of networks in lobbying is also supported by Cooke (1999).³³ SAM is an affiliate of the international environmental organisation known as 'Friends of the Earth' (FOE) which is an organisation established in the UK (Berger, 1990, Eccleston in Potter,

³⁰ Khor is the Principal Officer of CAP and the vice-president of SAM.

³¹ Idris is the Principal Officer of this organisation which carries out research activities in social and economic issues of disadvantaged groups in Malaysia. The areas of concern include climate/atmosphere, energy, food and agriculture, technology and industry and water resources, human settlements and habitat, land use, natural resources, general environmental concerns, socio-economic aspects of international development. Again, CAP also shares a similar focus. See *ibid.*, p. 164 and p. 168.

³² Both are Malaysian grassroots-orientated research and educational organisations which research into social and economic issues of poverty groups but have broader concerns that include general economic development issues, and also the protection of consumer rights. However, the main focus of all three organisations centers on environmental protection. See *Directory of Environmental NGOs in the Asia-Pacific Region*. *op. cit.*, pp. 164-165 and pp. 168-169.

³³ F.M. Cooke, *The Challenge of Sustainable Forests: Forest Resource Policy in Malaysia: 1970-1995*. Australia: Allen & Unwin, 1999, p. 148.

1996). An international secretariat in the UK coordinates the exchange of information between the entities. Although affiliation with FOE is more on information sharing and dissemination rather than joint campaigning,³⁴ sales of SAM publications in the North through FOE³⁵ have provided additional resources to SAM. The spatial distribution of environmental benefits in this case has facilitated a North-South collaboration. The costs of coordinating such operations are not excessive because it has been based on information sharing and dissemination rather than on the joint organisation of activities.

SAM has also been coordinating the APPEN (Asia-Pacific People's Environment Network) which links a diverse group of non-governmental organisations (NGOs) and people in the Asia-Pacific region.³⁶ This network of NGOs has also served to strengthen SAM's demand by providing it with more avenues (resources) for lobbying on a wide scale. For example, by circumventing domestic media restraints, international NGOs provided a platform for SAM to raise the plight of the forest natives internationally.³⁷ SAM's success has in turn forced the state to address such campaigns.³⁸ However, this has come at a price because SAM has been portrayed as a puppet of Northern NGOs. Despite this, SAM believes that the advantages of global collaboration outweigh the risks.³⁹ SAM's continuing collaboration with the World Rainforest Movement supports this contention.⁴⁰

SAM's effectiveness as a lobby group in demanding a respecification of rights has been acknowledged by Sarawak's Director of Forests who pointed out that SAM and other foreign environmental groups had released sensational articles into the international media which discredited Sarawak's politicians and the State; SAM especially was alleged to have

³⁴ B. Eccleston, "Does North-South Collaboration Enhance NGO Influence on Deforestation Policies in Malaysia and Indonesia?" in D. Potter, editor, *NGOs and Environmental Policies: Asia and Africa*. London: Frank Cass, 1996, pp. 75-77.

³⁵ *ibid.*, p. 79.

³⁶ Berger, *op. cit.*, pp. 195-196.

³⁷ Eccleston, *op. cit.*, p. 79.

³⁸ *ibid.*, p. 81.

³⁹ *ibid.*, p. 86.

⁴⁰ *The Battle for Sarawak's Forests*, Second Edition, *op. cit.*, was a joint publication by SAM and the Rainforest Action Network.

fed "the international media with biased and vicious information on Sarawak".⁴¹ SAM's activities in organising demonstrations at Malaysian embassies and high commissions, ITTO meetings, and other international conventions was also cited by the Director as further instances of negative publicity. This has resulted in international repercussions for the Sarawakian timber trade directly affecting timber royalties and revenues. The government has had to send a mission overseas to correct some of the misconceptions, testifying to SAM's strength in lobbying.

Its long establishment and familiarity with the region are other factors that have made SAM an effective demander of property rights. Since the early 1980s, SAM has been conducting research and surveys on many of the features of forestry practices in Sarawak and their impacts on native communities, and the politics behind the timber industry (SAM, 1990).⁴² In the process, it has built a substantial information base with important native contacts established through the years. This information base and contacts has enabled SAM to quickly mobilise collective action: note the speed with which SAM has effectively mobilised native groups to draft resolutions, declarations and requests to the Sarawak state government, and how it has been a successful vocal lobby group to state and federal governments concerning the negative impact of logging on the environment and on native livelihoods in the latter part of the 1980s.⁴³

In terms of the concentration of benefits to SAM, and to its leaders, it should be recognised that although benefits derived from demanding a respecification of forest rights are non-monetary, they have nevertheless been sufficient to overcome free riding and inertia. This is probably because some benefits from its lobbying efforts are concentrated specifically on SAM and on individuals within the organisation. Such benefits include direct recognition (appreciation) of its efforts in galvanising action in Sarawak. Rewards to SAM have taken the form of recognition received, in line with the Olson's (1965) discussion of non-monetary benefits: recognition from the international and local

⁴¹ L. Chai, "Environmental Issues Relating to Logging and Adverse Publicity by Non-Governmental Organisations", *Sarawak Gazette* CXVIII, No. 1518 (December 1991), p. 13.

⁴² SAM, *Solving Sarawak's Forest and Native Problem*. Malaysia: Sahabat Alam Malaysia, 1990.

⁴³ "SAM Memorandum: Appeal by the Orang Ulu Natives to Protect their Lands, Forests and Resources (A Memorandum by Sahabat Alam Malaysia Appealing to the Federal & State Governments of Malaysia &

community of SAM's efforts in protecting the environment and native rights. In 1988, SAM won the Right Livelihood Award also known as the 'Alternative Nobel Prize', presented by the Swedish Parliament for SAM's efforts in saving tropical forests for natives in Sarawak.⁴⁴ Both the President of SAM, S.M. Mohd. Idris, and its Sarawak representative, Harrison Ngau, were also specially acknowledged. In receiving this award, Idris stated that: "[I]t is nice to know that our battle for a better environment has been internationally recognised. We will dedicate ourselves to redouble our efforts especially in our programmes to save what is left of the Sarawak and Malaysian forests which are being relentlessly logged at the expense of the forest peoples, the environment and future generations."⁴⁵ In April 1990, Harrison Ngau, SAM's Sarawak representative was among six environmentalists in the world to win the Goldman Environmental Prize.⁴⁶ Ngau's efforts in leading native communities in their fight to protect tropical forests were again acknowledged. Such acknowledgment and recognition of SAM's effort, and also of Ngau, provides rewards that are non-quantifiable but nevertheless important in terms of overcoming free riding and in making demands for a respecification of property rights.⁴⁷

6.4.3 Native Groups: Shifting Cultivation, Edible and Non-Edible Forest Products, Native Graveyards

- Identifying Beneficiaries

Nearly forty per cent of Sarawak's population is native, and stand to benefit when forested areas are reserved for native shifting cultivation, edible and non-edible forest products, native abodes, and burial grounds. Such a large grouping should provide significant leverage for natives in terms of demanding for changes in property rights. However, unlike the other interest groups, cohesiveness among native groups has been absent. Dayak unity has been "disempowered at a traditional level" since the Brooke regime (from 1839 to

Sarawak to Protect the Lands, Forests & Resources of the Natives of Sarawak)" reproduced in *The Battle for Sarawak's Forests*, Second Edition, op. cit, pp. 195-223.

⁴⁴ *The Battle for Sarawak's Forests*. op. cit, p. 290.

⁴⁵ *ibid.*, p. 290.

⁴⁶ *ibid.*, pp. 298-301.

⁴⁷ In winning this prize, Ngau stated that "this award will make my colleagues and friends more enthusiastic in our defence of the environment and the people's rights ...", *ibid.*, p. 298.

1946) because of the replacement of native elected aristocratic headmen (*Tuai Rumah*) with government appointed headmen to represent state interests.⁴⁸ In addition, Iban groups (comprising eighty per cent of the native population) have been highly individualistic with absence of a clear hierarchy of leadership.⁴⁹ This has made the organisation of collective action difficult.

Native groups have also not been united politically since the 1960s when Sarawak gained its independence.⁵⁰ Native under-representation had arisen because Dayak political loyalties have been scattered across a number of political parties in the National Coalition and also in the opposition since historical times (Chala, 1993).⁵¹ As a result, native interests have not been adequately represented in formal political decision making. It was only through SAM's assistance in the 1980s, that collective action by native communities became more significant.⁵²

In recent years, however, native representation also seems to be changing with the setting up of native communal associations, especially in the 1980s and 1990s. Tan (1994, 1997) has attributed the growth of communal associations to an "increase in the number of well-educated people in an ethnic community, who feel more acutely the need for a "modern" communal association to articulate their own and their perception of their ethnic community's aspirations in an evolving economic and political order."⁵³ However, the full potential of such associations has yet to be realised, as such associations were newly formed and inexperienced during the 1980s when massive logging was occurring.

⁴⁸ T. Chala, *Development and Change in Sarawak: An Analysis of a Conflict*. Unpublished Master of Arts Thesis (Geography Department), University of Melbourne, June 1993, p. 78, and M. Colchester, *Pirates, Squatters and Pouchers: The Political Ecology of Dispossession of the Native Peoples of Sarawak*. Malaysia: Survival International, INSAN, 1989, p. 18-19.

⁴⁹ Chala, op. cit., p. 81.

⁵⁰ J.A. Jawan, *Iban Politics and Economic Development: Their Patterns and Change*. Bangi: Penerbit Universiti Kebangsaan Malaysia, 1994, p. 229.

⁵¹ Chala, op. cit., p. 78

⁵² This is discussed in greater detail, later in this section.

⁵³ *ibid.*, p. 230.

- Shifts in Value [Part d(i)]

It was in the late 1980s that the costs imposed by logging on native livelihoods were sufficient to stir massive collective action by grassroots native groups. This manifested itself in the form of widespread timber blockades and political lobbying in 1987 on a state and also federal level. In terms of part d(i), an increasing scarcity of forest functions valued by natives led to an increase in the value of such functions. This increase in value then increased the expected benefits of protecting such functions and of organising collective action; in this case, of blockades to protect their concerns.

Another manifestation of the increasing value attached to native functions was the more rapid formation of communal associations in response to the extensive intrusion of logging on natives' livelihood (Tan, 1994, 1997).⁵⁴ ⁵⁵ Only four native associations were formed in the 1970s. From the beginning of the 1980s to 1991, eleven communal associations were formed.⁵⁶ In Tan's words:

Our survey of Dayak associations (sic.) shows that the need to form communal associations is very much linked to the nature of economic "development" and nation building. The single most crucial "development" issue which had caused all the Dayak groups to mobilise ethnic solidarity in response is the infringement on their land rights. The greatest threat to the Dayak land rights and even livelihood is logging, and all the Dayak groups have responded to this issue. Even the nomadic and semi-nomadic Penan are forced to protest for their life-support systems in the jungle are threatened by logging activities which not only infringe on their jungle but also on animal and plant sources. We find that most Dayak associations were formed in the seventies and eighties at the peak of logging in Sarawak. The Kelabit associations in the seventies were formed in response to the infringement on the Kelabit highland by logging companies whose

⁵⁴ For example, the Uma Bawang Residential Association was formed in 1990 "in response to the encroachment of a timber company on the land owned by the Uma Bawang villagers. The company did not pay compensation to the villagers." See C.-B. Tan, *Communal Associations of the Indigenous Communities of Sarawak: A Study of Ethnicity and National Integration*. Institute of Advanced Studies Monograph Series: SM Bil. 9, Kuala Lumpur: Institute of Advanced Studies, University of Malaya, 1994, p. 147.

⁵⁵ The Sarawak Penan Association was formed in 1988 when the first meeting of Penan headmen was held in Marudi. Again, this association in the Tutoh region was formed in response to the impact of logging on Penan livelihood. The Kelabit Associations were formed when they felt the threat posed by logging in their traditional territory of Bario. See *ibid.*, p. 149, and C.-B., Tan, "Indigenous People, The State and Ethnogenesis: A Study of the Communal Association of the "Dayak" Communities in Sarawak, Malaysia", *Journal of Southeast Asian Studies* 28, No. 2 (September 1997), pp. 272 and 275.

⁵⁶ Tan, 1994, *op. cit.*, pp. 272-278

activities have also threatened the existence of the forest of their sacred mountain Batu Lawi. Even the Uma Bawang Residential Association in Baram was formed by the Kayan mainly in response to the need to defend their traditional land.⁵⁷

- Factors Influencing Effective Demand [Part d(ii)]

The effectiveness of demand for a respecification of property rights in the 1990s was aided by capable leadership from the various communal native associations. Tan (1994, 1997) points out that the success of communal associations in articulating views has depended on the leadership factor, consisting mainly of educated individuals, to agglomerate and represent the interests of native communities.⁵⁸

The network of ties formed between native groups and SAM played a significant role in initiating and strengthening native collective action during the 1980s. SAM provided the organisational skills (resources) necessary for galvanising native action. This is reported in Chala (1993) who notes a major difference in the phase before and after 1987, indicating the importance played by SAM in aiding native groups to initiate collective action. In the pre-1987 period, most of the resistance that occurred had little impact outside the affected areas. It was in the Bakun Dam campaign in the mid-1980s that native struggles moved from a local to a national level.⁶⁰ After 1987, there was a deliberate strategy to bring the conflict to the national and international arena. The strength of native action has to a large extent been aided by SAM,⁶¹ as Chala (1993) contends:

The activities of SAM in organising meetings, workshops and conferences have provided venues for different tribal groups to come together and discuss common problems, strategies and solutions. It was noted by SAM that it was not until October 1989 that the indigenous people themselves organised a large meeting at Uma Bawang longhouse on the Baram. This

⁵⁷ *ibid.*, pp. 227-228.

⁵⁸ Tan, 1994, *op. cit.*, p. 6, p. 230, and Tan, 1997, *op. cit.*, pp. 268-269, p. 273.

⁵⁹ Tan, 1994, *op. cit.*, p. 230.

⁶⁰ *ibid.*, p. 77.

⁶¹ The proposed construction of the Bakun Dam may have been the last straw which broke the camel's back as it represented further reductions in the availability of forests for native subsistence and also removal of their rights. This may have been the catalyst for natives to organise blockades in view of the increasing scarcity and value of forests for its subsistence and social needs.

indicates the role of SAM in the organisation of prior meetings which would have facilitated Dayak ability to set up their own meetings. ...

Through SAM the Dayaks have broadened and altered their powerbase, moving from an isolated position in the early years of independence to gaining significant national and international support.⁶²

As noted in Chapter Three, and in the previous section (Section 6.4.2), SAM has been formed by individuals concerned for the environment and the impact of environmental degradation on native communities. It is important, however, to distinguish between the concerns of SAM and that of native groups. Even though SAM has emphasised the importance of forests for native livelihood, there are differences in emphases between SAM and native groups. The concerns of SAM are based on the twin objective of environmental preservation and the protection of native livelihood. Native groups however would not be so concerned with the environmental functions of forests but rather with their roles in providing for shifting cultivation, edible and non-edible products, abodes and native graveyards. However, SAM notes that forests have been sustainably used by the various native groups and, as such, there have been common grounds for both groups to work together (Hong, 1987). In addition, SAM's profile and prestige has been increased because of the support it has given to native communities, while native communities have benefited from SAM's organisational and logistical skills.

SAM has in effect served as a catalyst for the various native groups, often disorganised and disunited in the ruling political coalition, and even at the grassroots level in the early 1980s, to better organise themselves into an effective and coherent lobby group, and to effectively demand that the state government consider native concerns.⁶³ Native unity was particularly strong during 1987. After the blockades, a flurry of workshops were organised by natives in the Baram and Limbang Districts to discuss problems arising from logging. Numerous resolutions, declarations, and letters were sent to the state and federal governments urging development that was in the interests of natives.⁶⁴ With the assistance provided by SAM, native groups have been able to unite and gain international support which has in turn impacted on Sarawak's timber exports and the profits and revenues of

⁶² Chala, *op. cit.*, pp. 106-107.

⁶³ *ibid.*, p. 106.

Sarawak. For example, the European Parliament passed a resolution on July 1988 calling on all member nations to ban timber exports from Sarawak because of its impact on the livelihood of native groups and also on the environment.⁶⁵ The state government itself sanctioned an official and confidential study on the impact of logging on the Penan in the Baram and Limbang Districts after the occurrence of the blockades.⁶⁶

The lack of adequate native representation in official political spheres may have led to SAM fulfilling this important function of communicating native dissatisfactions to the state and internationally. However, although it was initially with SAM that the natives started to gain attention as one coherent voice, native dependence on SAM was to diminish in the 1990s with natives themselves becoming more organised politically at a grassroots level.⁶⁷

In terms of the concentration of benefits, the political prominence of communal leaders, which paves the way for a future career in politics, may have provided strong incentives for political action:

Active leaders of communal associations emerge as prominent communal leaders, and this is politically advantageous if later they decide to stand for state or national election. ... We have seen that a number of leaders of communal associations have later become successful politicians. There is attraction for politicians (both government and opposition politicians) and would-be politicians to become leaders of communal associations.⁶⁸

This is in line with the VPE argument that concentrated benefits have helped to overcome free riding.

⁶⁴ *The Battle for Sarawak's Forests*, op. cit., Part IV.

⁶⁵ SAM, *Solving Sarawak's Forest and Native Problem*, op. cit., pp. 56-64.

⁶⁶ M. Kavanagh, A.A. Rahim, and C.J. Hails, *Rainforest Conservation in Sarawak: International Policy for WWF*. Malaysia: WWF Project No. 3262, Nov. 1989, pp. 38-43.

⁶⁷ Chala, op. cit., p. 107.

⁶⁸ *ibid.*, p. 231.

6.4.4 ITTO: Commercial Timber, Biodiversity, Erosion Control, Human Subsistence

- Identifying Beneficiaries

In discussing the ITTO, a slightly different approach has to be adopted because of the divergent interests present within the organisation itself. Hence it is important first to discuss how a consensus has been reached among signatories, in spite of the different interests present in member countries, and why common concerns have been able to prevail in the organisation.

The International Tropical Timber Organization (ITTO) was created from a Japanese initiative that found shape in a resolution tabled at the United Nations Conference on Trade and Development (UNCTAD) in 1977 (Humphreys, 1996). ITTO initially intended to create a commodity agreement among member countries, similar to that already in existence for rubber and jute, to stabilise the export incomes of timber-producing countries.⁶⁹ However, such an agreement did not eventuate. It was realised that tropical timber could not be treated as a single commodity due to a wide variety of tree species present (Colchester, 1993). Protracted negotiations at UNCTAD took place between civil servants who dealt with the trade aspects of timber, and foresters who deliberated on the technical complexities of timber.

A crucial about-turn occurred when the UK based policy research organisation, the International Institute for Environment and Development (IIED), "argued that the agreement could not limit itself to the technical and commercial concerns of timber extraction and trade but must also provide for other crucial ecological and genetic services provided by forests."⁷⁰ The IIED was later supported by the IUCN (World Conservation Union formerly known as the International Union for the Conservation of Nature and

⁶⁹ D. Humphreys, *Forest Politics: The Evolution of International Cooperation*. London: Earthscan Publications Ltd., 1996, p. 56.

⁷⁰ M. Colchester, "The International Tropical Timber Organization: Kill or Cure for the Rainforests?", in S. Rietbergen (editor), *The Earthscan Reader in Tropical Forestry*. London: Earthscan Publications Ltd., 1993, pp. 188-189.

Natural Resources) who also pushed for the need to consider the ecological functions performed by forests.⁷¹ This ultimately resulted in an international agreement to promote trade in tropical timber, and, at the same time, to ensure the sustainable utilisation of tropical forests and the conservation of genetic resources.⁷² ITTO thus became the first international organisation involving producer (developing countries) and consumer countries (developed countries) with such goals. ITTO is made up of government representatives from each country consisting of officials, civil servants, foresters, and specialists from the various biological and social science disciplines.

The International Tropical Timber Agreement (ITTA) formulated in 1983,⁷³ was ratified in 1986 (Kasimbazi, 1996). ITTO was then entrusted with the task of implementing the articles contained in the ITTA,⁷⁴ with Japan to house the Secretariat of ITTO while Malaysia provided its first Executive Director, Dr Freezailah, then Deputy Director of the Malaysian Forestry Department. The International Tropical Timber Council (ITTC), and several permanent committees in ITTO, are responsible for assessing compliance by signatories of the ITTA.⁷⁵ In this respect, the Committee on Reforestation and Forest Management, and the Committee on Forest Industry are responsible for supporting reforestation programmes, and promoting cooperation in timber processing activities among signatories. However, as Kasimbazi notes, direct enforcement mechanisms to ensure compliance are weak as the committees and council are only limited to coordinating activities among countries, with little supervision.⁷⁶

Members join ITTO to obtain direct benefits which would not have been possible if this organisation did not exist. Producer countries benefit from having an organisation to collectively voice their concerns about the various artificial barriers imposed by the developed countries. And while it may seem that there are less benefits for consumer

⁷¹ Humphreys, op. cit., p. 56.

⁷² ITTO, 1990, op. cit., p. 2.

⁷³ Much of the protracted negotiations before the emergence of the ITTA was to work out who would control this organisation. The struggle was in part to also work out a voting system. It was finally agreed that votes be divided equally between producers in the tropical and consumers in the developed countries; Colchester in Rietbergen, op. cit., p. 189.

⁷⁴ E. Kasimbazi, "Sustainable Development in International Tropical Timber Agreements", *Journal of Energy and Natural Resources Law* 14, No. 2 (May 1996), p. 144.

⁷⁵ *ibid.*

⁷⁶ *ibid.*, p. 147.

countries to join such an organisation, the ITTA provides a framework for consumer countries to officially have a say on the manner in which tropical timber will be harvested, and for environmental measures to be implemented by the producer countries. Although votes are equally divided between 'producers' (23 producing countries in the tropics) and 'consumers' (27 consuming countries in the industrialised world), consumer votes are apportioned according to the degree in which a country is involved in importing timber, and producer votes depend on the amounts of timber exported. In this respect, Colchester argues that "the more a country destroys tropical forests, the more votes it gets."⁷⁷ However, this is not necessarily true. A balance in interests has been continually maintained throughout the years despite the concentration of consumer and producer votes in the "Japan-South East Asia" faction.⁷⁸ This faction has had to incorporate environmental and ecological concerns in its policies to make the whole delicate coalition workable, in order to allow trade in timber without hindrances or threats of boycotts from other developed countries in the organisation.

In addition, ITTO is constantly monitored by international environmental and consumer groups which are quick to provide a check on its guidelines and policies.⁷⁹ This is based on Article 15 of the ITTA 1983 which allows observer status to be granted to any NGO at ITTO meetings. This has been evidenced by WWF Malaysia's attendance of such meetings. SAM has also attended such meetings.⁸⁰ International environmental groups (Friends of the Earth, Rainforest Action Network, Survival International) have been able to pressure the ITTO through lobbying exerted on governments at their home base, usually through criticism in the media. NGOs have an established publicity machinery that has been quite detrimental to ITTO's role as a facilitator of the timber trade (Colchester in Rietbergen, 1993). The emphasis on environmentally sustainable timber utilisation by member countries of ITTO has continued because of such pressures.

⁷⁷ Colchester in Rietbergen, 1993, op. cit., p. 189.

⁷⁸ *ibid.*, p. 190.

⁷⁹ Humphreys, op. cit., p. 71.

⁸⁰ *ibid.*, p. 61, and Colchester in Rietbergen, 1993, p. 200.

- Shifts in Valde

In line with part d(i), ITTO has been formed chiefly to sustain and expand the benefits of trading in timber, to promote the further utilisation of wood resources, and to protect the environmental and ecological functions of forests. The need to further promote the utilisation of wood resources had arisen because of the increasingly favourable prices of timber in the 1980s and 1990s. ITTO's second goal, to ensure the sustainable utilisation and conservation of tropical timber resources and their ecological balance, is, in part, in response to the increasing scarcity of environmental and ecological functions of forests (ITTO, 1990, 1996), and is advocated by the developed-country members of ITTO.

- Factors Influencing Effective Demand[Part d(ii)]

In terms of size, ITTO is formidable as it represents an aggregation of views from timber producing and consuming countries. ITTO serves as a venue for producers and consumers to consult with one another through the "ITTA [which] seeks to improve market information, and to discourage over-harvesting and deforestation."⁸¹ As almost all tropical (producers) and developed (consumer) countries are parties to the agreement, "ITTA has a significant potential role in the promotion of forestry regulation at a global level."⁸² In the renewed ITTA, 1994,⁸³ there is now a network of 32 producer countries and 32 consumer countries participating, with voting power equally divided between producers and consumers, depending on the amount of timber imported or the amount of timber produced. A two-thirds majority must be secured before any decisions can be passed.

⁸¹ Kasimbazi, op. cit., pp. 143-144.

⁸² ibid., p. 144. The ITTA covers 90 per cent of the world's trade in timber.

⁸³ Partly in response to widespread criticisms from environmental groups and academics that the ITTA, 1983, was too timber centric, and to further the causes of sustainable management in forests, this agreement was subsequently revised. This was in line with ITTO's goal of developing an international agreement in timber that had ecological and environmental conservation in mind. In 1994, through a revision of the ITTA, 1983, ITTO furthered the goal of sustainable management by having the ITTO 2000 target whereby tropical timber will be sourced from forested areas which have been sustainably managed. Sustainable forest management being defined as maintaining a continuous flow of desired forest products and services without undesirable effects on the physical and social environment. See ITTO, 1994c, op. cit., p. ii. This agreement, like the previous, is not legally binding but has clauses that provides incentives for sustainable management in the form of financial resources (research and project funds) for developing countries to achieve the sustainable management of their forests. See Preamble of the International Tropical Timber Agreement, 1994. Retrieved from the Internet on 15 July 1997. (<http://>

Also, because of the large number of consuming countries (mostly from the North) involved, ITTO reflects the views held by such countries on timber harvesting practices, and this factor plays an important role in making ITTO an effective demander of property rights.

ITTO's network of producer and consumer countries also plays a part in ensuring that its recommendations and policies are not taken lightly by member countries. Although the ITTA, 1983, (and also the new ITTA, 1994), has no explicit authority to monitor or force compliance,⁸⁴ negative reports of forest management practices by ITTO may play quite a strong deterrent role to ensure that sustainable forestry practices are being adhered to, or at least the appearance of attempts to follow policies prescribed by ITTO. Non-compliance with ITTO's policies could have repercussions for a country's ability to export its timber. The presence of a large number of forest specialists and practitioners in ITTO lends credibility to its assessments and recommendations.

Another important incentive for developing countries to participate in ITTO lies in "the opportunity to benefit from financial, trade, investment and technological assistance and cooperation"⁸⁵ from the consumer (developed) countries. ITTO's demands for changes in property rights are strengthened by its ability to disburse financial assistance to countries that comply with the ITTA, through its special account (in which the largest single donor is Japan).

ITTO implements the objectives of the ITTA in part through its project studies, greatly assisted by the base of wealth provided by the consumer countries in the coalition. Projects encompassing ITTO's ecological and environmental concerns in Sarawak have included a study on the management standards of hill forest from a watershed point of view, a model forest management area, and development of the Lanjak-Entimau Wildlife Sanctuary as a Totally Protected Area, mostly funded by Japan, and in part by Sweden, Denmark, and

www.itto.or.jp/agreements/itta1994/PREAMBLE.HTM). Hence, the influence of ITTO will continue to permeate into the forest policies of Sarawak.

⁸⁴ Kasimbazi, *op. cit.*, pp. 147-148.

⁸⁵ *ibid.*, p. 146.

Malaysia.⁸⁶ Credibility from detailed research results by specialists trained in the various disciplines from different member countries often carries weight when disseminated publicly. This serves as additional pressure on respective countries to comply with policy recommendations; non-compliance would impact on timber exports.

The ITTO influence on the regulation of Sarawak's forests is demonstrated by its mission which visited Sarawak in 1989 (ITTO, 1990). The ITTO mission recommended that Sarawak cut down its log production by 30 percent,⁸⁷ Sarawak has partially complied by reducing its levels of timber production but by less than the suggested figure. The ITTO also recommended that water catchments be protected by redefining rights, and that the level of forestry enforcement staff be increased. The Sarawak governments' positive responses to these recommendations demonstrates the effectiveness of the ITTO as a demander of property rights changes in Sarawak.⁸⁸

At the same time, the large number of producer and consumer countries has also limited ITTO's strength in making demands on member countries, for the following reasons. First, the large number of countries (62 in total) in the ITTA, 1994, means that consensus may be impossible due to divergent country concerns. However, there is significant potential for agreements to be reached as most of the benefits and votes are concentrated in the hands of a few countries. As discussed earlier, it has been argued by Colchester that this concentration of power has been self serving in that it advances the interests of the producer countries. However, demands made by any faction have to incorporate both economic and environmental concerns because of the need for attract a two-thirds majority of votes, which must include both producer and consumer countries.

⁸⁶ International Tropical Timber Council, *Report on Project Work in Progress in the Field of Reforestation and Forest Management*. PCF (XIX)/5, Japan: ITTO, 13 November 1996.

⁸⁷ Furthermore, contrary to assertions that the mission was just a "window dressing" exercise, information contained in this report had been constructively and objectively critical of the Sarawak authorities and it also detailed the sometimes unpleasant views of native groups on the Sarawak government.

⁸⁸ This is evidenced by the redefinition on National Parks and the new category of Nature Reserves as areas that also incorporate the protection of water catchments.

6.4.5 WWF: Conservation of Plant and Animal Biodiversity by the Establishment of TPAs

- Identification of Beneficiaries

The World Wide Fund for Nature, Malaysia, WWFM, formerly known as World Wildlife Fund Malaysia was established as a trust fund organisation in 1972 by the World Wide Fund for Nature International (WWF International), a non-profit organisation based in Gland, Switzerland. The WWF family of organisations has been set up by individuals with a scientific concern in conserving biodiversity and in managing protected areas: genes, species, ecosystems, and ecological processes.⁸⁹ In part, the origins of WWF in the West reflects the correlation between rising affluence and increasing environmental concerns. WWF Malaysia is part of the larger WWF family which exists internationally in twenty seven countries.

Initially WWFM began as a two person organisation consisting of the President, Khir Johari, and the Executive Director, Ken Scriven. In recent years, this has grown to 60 full time staff under M. Kavanagh.⁹⁰ WWF Malaysia is staffed by local and international biologists, scientists, academics, education officers, lawyers, administrators, marketing and communication officers, and business and industry professionals who have a concern for issues of conservation.⁹¹ Through WWF Malaysia, such concerned individuals have managed to effectively present their concerns to the governments in Sarawak. The major form of "lobbying" by WWFM is undertaken through the dissemination of research surveys and studies by scientists concerned with different aspects of wild life conservation.

- Shifts in Value [Part d(i)]

WWF Malaysia was spurred to collective action because of the rising value of biodiversity caused by the removal of forested areas in Sarawak. This is in line with part d(i) of the

⁸⁹ WWF Annual Report 1996 in <http://www.panda.org/wwf/Report/page2.htm>, no date. Retrieved from the internet on 21 October 1997.

⁹⁰ "25 Years of Conservation in Malaysia: The Birth of WWF Malaysia" in <http://www.geocities.com/RainForest/2701/AR2.HTM>, no date. Retrieved from the internet on 3 October 1997.

analytical framework. This become pressingly more important in the 1980s, when environmental degradation became more severe, caused by logging and the clearing of land for commercial agricultural purposes.⁹² In this respect, WWF began to emphasise the importance of increasing the conservation of forested areas to protect biodiversity (Kavanagh, 1985; WWF, 1985). Hence the demand for a respecification of property rights had come about because of an increase in value of the biodiversity. In line with its objective and scientific approach in conservation, WWF Malaysia has been basing its demands for a respecification of rights based on these grounds.⁹³

- Factors Influencing Effective Demand [Part d(ii)]

In line with part d(ii) of the analytical framework, the wealth of WWF has provided it with the resources necessary to demand for a respecification of property rights. This has allowed it to fund its research advisory role in order to support conservation projects in Sarawak. Funds to support WWFM have mainly been obtained through local donations, and from WWF International. In 1996, the WWF International network income reached US\$ 293 million.⁹⁴ Since 1972, WWF Malaysia has spent over RM 1.277 million (US\$ 0.51 million) on conservation projects in the state of Sarawak alone.⁹⁵ Majority of this funding was expended in the 1980s on undertakings like surveys of Wild life Sanctuaries and National Parks, the generation of data for the protection of endangered species, the identification and promotion of new conservation areas, and on educational projects.⁹⁶

⁹¹ *ibid.*

⁹² WWF, *Conservation Strategy Malaysia: Proposals for a Conservation Strategy for Sarawak (Confidential)*. A Report Submitted to the Government of Sarawak by the World Wildlife Fund Malaysia by L. Chan, M. Kavanagh, Earl of Cranbrook, J. Langub, and D.R. Wells in Collaboration with the State Planning Unit of Sarawak. Malaysia: WWF, December 1985, p. 4.

⁹³ WWF has documented the significance of wild life on native livelihood (Caldecott, 1986). Bennett (1989) discussed the importance of mangrove forests to sustaining wildlife especially the proboscis monkey and the red-black-and-white banded langur. WWF has also studied palm utilisation and conservation in Sarawak highlighting the presence of non-timber products available in forests (Pearce, 1990). The importance of different types of forest habitats in the Samunsam WS for different primates (proboscis monkey, banded langur, silvered langur, long tailed macaque, and Bornean Gibbon) was investigated in a study by Rajaratnam (1992). In addition, rainforest management was also studied with practical management policies suggested (Kavanagh, Rahim, and Hails; 1989).

⁹⁴ WWF Annual Report 1996 in <http://www.panda.org/wwf/Report/page4.htm>, no date. Retrieved from the internet on 21 October 1997.

⁹⁵ Kavanagh, Rahim, and Hails, *op. cit.*, p. 52.

⁹⁶ Table 8.1 of *ibid.*

The size of WWF provides WWFM with the leverage to lobby Sarawak for a respecification of property rights. The WWF is one of the largest international conservation groups with projects in more than 70 countries.⁹⁷ The size of WWF itself is formidable leverage in terms of its ability to disseminate information to individuals interested in conservation issues. For example, in the 1990s, WWF's ambassador project involved the dissemination of information by WWF Malaysia to its counterparts in Switzerland (WWF International), Denmark, United Kingdom, and Japan.⁹⁸

Collaboration between members of WWF network has been possible because of a network of links between WWFM and its international counterparts. This has enabled WWFM to carry out research which would otherwise not have been possible due to a lack of local Malaysian expertise. Notably, the WWF study on rainforest conservation in Sarawak by Kavanagh, Rahim, and Hails (1989) consisted of members of staff from WWF Malaysia (Kavanagh and Rahim) and Hails who is the Programme Director of WWF International. Many other WWF studies also have this element of local and international collaboration which has provided WWFM with the resources necessary to conduct its scientific research, and hence to voice its conservation concerns. In addition, free riding is overcome because individual efforts are recognised with due accreditation given to the author(s) of each project or study

Collaborative efforts with the Sarawak government have also enhanced WWF's effectiveness in demanding a respecification of property rights. The link which WWF has had and continues to have with the governments of Malaysia and Sarawak is important in explaining the success this group has had in demanding respecifications of rights. For example, WWFM has been able to conduct research in Malaysia with official cooperation, with support and infrastructure provided by the government. This has also meant that its research output and views are more easily accepted by the state governments due to logistical support and input provided by the various governmental agencies. For example, the Sarawak Natural Resources Ordinance in 1993 took many of the recommendations

⁹⁷ "UK: Controversy Forces Rethink on World Wide Fund's Investment Policy", *Guardian*, 5 September 1990, p. 3.

⁹⁸ S.T. Mok, A.A. Jalil, and D. Jiwan, *A WWF Strategy for Tropical Forest in Sarawak*. Report Produced Under WWF Project No. 3262 Follow-Up. Malaysia: WWF, November 1991,

presented in the conservation strategy presented in WWF (1985) and formalised them into legislation.

The Sarawak government has also benefited from the scientific input provided by WWF Malaysia which reduced the state's own research expenditures. In addition, countries and governments supporting the WWF are also perceived to be conscious of conservation (which then makes their products more acceptable in the West) and this has served as an incentive for countries to allow WWF to operate and conduct research within their boundaries. This has in turn enabled WWF to play a greater role in influencing (demanding) policy changes; and, in particular, has played a critical role in WWF Malaysia's success in demanding changes in the specification of forest property rights. In addition, WWF Malaysia has also been successful in getting its conservation concerns across to the Sarawak government because its focus has always been on scientific facts.⁹⁹ Hence, WWF is perceived as a scientific organisation concerned with conservation, basing its research on objective scientific information.

Because of its relationship with the government, WWF Malaysia was allowed to officially conduct research on forestry issues in Sarawak in the late 1980s even after the blockades in 1987, when political sensitivities were high. Its recommendations that staff levels for enforcement be increased, that catchments areas be protected in legislation, and that Wildlife Sanctuaries be accorded a more secure status, subsequently also echoed in the ITTO (1990) mission, resulted in changes in the definition of property rights to protect biodiversity in Sarawak (amendments to the Wildlife Protection Ordinance in 1990 which gave precedence to Wildlife Sanctuaries over other land uses),¹⁰⁰ and also increases in the staffing levels in the Sarawak Forest Department. WWF's favourable image has also been confirmed by Mok, Jalil, and Jiwan (1991) who reported that WWF's presence and role in resolving the controversy in Sarawak's forest management practices was generally viewed in a very positive manner by the Malaysian authorities. However, by the mid-1990s, such cooperation had somewhat been reduced due to intense criticisms of Sarawak's forest

⁹⁹ Kavanagh, Rahim, and Hails, *op. cit.*, p. 51.

¹⁰⁰ Mok, Jalil, and Jiwan, *op. cit.*, p. 12.

management practices by other foreign NGOs which have made the Malaysian authorities less open.¹⁰¹

Familiarity with the region has played a part in increasing the effectiveness of WWFM's collective action. Through the years, and coupled with its emphases of always presenting conservation issues in a less threatening scientific manner, the conservation efforts of WWFM have been widely accepted by the Sarawak Forest Department and the Sarawak government (Kavanagh, Rahim, Hails, 1989; Morshidi and Gumal, 1995; Mok, Jalil and Jiwan, 1991). In this sense, familiarity with the region has lowered its costs of lobbying. The presence of WWF in Sarawak since the 1970s and experience and familiarity that WWF has had in dealing with the Malaysian authorities has made this organisation a very useful and cost-effective lobby group for conservation issues in Sarawak.

In terms of leadership, WWF has had much success as a lobby group as its leaders have been effective in avoiding implicating themselves in Sarawak politics; they have been careful to be projected as a research and fund-raising rather than a campaigning organisation and one which also relies on networking with government officials (Berger, 1990). This politically skilled leadership factor has in turn aided WWF in its demands for a respecification of property rights. As Berger states:

The World Wide Fund for Nature does not see its role as that of a pressure group like the other Malaysian conservation organizations, and avoids criticisms of government policy. ... The board of WWFM consists of a group of influential people from all walks of life, and exerts pressure on government at the top. Its success depends, therefore, on the individuals within the network retaining their influence, and not, ..., on 'grass-roots' support.¹⁰²

6.5 State Politicians and the Supply of Property Rights

Political decisions on the respecification of rights depend on the information and incentives (structure of rewards and penalties) faced by politicians. The ruling coalition (politicians) makes decisions based on its overriding objectives of staying in power and of

¹⁰¹ *ibid.*, p. 25.

¹⁰² Berger, *op. cit.*, p. 197.

maximising support (votes).¹⁰³ The emphasis on political power and voter support is, in itself, a positive aspect as it involves taking into account overall community desires, although certain facets of property rights specification may be given a higher priority than others due to the costs of information and interest group distortions of information.¹⁰⁴ This links to part d(iii) of the analytical framework which examines evidence of property rights specification stances by politicians and bureaucrats that enhance their objective function.

Maximising voter support does not imply that timber is emphasised to the complete exclusion of other forest functions. Nor does it imply that the timber profits of concessionaires and logging companies are the only consideration for the State government when it comes to maximising political support. This has been illustrated by the example of WWF, where the state and federal governments have supported WWF conservation efforts even when those efforts may conflict with timber production. However, as timber brings in benefits that are direct and excludable, the supply of property rights to timber will be emphasised above conservation. Such aspects are discussed in greater detail in Section 6.7. First, however, it is important to understand the emphasis placed on timber revenues and profits.

In Sarawak, state politicians have generally been perceived as favouring or "supplying" the specification of forest property which favour logging companies and concessionaires at the expense of other forest functions. Understanding the structure of Sarawak politics and how timber benefits (and hence the supply of timber property rights) affect the balance of political power in Sarawak is important for identifying incentives faced by politicians to supply forest property rights which favour timber production.

¹⁰³ Overriding does not imply that some politicians do not have visionary ideas or a genuine concern for the economic development, or the environment and of the well being of the Sarawakian community and of natives communities in particular. However, this approach assumes that although such ideologies or goals may exist, in general, this does not influence political decision making in an overarching manner.

¹⁰⁴ As Browning and Browning point out: "Those who seek office and those who hold elected offices play a role in politics similar to the role of businessmen in private markets. ... To stay in business, businessmen are led to take account of consumers' interest by virtue of having to produce a product that consumers want. Likewise, politicians are led to take account of voters' interests by having to offer a policy "package" that attracts enough voters to stay in office. ... Political survival requires that politicians pay attention to the vote-gaining and vote-losing effects of their actions just as business survival demands attention to the profit picture. Politicians may believe that they are acting "in the public interest" (and indeed may be, according to their own conception of public interest), but they would not be successful unless their actions *also* attracted

Sarawak's politics have been dominated by the three major ethnic groups, the Dayak, the Chinese, and the Malay/Melanau since the 1960s (Chala, 1993; Leigh, 1974; Jawan, 1994; King, 1993). During that period, representation of the three groups in the ruling coalition was more or less equal. The Land Bill Crisis of 1965 that led to realignment, with a shifting of alliances from the Chinese and Dayak to the Chinese and Malay/Melanau faction (Jawan, 1993, 1994).¹⁰⁵ The 1970s witnessed the further undermining of Dayak representation in the ruling coalition as the Chinese and Malay/Melanau factions forged a common goal of utilising the commercial agricultural sector and the timber for economic diversification, both of which are detrimental to the interests of the Dayaks (Chala, 1993; Jawan, 1993, 1994). In Sarawakian politics, parties in the ruling coalition have to strike deals with one another to maintain their vested interests and power (Chala, 1993, 1995; Cooke, 1997; Dauvergne, 1997; King 1993; Leigh, 1974; Leigh in Hirsch and Warren, 1998; and Jawan, 1993, 1994). As King states:

... in a context of electoral politics, there is quite complicated political manoeuvring - striking deals with other parties, shifting alliances and so on - to secure a legislative majority in the State Assembly. No one party or ethnic group can command a working majority without forging an alliance with others.¹⁰⁶

This alliance and common interest between the Chinese and Malay/Melanau still governs with politicians in both factions owning major interests in timber concessions. This 'timber bond' is crucial as there has been no clear dominance by one faction over others. Again, as King points out:

... unlike the Peninsula, where there is clear Malay dominance bolstered by a subservient Chinese party in alliance with UMNO, in Sarawak the Muslims are by no means secure. The Sarawak Chinese play a much more important role as political power-brokers because there is an alternative to Muslim *bumiputra* state leadership, and that is Dayak state leadership,

votes." in E.K. Browning, and J.M. Browning, *Public Finance and the Price System (Second Edition)*. New York: Macmillan Publishing Co., Inc., 1983, pp. 69-70.

¹⁰⁵ This Bill was attempted to modify the land rights to favour the Chinese at the expense of the Dayak by allowing the Chinese to purchase land held by native groups. This bill was subsequently overturned by fierce Dayak opposition (Jawan, 1993).

¹⁰⁶ V. T. King, "Politik Pembangunan: the Political Economy of Rainforest Exploitation and Development in Sarawak, East Malaysia", *Global Ecology and Biogeography Letters* 3, Nos. 4-6 (July/September/November 1993), p. 240.

should the Chinese ever switch their allegiance to the non-Muslim natives.¹⁰⁷

Rights to harvesting timber in concessions owned by the Malay/Melanau faction has been contracted out to the Chinese faction in the coalition to strengthen cross-party alliances. This has been succinctly termed by King as 'production sharing':

The production-sharing arrangements between *bumiputra* rent-seekers and Chinese business is rooted in the long-established division between Muslim-Malay/Melanau administration and Chinese economic concerns. Furthermore, although timber licences are a necessary element in securing and maintaining political support from one's relatives, friends and clients, the arrangements with Chinese entrepreneurs are an important means to cement cross-party alliances between *bumiputra* and Chinese political leaders; these alliances, as we have seen, are essential in the context of Sarawak's political system.¹⁰⁸

Hence, forest policy in Sarawak "has been subverted to serve the interests of the ruling elite, who have used the handing-out of logging concessions as political favours and as a source of personal wealth to ensure their positions."¹⁰⁹ Chala (1993) points out that it is the timber licence holders (contractors consisting of the ethnic Chinese groups, most of which are of the Foo Chow dialect), and to a lesser extent the concession holders, that have gained the greater part of the timber profit rather than the state¹¹⁰ which only gains revenue thorough royalties collected. Chala also points out that timber "favours" were granted to the Foo Chows to ensure that the eleven majority Chinese seats continue to support the Taib government.¹¹¹ Dauvergne (1997) points out that Datuk Tiong Hiew King who owns the Rimbuan Hijau Group of companies controls 800,000 hectares of timber and logging contracts in Sarawak.¹¹² Tiong has powerful political ties with the Sarawak government and is also a Federal Senator. Another ethnic Chinese who is significant in Sarawak timber politics is Tan Sri Ting Pek Khiing, the chairman of Ekran Company, who controls

¹⁰⁷ *ibid.*

¹⁰⁸ King, *op. cit.*, 242.

¹⁰⁹ M. Colchester, "Pirates, Squatters and Poachers: the Political Ecology of Dispossession of the Native Peoples of Sarawak", (Updated and Shortened Version) *Global Ecology and Biogeography Letters* 3, Nos. 4-6 (July/September/November 1993), pp. 172-173.

¹¹⁰ Chala, *op. cit.*, p. 131.

¹¹¹ *Business Times Singapore* 26/9/1991 cited in *ibid.*, p. 132.

¹¹² P. Dauvergne, *Shadows in the Forest: Japan and the Politics of Timber in Southeast Asia*. Cambridge, Massachusetts: The MIT Press, 1997, p. 110.

600,000 ha of forests and was awarded the contract for building the Bakun Dam.¹¹³ Furthermore, the practice of transfer pricing ensures that the logging companies pay little corporate taxes.¹¹⁴

Another manifestation of the subversion of interests to favour the ruling elite is in the manner in which royalties have been charged to favour timber operators and concessionaires. Vincent (1990) reports that the royalty system in Sarawak has been drastically undervalued with a "tremendous transfer of wealth from the public sector to private concessionaires."¹¹⁵ Government forest revenues in Sarawak only accounted for an average of 18.4 percent of potential rent from timber; whereas in Sabah and Peninsular Malaysia, the figure was 46.2 percent and 21.8 percent respectively for the years 1966-1985.¹¹⁶

Given the combined Malay-Chinese interest in timber profits, it is also not difficult to see why politicians emphasise the supply of rights to protect timber because it directly increases political support from the Chinese faction in the ruling party, enabling a majority to be formed in government.¹¹⁷ And the means to capture these benefits has been through the specification of property rights in favour of maximising profits and returns from timber. In addition, some forestry officials themselves have logging interests via relatives and nominees, thus having a vested interest in maximising short term returns to the company rather than in assuring the careful management of forests.¹¹⁸

¹¹³ *ibid.*, p. 111.

¹¹⁴ According to Dauvergne (1997): Transfer pricing occurs when ethnic Chinese companies sell their logs to "home companies", often in Hong Kong. These logs are priced at the costs of extraction and, as a result, the local company's books show minimal profits. The Hong Kong company then sells the logs at market prices but profits in Hong Kong are taxed at a much lower rate than Malaysia. Such profits are then deposited into banks in Hong Kong and is "borrowed" by the Sarawak company with interest payments equal to the interest paid in Hong Kong. Because the money returns as a loan, it is tax exempt. See *ibid.*, p. 115.

¹¹⁵ J.R. Vincent, "Rent Capture and the Feasibility of Tropical Forest Management", *Land Economics* 66, No. 2 (May 1990), p. 216.

¹¹⁶ *ibid.*

¹¹⁷ Since 1966, the timber portfolio has been under the control of Parti Bumiputera. From 1970-1981, it was directly under the control of the then Chief Minister, Tun Haji Abdul Rahman Yakub. When he became the Governor, the control was passed on the Datuk Haji Nor Tahir, one of Tun Rahman Yakub's supporters. From 1985 onwards and up to present times, the portfolio is in the possession of the nephew of Tun Rahman Yakub and the present Chief Minister, Datuk Patinggi Tan Sri Haji Abdul Taib Mahmud. The Minister for Resource Planning (which is also headed by the Chief Minister) has absolute control over the allocation of timber licences and concessions.

¹¹⁸ Colchester, 1993, *op. cit.*, p.173

Understandably, therefore, there has also been a legislative curtailing of forest activities which conflict with the harvesting of commercial timber. For example, the official view that shifting cultivation has destroyed valuable tracts of primary forests containing timber which provides revenues and employment to Sarawakians has often been stressed (Lau, 1979; Wong, 1992). This has also been clearly expressed in many official circles, notably the *Annual Reports of the Forest Department Sarawak*, and notably a publication by Sarawak's Minister of Environment and Tourism, Datuk Amar James Wong.¹¹⁹

Politicians in the ruling coalition and their relatives and supporters own or control sizeable amounts of the concessions in Sarawak. Nowhere is this better demonstrated when a factional crisis erupted in 1987. This crisis arose when the present Chief Minister, Datuk Tan Sri Taib Mahmud, started freezing the timber licences awarded to the allies of the previous Chief Minister Tun Rahman Yakub on the grounds that the terms of the licences had not been correctly observed.¹²⁰ This arose because Tun Yakub wanted to form his own breakaway party. As a result, each side started exposing in newspaper reports the extent of the involvement of the other side in the timber industry (Colchester, 1993; Yu, 1987). Forest concessions belonging to the political allies and relatives of the former and present chief ministers are detailed in Appendix 6.2.

However, non-timber concerns cannot be completely overlooked as this can have a negative impact on the objectives of politicians in Sarawak. Bad publicity through the media has threatened the profit of concessionaires and logging operators through potential bans or boycotts on Sarawakian timber. Collective action from SAM, for example, has imposed costs on Sarawak's government as the state has had to incur expenses to diffuse the negative publicity surrounding timber practices and its impact on native customary rights.¹²¹ This is reflected in the Austrian attempt to ban imports of tropical logs, although

¹¹⁹ J.K.M. Wong, *Hill Logging in Sarawak*. Kuching: Sarawak Press, 1992; pp. 18-20.

¹²⁰ *ibid.*

¹²¹ For example, SAM's (1990) research on the impact of the removal of forests on the environment and on the subsistence of native communities through its impacts on native farmlands, water resources, sacred ancestral burial grounds, fruit trees and other resources spurred the European Parliament to draft a proposal to address such grievances. Hong (1987), published by the Institut Masyarakat (SAM's sister organisation), has documented in a very extensive manner the impact of logging on edible and non-edible forest products

this was subsequently overturned because it contravened the General Agreement on Trade and Tariffs (GATT).¹²² Other instances include the Dutch Parliament considering a halt to import of unsustainably harvested timber, and local councils in the Netherlands, Germany, and the UK deciding not to use tropical hardwoods in their construction projects.¹²³ The Sarawak government invitation to the ITTO mission to assess the forest situation could be attributed to earlier negative publicity generated by SAM as Sarawak has been "indicted as an outstanding example of over-cutting, destructive logging and unrestrained deforestation".¹²⁴ In addition, this was also to counteract being "the target of a great deal of adverse publicity, world-wide, alleging the violation of human rights and victimization of native peoples who oppose logging because it is destructive of their traditional way of life."¹²⁵ As Colchester (1993) points out: "Evidently the Malaysian authorities hoped that such a mission would be an exercise in damage limitation, a way of demonstrating to the outside world their willingness to deal openly with the controversy, while controlling just what the mission might actually look into."¹²⁶

In addition, a negative image of an uncaring government may also result in a loss of votes from the general public. Thus the non-timber functions of forests which are of concern to native communities cannot be ignored entirely. Native people make up nearly forty percent of the Sarawak population. There will be dire political consequences, in terms of a loss of political support, if their interests are ignored completely. This actually occurred in 1987, with the formation of the Parti Bansa Dayak Sarawak (PBDS). This was set up as a faction from within the ruling coalition to represent Dayak interests and to pose a challenge to the ruling coalition.¹²⁷ The PBDS was unable to effectively mount a challenge as it was in the

important to native subsistence in the Baram District and the Belaga District. Hong's publication is a widely quoted and has received attention from the academia, ITTO, and forest practitioners.

¹²² B.F. Chase, "Tropical Forests and Trade Policy: The Legality of Unilateral Attempts to Promote Sustainable Development Under the GATT", *Third World Quarterly* 14, No. 4 (November 1993), p. 761.

¹²³ Colchester in Rietbergen, op. cit., p. 198.

¹²⁴ ITTO, 1990, op. cit., p. 5.

¹²⁵ *ibid.*

¹²⁶ Colchester in Rietbergen, 1993, op. cit., p. 200.

¹²⁷ In the early 1980s, many Dayak were feeling frustrated with the Federal/Malay-Melanau manipulation of the Sarawak National Action Party consisting of Dayak (SNAP) that they abandoned it to form the Parti Bansa Dayak Sarawak (PBDS). This faction was mainly questioning the control of the party in the hands of an ethnic Chinese. At first, the Chief Minister sought to incorporate the PBDS into the national coalition. But this did not happen. In 1987, a snap election was called following an attempt to force the Chief Minister, Datuk Taib Mahmud, to step down. The opposition faction led by the Chief Minister's uncle and former Chief Minister, Tun Rahman Yakub, created his own new party, Persatuan Rakyat Malaysia Sarawak

opposition rather than in the ruling coalition. However, this and other similar events ensure that there will be incentives for politicians to pay some attention to the specification of rights to the non-timber functions of forests.

Another direct cost imposed on timber revenues and profits by native groups is the possibility of further blockades. Political pressure from the various native groups in the form of widespread blockades in 1987 did exert some pressure which ultimately led to a greater consideration of native interests and issues of environmental degradation.¹²⁸ A new upsurge of blockades in early 1989 in the Baram District, which continued to September,¹²⁹ led to the Malaysian Government to announce a total ban on log exports in November 1989, but which was rescinded to a gradual phasing out of log exports.¹³⁰ However, the lack of cohesion among the various native groups and their under-representation in the political coalition means that native concerns have not been of primary importance but rather secondary to the interests of the Malay/Melanau and Chinese political factions in the period under study.

6.6 The Sarawak Forest Department and the Supply of Property Rights

In Sarawak, the Forest Department is the bureaucratic agent appointed by Legislature to manage Sarawak's forests: it is responsible for overseeing ordinances set by the Legislative Assembly. In terms of part d(iii) of the analytical framework, the Department enforces property rights in the various forest functions.

(PERMAS), and forged an opportunistic alliance with the PBDS. Dayak support for the PBDS clearly demonstrated that a new sense of unity had emerged. However, this was negated in 1987 since the PBDS was in the opposition. This meant that the Dayak voice against logging and other Dayak issues could not be adequately represented. In general, support from the Iban tended to fluctuate and they have not been able to unite behind a single political faction, unlike the Malay/Melanau who have united behind the PBB and the Chinese behind the Sarawak United People's Party (SUPP) in the National Front. Importantly, Iban components within the Parti Pesaka Bumiputera Bersatu (PBB) and SUPP have been kept alive within these ostensibly multi-ethnic parties and this in turn has undermined Iban unity (Colchester, 1993; Jawan, 1994).

¹²⁸ Pressure from natives took the form of blockades between March 1987 and October 1987 which were set up in the Baram and Limbang districts. In June 1987, in the middle of blockading, a delegation of twelve indigenous leaders from different tribes (including the nomadic Penan, and the settled Iban, Kayan, Kenyah, Kelabit and Lun Bawang) went to Kuala Lumpur to plead their case to high ranking ministers and officials. This trip was organised by SAM.

¹²⁹ *The Battle for Sarawak's Forests*, Second Edition, op. cit., pp. 11-13.

¹³⁰ *ibid.*, p. 14.

One of the basic objectives of Sarawak bureaucrats is that of maintaining and increasing administrative size (budgetary allocation, staff size) which runs contrary to the objectives of politicians.¹³¹ Being rational decision makers, bureaucrats will enforce rights to the extent that their objectives are enhanced. However, they will also consider non-timber interest groups to the extent that reaction from such groups can affect their objectives, for example, when resistance by native groups increases their costs of managing forests.¹³²

Evidence on the divergence between the interests of the Forest Department and politicians can be illustrated in three areas: the Department's emphasis on timber royalties (to safeguard their budgetary allocation), leniency towards illegal shifting cultivators (easing the Department's management), and the stress on general understaffing (enlarging their size).

- Emphasis on Revenues

An important justification for the setting up of a Forest Department is its ability to manage and to collect revenues from logging operations. It is natural for the Forest Department to place priority on timber because revenues (royalties and taxes) derived from logging are an indicator of its performance, indicating that it has been performing its bureaucratic role satisfactorily.

Increases in the allocation of funds towards forest management also allow the Forest Department to expand its bureaucratic size. The collection of revenues is again directly related to this objective. The allocation of expenditure by the federal government, although in theory independent of the revenues collected by the Department, is in practice difficult to sustain or increase if timber revenues have been declining year after year. This is because the Malaysian Government has been encouraging contractionary rather than

¹³¹ To state that bureaucracies are only interested in maintaining or increasing their administrative size appears to be an oversimplification. However, this oversimplification allows factors like the emphasis on revenues and staff size to be incorporated into the basic objective of size maximisation. The amount of revenues collected is one factor that can be used for justifying the present size of a bureaucracy or even its plans for future expansion. Again, the argument for increasing staff size is directly related to size of the bureaucracy.

¹³² Pressure in the form of native blockades has created adverse publicity and also disrupted the activities of logging companies which in turn has affected the operations and revenues of the Forest Department.

expansionary budgets.¹³³ The annual budget of the Sarawak Forest Department is set in two stages. First it has to be approved by the State government. Second, approval has to be granted at the Federal Level by the Public Services Department in conjunction with the Federal Treasury. This process has placed a lot of emphasis on the collection of timber revenues and royalties.

The importance of timber revenues to the Forest Department is shown by its organisational structure whereby each branch related to commercial timber in Kuching is overseen by an Assistant Director, except the Amenities and Conservation Branch which deals with biodiversity; this branch is only overseen by a Senior Executive Forester. Also, the research activities of the Forest Department have emphasised improving timber production from forests, rather than activities like the conservation and study of biodiversity (ITTO, 1990) which have provided less tangible benefits to the Department. Additionally, the slow constitution of National Parks and Wildlife Sanctuaries over the years, as pointed out in ITTO (1990), also shows that the priorities of the Sarawak Forest Department are focussed elsewhere. Numbers of staff in the Amenities and Conservation Branch are limited, and the Branch relies on support from outside voluntary bodies like the WWF. Only 94 out of 1,546 staff in the Sarawak Forest Department were involved in managing National Parks and Wildlife Sanctuaries in 1990.

The emphasis on revenue collection can be seen in the allocation of new staff to revenue evasion versus management. After the approval of the ITTO (1990) recommendation of staff increases, most of the additional staff employed by the Sarawak Forest Department were deployed to prevent royalty evasion instead of other areas like forest supervision.¹³⁴ Notably, the three hundred additional staff employed in 1993 were allocated towards preventing illegal logging and the evasion of royalties.¹³⁵ The zeal of the Forest Department in preventing royalty evasion also runs contrary to the interests of some politicians, as efforts by the Forest Department to prevent royalty evasion reduces the profits of concessionaires and loggers. The emphasis on preventing the evasion of timber royalties by the Sarawak Forest Department represents a divergence between politicians'

¹³³ ITTO, 1994c, op. cit., p. 76.

¹³⁴ *ibid.*, p. 32.

and bureaucrats' interests in terms of the enforcement of rights. This may explain why there has been understaffing in the Sarawak Forest Department, succinctly stated by Arentz (1996) in a study of Sarawak's forestry practices:

The Sarawak Forestry Department is seriously understaffed. This was acknowledged by the ITTO Mission, which listed greater support for the Sarawak Forestry Department (SFD) as one essential ingredient in increasing the sustainability of the forest industry. In 1989, the state of Sarawak earned 674.9 million ringgit from logging but spent only 35.1 million ringgit (5.2 per cent) on financing its regulatory body. In comparison, peninsular Malaysia earned 303.2 million ringgit and spent 91.7 million ringgit (30.2 per cent) on its forestry department. ... Without adequate funding, it is impossible to expect the SFD to regulate an industry with such a massive output. But why is the SFD so starved of funds? Clearly the notion that the industry does not generate enough revenue is invalid. If keeping the SFD weak has been a deliberate policy, one can only speculate that such weakness has been in the interests of political figures, or they in turn have seen it as the interests of the state.¹³⁶

- Leniency Towards Illegal Shifting Cultivators

Another instance of divergence between the interests of the Department and politicians is in the treatment of illegal shifting cultivators. Both the Department and politicians have opposed illegal shifting cultivation; however, the Forest Department has at times adopted a 'softer' approach towards dealing with shifting cultivators (Petch, 1986). This has probably arisen because the Forest Department has had to deal directly with illegal shifting cultivators who could disrupt its day to day management of forests and also that of logging companies which then affects the revenues collected by the Department.

Primack and Tieh (1994) in their study of the Yong Khaw concession in Miri report that farmers have returned to cultivation after eviction and have even threatened to burn logging equipment.¹³⁷ Shifting cultivators have been known to be very persistent in their endeavours. As Petch (1986) points out, illegal cultivation has continued in the Sabal Forest Reserve in Kuching in spite of consistent eviction activities carried out by the

¹³⁵ Dauvergne, op. cit., p. 121.

¹³⁶ Arentz, op. cit., pp. 206.

¹³⁷ R.B. Primack, and F. Tieh, "Long Term Timber Harvesting in Bornean Forests: The Yong Khaw Case", *Journal of Tropical Forest Science* 7, No. 2 (December 1994), p. 273.

Forest Department. Also, eviction has created considerable animosity between natives and Forest Department officers.¹³⁸ This has in turn made eviction a very unpleasant activity.

The high costs of controlling shifting cultivation have led to bureaucratic shirking where prevention of this activity has not been carried out in accordance with the Forests Ordinance. A clear example of bureaucratic shirking is evident in the Sabal Agroforestry Project,¹³⁹ where the Forest Department called for more lenient "non-confrontational approaches" towards shifting cultivators. The Assistant Director of Research suggested that shifting cultivators be allowed to remain in the Sabal PFE to carry on with hill *padi* cultivation as long as the cultivators were willing to assist with reforestation and were forbidden to clear any new primary forest areas which was subsequently adopted. This was contrary to legislation in the Forests Ordinance (Sarawak Cap. 126) 1954 which forbids any form of occupation in PFEs. Another example of shirking is reflected by the Forest Department's imposition of fines of RM 10 to RM 50 for illegal shifting cultivation. This falls far short of the amount stated in legislation of at least RM 2,000 (Section 79 of the Forests Ordinance (Sarawak Cap. 126) 1954). Again, as Forest Department Officers in their field duties come into regular contact with native groups, the task of enforcement has been made all the more unpleasant and even dangerous. Forest Department Officers may have preferred to forego collecting high fines because such actions endanger their lives. Tong and Lim (1989) of the Sarawak Forest Department illustrate the threats that officers have to face:

All those participating in illegal activities are either those frustrated locals who need forested land for farming or those notorious and aggressive individuals or gangsters who would like to challenge the law in getting quick money. Many Protection Officers who had conducted field investigation had been threatened on their own safety and safety of their immediate family members. ... Many officers have many such nasty experiences and are in tensed and worried situation.

The Department is in the process of providing arms to the officers and at the same time, recruit Security Personnels to provide escort in field investigation. But all these are yet to be materialised.¹⁴⁰

¹³⁸ B. Petch, *Alternatives to Shifting Cultivation: The Sabal Agroforestry Project*. Forest Research Report SS15, Research Section, Kuching: Forest Department, April 1986, p. 9.

¹³⁹ Petch, 1986, op. cit., Appendix 5.

¹⁴⁰ Tong and Lim, op. cit., p. 6.

- *Emphasis on Understaffing*

In another area of divergent interests, the Forest Department has always emphasised that it is understaffed. Its goal of expanding its size is not explicitly stated but can be inferred from Forest Department reports and other related publications. For example, the Department has often stressed the constraints imposed by understaffing in discharging its responsibilities, and of the need to increase the number of staff and hence its administrative size (Annual Report of the Forest Department Sarawak, various years; Hitam and Wong, 1992; ITTO, 1990, 1994c; Marajan and Dimin, 1989). Importantly, the Forest Department has also supported the ITTO (1994c) idea of becoming a statutory body which would give it greater independence in decision making.¹⁴¹ In another instance, the National Parks and Wildlife Office requested a six-fold increase of up to 600 staff members in that section alone.¹⁴² In addition, there have been constant requests that the field staff be increased for other sections in the Department; in recent years a doubling of present field staff was requested.¹⁴³ Not that there is no justification for increases in staffing, but doubling the staff would have meant an additional employment of at least 750 field staff; a large figure that could never be approved due to the federal and state government's hiring freeze in 1982. This divergent interest is one aspect that has been pointed out in VPE: the Forest Department has incentives to create as large an organisation as possible in line with its own goals and objectives (size maximisation) which is not always in line with state and federal governments' objectives (cost minimisation). Also, the specialised knowledge that the Forest Department possesses in terms of forest management may provide leverage for the Department to bargain for increases in staffing because the state does not possess the knowledge to realistically assess the complete requirements and costs of forest management (rational ignorance as per VPE). The

¹⁴¹ ITTO, 1994c, op. cit., p. 79. Creating a statutory body without pensionable state but rather with a provident fund will remove the Forest Department from the administrative ambit of the Federal Public Services Commission and the Federal Treasury.

¹⁴² ITTO, 1990, op. cit., p. 129.

¹⁴³ This was reported in the US Congressional Staff Study Mission to Sarawak; see *The Tropical Timber Industry in Sarawak, Malaysia*. Report of a Congressional Staff Study Mission to Malaysia, March 25 to April 2, 1989 to the Committee on Foreign Affairs U.S. House of Representatives, Washington: U.S. Government Printing Office, 1989, p. 11.

possibility of the bureaucracy overstating its requirements, and also of shirking should not be overlooked when the divergence of interests is present.

6.7 Spatial Distribution and Excludability of Benefits: The Supply of Property Rights by Politicians and Bureaucrats

Besides affecting the effectiveness of demand, the intrinsic characteristics of forest functions also affect the incentives and information faced by politicians and bureaucrats in supplying property rights in forests.¹⁴⁴ This section examines the impact of spatial distribution and excludability on the supply of property rights. The discussions below help to explain why the specification of rights to timber is treated as more important than rights to other forest functions.

Commercial timber. The spatial incidence of benefits (revenues and profits from commercial timber) is local, accruing to logging companies owned mainly by ethnic Chinese who have political and financial links to the ruling coalition; and to concessionaires including politicians in power (*Bumiputra* and Chinese). Thus Sarawak politicians and bureaucrats have strong motivations to supply well-specified property rights to timber, as benefits accruing to such groups will translate into local political support for their objectives.

The benefits of timber are excludable; timber is bought and sold in commercial markets. With such visible benefits, and importantly with these benefits directly advancing the political interests of Sarawak politicians, incentives to supply rights to timber in Sarawak forests would be ranked higher than incentives to supply rights to functions whose benefits are indirect, or accrue to non-local or less well organised interest groups. For the Forest Department, revenues collected serve to protect its concerns of maintaining or increasing its size, and are a measurable performance indicator of its role as a bureaucratic body. Revenues generated from royalties, taxes and fees in the 1990s have on average exceeded RM 700,000,000 per year. Although performance can also be gauged by the Department's success in the protection of biodiversity, and water catchments, these benefits are non-

¹⁴⁴ Wills, 1997, op. cit., pp. 294-298.

excludable, and do not impact so directly on the Department's budget. As a result, such functions will be accorded a lower priority than timber.

Native shifting cultivation and agriculture. The spatial incidence of benefits is local and accrues to the native households that cultivate crops in a particular area. The importance of this function is also recognised by SAM which is concerned for the interests and well being of natives communities in Sarawak. The supply of such rights is ranked lower than the supply of rights for timber because benefits provided to native groups have less impact on political fortunes of the ruling coalition and on the budget of the Forest Department. Hence there is less incentive to supply well-specified rights to shifting cultivation unless this lack of specification gives rise to blockades that disrupt operations and affect timber profits (which accrue to supporters of politicians) and revenues (royalties and taxes collected by the Forest Department).

The benefits of cultivation are excludable and the value of these benefits can be estimated from the amount of rice and crops produced each year, although nearly all of the rice produced is consumed by native communities themselves.¹⁴⁵ However, shifting cultivation is viewed as a practice that has hindered forest management and also competes with the development of commercial agricultural schemes and the management of forested areas for timber, which, as noted above, provide more direct political and monetary benefits to politicians and bureaucrats.

Edible and non-edible forest products. The spatial incidence of benefits is local, accruing again to natives (and to SAM which is concerned about protecting native rights). The benefits of edible and non-edible forest products are rival and excludable. The incentives of politicians and bureaucrats to supply such rights would be similar to those for supplying rights to shifting cultivation. Politicians' and bureaucrats' incentive to supply rights comes from native groups protesting the loss of edible and non-edible forest products due to logging, and SAM's¹⁴⁶ dissemination of information related to the loss of forest products

¹⁴⁵ *Agricultural Statistics of Sarawak, 1995*. Sarawak, Malaysia: Department of Agriculture.

¹⁴⁶ SAM has close affiliations with the World Rainforest Movement and the Institut Masyarakat which published Hong (1987).

through reporting incidents in its various publications.¹⁴⁷ In particular, publications by the Institut Masyarakat and World Rainforest Movement have generated negative publicity about the Sarawak government and has created pressure by developed countries to appease native demands, notably, from the European Parliament.¹⁴⁸ However, incentives to specify rights to this function would be less than for specifying rights for timber given that overseas groups (from the World Rainforest Movement and developed countries) do not have such direct impact on funding and votes in Sarawak as do local timber groups.

Thus, although benefits from edible and non-edible forest functions are excludable, they do not have much impact on the objectives of politicians and bureaucrats, as the political support and influence from such groups are weak at best compared to support from timber groups like concessionaires and contractors. As such, there are lesser incentives to supply rights to these functions compared with rights to timber.

Native abodes and graveyards. The spatial incidence of benefits of native abodes and graveyards is local (benefits accrue to natives and to SAM which is concerned in protecting native rights). Benefits are rival and excludable, if not for individual households, then for the native communities. Information on the value of native abodes and graveyards to native groups and SAM would come from protests by natives in the form of blockades; anthropological studies documenting the cultural values of burial sites, and from SAM in documenting and reporting the impacts of logging on burial grounds to the community at large, again generating negative publicity about Sarawak which may result in pressure from overseas. Incentives for politicians and bureaucrats to specify such rights would be similar to that of specifying rights for other native forest functions.

Biodiversity. Benefits accrue at a local, regional, and global level to individuals and nature lovers concerned for conservation, particularly WWFM which has a strong concern for conservation issues in Sarawak and in Malaysia. Information on the value of biodiversity has been signalled by a number of WWF reports documenting the importance of various

¹⁴⁷ See *The Battle for Sarawak's Forests*, Second Edition, Malaysia: World Rainforest Movement and Sahabat Alam Malaysia, 1990 and also SAM, *Solving Sarawak's Forest and Native Problem*. Malaysia: Sahabat Alam Malaysia, 1990.

¹⁴⁸ *The Battle for Sarawak's Forests*, Second Edition, op. cit., p. 60 and p. 63.

aspects of wildlife and plant biodiversity in Sarawak; reports by ITTO (1990), and ITTO (1994a, 1994c), and protests by SAM which has brought the attention of biodiversity destruction to the international community. Group pressure has worked to the extent that specifying rights to biodiversity has helped to promote a positive image for the Sarawakian government and the Forest Department, making Sarawak timber exports more acceptable as in the cases of shifting cultivation and forest products, the influence of overseas groups on the objectives of politicians and bureaucrats would be less than that of local timber interests.

Biodiversity preservation is generally non-excludable. Individual species preserved may become excludable if the value of their products is sufficient to justify exclusion measures. For example, there is a recent account of an agreement signed between the Sarawak Government and the National Cancer Institute (NCI) of America which gave the NCI the right to conduct research on the Bintangor tree (*Calophyllum Lanigerum*) in return for a substantial but undisclosed amount paid to the Sarawak government. In addition the Sarawak Government will receive royalties from the use of the drug.¹⁴⁹ However, it is not possible to estimate the future benefits of preserving biodiversity in forest ecosystems not only because future benefits are non-excludable, but also because the functioning and long term value of such ecosystems to humanity are poorly understood.¹⁵⁰ Such difficult-to-monetise benefits provide little incentive for politicians and bureaucrats to rank the supply of such rights above rights to forest functions that provide direct monetary benefits.

Prevention of soil erosion and water catchment. These benefits are local and regional, accruing to natives (clean water supplies), to SAM (in terms of visible environmental maintenance and native well being), and to all Sarawakians in terms of drinking water. However, the greatest impact would be felt by native communities who are directly dependent on streams and rivers for clean sources of drinking water, and also aquatic resources. Group pressure will come from these communities, and the political and bureaucratic incentives to provide property rights to protect this forest function by politicians and bureaucrats would be similar to the cases of other native forest functions.

¹⁴⁹ "Royalty Payment for Anti-Aids Drugs from Bintangor Trees", *Perkasa* 12, No. 3 (September 1994), p. 3.

Soil erosion and water catchment benefits are non-excludable as communities deep in the interior and along the coasts both benefit from clean water. Again, these benefits would have a relatively low political and bureaucratic priority, as they conflict with timber harvesting which provides direct and excludable benefits to politicians and bureaucrats, at least until erosion and water supply problems impact on Sarawak's affluent urban communities.

Recreation and ecotourism. The spatial incidence of benefits is both local and regional (the Sarawak Government, the Forest Department, local tourist businesses, tourists within Sarawak and from Peninsular Malaysia), and global (tourists and tourist businesses from other countries). The importance of recreation and ecotourism has been recognised by the Forest Department since 1957, and also by the Sarawak State Government in the 1990s. However the development of the tourism industry in Sarawak could be described at best as "disorderly", with the Ministry of Tourism only formed in 1995 to promote the development of Sarawak's tourist potential. Hence the tourism sector in Sarawak is still relatively young and growing, and private business groups are yet to be sufficiently organised to affect the objectives of politicians and bureaucrats.

Although benefits from recreation and tourism are excludable, tourism revenues from National Parks pale in comparison to royalties and taxes collected from timber (less than one percent throughout the whole period under study). Hence it is only logical that politicians and bureaucrats will rank commercial timber production above this function.

6.8 Discussion and Summary

The specification of rights to forest functions has not been affected by costs alone, but also by the collective demands of interest groups interacting with the political will of politicians and bureaucrats who supply particular specifications of forest property rights. This chapter follows part d of the analytical framework which uses a demand and supply approach to explain outcomes in the specification of property rights in forests.

¹⁵⁰ See discussion in Wills, 1997, op. cit., pp. 283-288.

Part d(i) identified motivations which generate collective action when changes occur in the present state of forest use. In Sarawak, logging made the supply of non-timber forest functions scarcer and hence more valuable. Part d(ii) dealt specifically with the strength of demand emanating from different interest groups and identified several factors that are important in enhancing demand. Collective action by various interest groups in demanding a respecification of property rights created pressure on politicians' and bureaucrats' to consider interest group concerns. Factors influencing the strength of demand by the various interest groups included size of an interest group, its wealth, network of links, number of years established, leadership skills, and the concentration of benefits to groups and to individuals in a group. The concentration of benefits is influenced by the excludability of particular forest benefits. On the supply side of the model (Part d(iii)), the specification of rights has been geared towards specifying rights that directly enhance the objectives of politicians and bureaucrats. This involves rights specifications which enhance voter and political support by favouring political allies (securing profits and revenues from timber), while at the same time not completely ignoring the specification of rights to other non-timber forest functions to the extent that pressures from native communities and other non-timber interest groups have affected politicians and bureaucrats.

The demand and supply forces at work in political markets are perhaps best illustrated by considering an example. Suppose the Sarawak government has to consider the benefits and costs of a clearer definition and enforcement of rights to protect native burial grounds from intrusion by commercial logging activities. The spatial incidence of benefits of native graveyards is local (benefits accrue chiefly to natives, and to SAM which is interested to protect native concerns). Benefits are also rival and excludable; native customary rights in the creation of graveyards in particular areas are recognised as legal entities that belong to a particular group and to individuals. Hence demand will not be diluted by free riding. However, estimates of the monetary value of this function are not available as the creation of graveyards is not a commercial or marketable activity. Information received by politicians and bureaucrats on the value of native burial grounds would come from collective action by natives (in the form of blockades assisted by SAM); and by SAM in the form of documentation of the impacts of logging on burial grounds distributed in

Malaysia and overseas. Such have been the sources of pressure or demands imposed on politicians and bureaucrats to clearly define and enforce property rights to these areas.

The pressure exerted by native and environmental groups on the government and the Sarawak Forest Department to protect native burial grounds have been modest; votes and political support for politicians and the budgets of bureaucrats have not been greatly reduced by not placing much emphasis on rights to native burial grounds. Dayak representation in state politics is weak as Sarawak's politics has been dominated by the Chinese and Malay/Melanau factions since the 1970s. Although natives comprise nearly forty percent of the population, they have generally been too divided to unite and to press their concerns on the ruling coalition, or to influence Sarawak politicians to respond to their concerns. Again, although the Forest Department has tended to adopt a conciliatory approach towards native groups, and natives have effectively resisted logging in small pockets of forests, the absence of an adequate Dayak representation in government has meant that there is little pressure exerted on the Forest Department to change its general stance of emphasising timber functions above native customary rights in forests.

In terms of the incentive to specify rights, information on the value of timber is derived from commercial logging; the net benefits of timber can be measured from timber markets, and accrue directly to the state (including Forest Department), concessionaires (politicians), and logging companies. On the other hand, the net benefits of native burial grounds cannot be easily monetised¹⁵¹ and damage to burial grounds does not impact directly on political and bureaucratic concerns unless native organise blockades and SAM spreads negative publicity through the media which would result in reductions in timber profits and timber revenues. This occurred in 1987 and 1989 when the continued violations of native rights resulted in massive blockades. In 1989, nearly half of all logging operations were shut down because of these blockades (Chala, 1993),¹⁵² imposing serious financial costs on Sarawak. Such considerations have to be taken into account by the state

¹⁵¹ Native groups would also be encouraged to exaggerate the impacts of non-enforcement of native burial grounds on native livelihood as they would not be bearing the costs of implementing a better enforcement regime on protecting native burial grounds and shrines.

¹⁵² Chala, *op. cit.*, p. 89.

in deciding to specify rights to commercial timber at the expense of rights to native burial grounds.

Estimates can be made on the likely impact of blockades in disrupting logging and reducing timber profits and government timber revenues. Timber generates an annual revenue of over RM 700 to 800 million of royalties to the Sarawak Forest Department, and a annual profit of RM 8.4 billion (RM 21,000 per ha \times 400,000 ha) to logging operators which helps to provide political support for the state government. On the other hand, the costs of enforcing legislation to protect native burial grounds have to be borne by the Forest Department (and the state); they can be estimated using the costs of ground surveys, costs of supervising harvesting operations, and imposing penalties through courts. Such costs have been tabulated in Appendix 5.2 of Chapter Five.

Besides the benefits of timber in building up political support, revenues from timber itself (royalties and taxes) are very important for achieving development (48 per cent of total state revenue in 1990) in terms of funding industrialisation, plantation agriculture, the and infrastructure of the state. Sarawak gets to keep all timber revenues whereas petroleum and gas revenues go directly to the federal government (King, 1993). Thus state government emphasis on timber revenues is also closely connected to the federal-state financial relations. The federal government distribution of funds has been biased towards West Malaysia (Wee, 1995). Sarawak cannot rely on Kuala Lumpur to provide sufficient resources for development. Timber is therefore an extremely important resource for Sarawak's industrialisation programme as it provides the capital required for such programs.¹⁵³ The other importance of the timber industry is its role as the base for the development of timber processing industries. Government initiatives to downstream processing have led to the paid-up capital for wood-based manufacturing industry increasing from RM 4.2 million in 1981 to RM 3.1 billion in 1990.¹⁵⁴ All in all, forests are seen as an important revenue source which provides direct and excludable benefits to politicians and bureaucrats. It is therefore not surprising that rights to timber benefits are emphasised above rights to other forest functions.

¹⁵³ Figures available in Bugo show that timber has provided on average 47 per cent of the state revenue needed to finance government development programs for the years 1988-1991. See Bugo, *op. cit.*, p. 236.

Time horizon over which benefits are realised and the discount rate applied to the future benefits and costs also affect incentives of the state government in specifying rights to particular forest functions (Wills, 1997). Decision making based on maximising votes and satisfying the desires of the voting community over a five year electoral cycle normally means that the short term commercial benefits of forests will be given more weight than benefits that stretch over many years or generations. For example, the preservation of biodiversity presently has predominantly non-commercial, global, and long term benefits, most of which do not accrue to current Sarawak voters. In the case of native graveyards, the benefits are non-commercial and accrue to a specific native community. Current politicians will heavily discount the benefits of such forest functions. Thus definition and enforcement of rights to biodiversity and native graveyards will contribute far less to the political support of current Sarawak politicians than will definition and enforcement of rights to timber.

¹⁵⁴ *ibid.*, p. 237.

Chapter Seven

Summary and Conclusion

7.1 Forest Conflicts and the Lack of Social Coordination

The focus of this thesis is on examining conflicts that have arisen from the use of forests in Sarawak. Conflicts have emerged due to unclearly specified forest property rights, when logging was becoming more and more intense from the 1980s through to the 1990s and was encroaching on other forest functions. Section 7.2 discusses the main findings of this study. Section 7.3 considers the limitations and contributions of this study. Section 7.4 suggests areas for further research. Section 7.5 discusses the practical implications for forest management, following the analytical framework outlined in Chapter Two.

Sarawak's forests have many uses, both conflicting and complementary, which are of concern to interest groups within and outside Sarawak. The key to understanding conflicts arising from the use of forests is a recognition of the importance of property rights specification in laying down the rules of coordination between different forest users, and an examination of barriers that have led to incomplete property rights specification. In doing so, this study has set out to analyse conflicts over the use of Sarawak's forests using the concept of social coordination which originated from Hayek (1948), and is expanded by Wills (1997).

The analysis of the lack of coordination and conflicts arising over the use of Sarawak's forests, is based on three hypotheses. The first hypothesis is that information on values attached to the various forest functions, and comprehensive incentives to consider concerns of all groups interested in forests, are missing because property rights have not been well defined and enforced for the various forest functions. The second hypothesis is that property rights to forest functions have not been well defined and enforced because of the higher costs associated with a clearer specification of rights. Where rights to forest functions have not been defined or enforced, even when specification costs are low relative to benefits, it is necessary to examine information and incentives faced by politicians and bureaucrats involved in supplying property rights to forests, and by interest groups who

demand particular specifications of property rights. This leads to the third hypothesis, based on public choice theory, which explains property rights specification as an outcome of demand and supply in a political marketplace.

The analysis required to test the hypotheses has been carried out in four distinct stages, corresponding to different parts of the analytical framework outlined in Section 2.6.

1. Identification of forest functions and groups interested in the various functions: part a of the analytical framework in Section 2.6 (Chapter Three - hypothesis one).
2. Examination of the definition and enforcement of property rights for forest functions deemed important by the various interest groups in Sarawak: part b (Chapter Four - hypothesis one).
3. Investigation of the costs of defining and enforcing property rights for each forest function: part c (Chapter Five - hypothesis two).
4. Examination of the interaction between political decision makers (suppliers of property rights) and interest groups (demanders of property rights) in determining the stance of property rights specification: part d (Chapter Six - hypothesis three).

7.2 Main Findings

The main findings from each of the chapters, and the results of the hypothesis testing, are summarised below. The relevant hypotheses are stated at the beginning of each sub-sub-section.

7.2.1 Identification of Forest Functions and Interest Groups

Hypothesis one: Social coordination is lacking because information about forest function values is not incorporated, and comprehensive incentives not provided to the various interest groups, to allow the concerns of all groups to be included and traded-off in decision making. This has arisen because property rights to each forest function have not been clearly defined and enforced.

Seven major forest functions have been identified. Forests provide commercial timber supplies, areas for shifting cultivation, edible and non-edible forest products, territories for human abode and native graveyards, areas for ecological conservation; they prevent soil erosion and regulate water flows, and provide recreation and tourism spots. Timber benefits are of relevance to the state government, the Sarawak Forest Department, concessionaires, contractors, subcontractors, and, to a lesser extent, native communities. The benefits of shifting cultivation, edible and non-edible forest products, and native abodes and graveyards accrue to natives throughout Sarawak; a concern for such aspects also being shared by SAM. Ecological systems are the concern of WWFM, while, another forest function, that of regulating water flows and preventing soil erosion, is of concern to WWFM, ITTO, and SAM. Last, the benefits of recreation and tourism are of concern to the Sarawak Forest Department and the tourism industry.

7.2.2 Definition and Enforcement of Property Rights

Information about forest function values and incentives to coordinate the allocation of forest functions was incomplete for the commercial timber forest functions and functions valued by natives. This has arisen because of a lack of clear definition and strict enforcement of property rights for these functions, and has led to conflicts between the timber industry and natives over forest use. This is so despite the facts that native groups comprise forty percent of the total population in Sarawak and nearly half of Sarawak's forests had been logged at least once by the early 1990s.

There are three main reasons for the lack of definition and enforcement of forest property rights. First, the absence of clearly defined, standardised procedures for revocation of native customary rights by the Government, and of adequate rates of compensation for such revocations; second, slow progress in carrying out formal ground surveys over the unsurveyed sixty percent of Sarawak's area, necessary to establish the traditional and informal native customary rights to forest land; and third, inadequate enforcement by the Forest Department of regulations governing both logging and shifting cultivation. In particular, inadequate enforcement of Forest Management plans has led to unlawful encroachment by logging companies into native customary areas (active and fallow

shifting cultivation areas, native abodes, and graveyards), and the destruction of edible and non-edible forest products in timber areas as reported in Chapter Four. The lack of consideration for the concern of native groups led to protests in the affected areas in the early 1980s, which culminated in widespread logging blockades in 1987.

A further contentious issue is non-recognition of property rights in primary jungles: *menoa* land which was traditionally recognised by the native communities themselves for their subsistence needs, but not defined in the Forest Ordinance. This has also led to angry reactions from natives, when traditional native rights to such areas are "revoked" during the process of gazettelement. The inconsistency between modern legislation and traditional customary rights suggests the need to have a structure of property rights that properly accounts for customary native rights in forests. On the other hand, native groups have sometimes taken advantage of the inadequate enforcement of legislation, by carrying out illegal shifting cultivation in National Parks (NP). This has, in turn, affected the conservation activities of the state, and the concerns of conservation groups (notably WWF, Malaysia).

The property rights embodied in timber harvesting concessions are also ill-defined. Renewals are *ad hoc* and not based on any standardised criteria. Most if not all licences during the period under study have been awarded to promote political alliances and, as such, could be revoked for political reasons. In 1987, the Minister of Resource Planning was given discretionary powers to revoke concessionaires' rights under the "public interest" clause.¹ Even before the revocation clause came into existence, the Sarawak Timber Association pointed out that the uncertain guarantees of renewals have often led to intense pressure to log the whole concession before expiry of the lease, leading to substantial overcutting in some areas.

Understaffing in the Sarawak Forest Department is a major cause of inadequate enforcement of the forest property rights embodied in the Department's Forest Management and Forest Engineering Plans. As a result, nearly all forest concessions

¹ The term "public interest" being so broad that it could have encompassed any issue that the government considered important.

experience illegal re-entries into logged coupes, damage of protected species of trees, and soil erosion and river pollution which encroached on the concerns of native groups, SAM, WWFM, and the ITTO.

7.2.3 Economic Barriers: Costs of Specifying Rights

Hypothesis two: Information about the value of some forest functions and the incentive to respond to other groups' concerns are lacking because the inherent characteristics of forests have made it too costly to define and enforce property rights to the various forest functions.

The costs of definition include the costs of ground surveys to map forested areas, of regular maintenance of boundaries, and of forest inventories required to measure/record timber content, native products, and biodiversity. The costs of enforcement include the costs of supervision of all forest areas and of penalising offenders. The estimates made in Chapter 5 indicate that the costs of enhanced definition and enforcement of Sarawak forest property rights could add up to between 390 and 945 percent of the Total Recurrent Expenditure of the Sarawak Forest Department for the first year (involving initial forest inventories), and 190 to 740 percent in subsequent years.² The money costs range from RM 90.21 million to RM 216.64 million for the first year, and between RM 43.7 million and RM 170.10 in subsequent years when inventories are no longer necessary. However, these enhanced definition and enforcement costs only represent a minor fraction of total government revenues collected from timber, which have amounted to RM 700 to RM 800 million per year in the 1990s. This supports the contention that a more precise definition and enforcement of property rights is feasible in a conventional budgetary sense. There is further justification for an increase in specification activity if the modest percentage of timber rent captured by the state is taken into account (Tables 5.5 and 5.6); it is estimated that in the 1990s between thirty and eighty percent of the economic rents from Sarawak timber harvests accrued to the timber industry and timber concessionaires. Some of this revenue could be shifted to financing of better definition and enforcement of forest property rights.

² Costs figures for each year varies depending on the frequency of supervision and monitoring activities.

Since the 1980s the Malaysian Federal Government has placed limits on the budgets of Malaysian government departments; thus the costs involved in better forest property rights specification may face objections from the Federal Government which aims to trim and not expand the public sector. Budget increases have, however, been approved in the past; the Sarawak Forest Department was allowed to increase expenditure in the early 1990s in line with the ITTO (1990) recommendations.

7.2.4 Political Barriers: Demanders and Suppliers of Property Rights

Hypothesis three: Given that the economic costs of specifying property rights were not prohibitive relative to timber revenues, the political costs and benefits faced by interest groups (demanders for property rights), and political decision makers (suppliers) may cause property rights to be defined and enforced in ways which fail to take account of all interest groups' concerns.

Demand for property rights: The desire for a respecification of forest property rights is motivated by perceived gains and/or losses arising from a disturbance in the previous status quo in forest use. Timber price increases in the 1980s, and timber supply shortfalls in Peninsula Malaysia and Sabah, led to increased timber harvests in Sarawak during this period. Increased timber harvests increased the scarcity and value of the non-timber forest functions in Sarawak forests. Changes in the perceived value of the non-timber forest functions led to collective action by affected groups to change the existing state of property rights specification in forests, in order to safeguard their concerns. Forest functions which provide excludable benefits will motivate the strongest demand pressures from interest groups, as free riding on the efforts of others is less possible. For example, demand for the definition and enforcement of rights to commercial timber is strongly motivated by the fact that timber concessions and licences are (if enforced) excludable.

The effectiveness of demand for changes in property rights specification depends on factors including the size of an interest group, its wealth, its links to other groups, its familiarity with local conditions, leadership skills, and the concentration of benefits to within and between groups. Larger groups, once they are effectively organised such as the STA and ITTO, have more political weight to demand a respecification of property rights.

Wealth provides more resources for a particular interest group to lobby for a respecification of property rights. For example, the ITTO has the resources necessary to carry out detailed research into the various aspects of forest management, and the ability to create a negative image of the Sarawak timber industry. This is illustrated by the significant impact of the ITTO (1990) report on Sarawak government forest policies and expenditure.

Networks of links between groups can also influence the effectiveness of demand. STA's links with politicians ensure "official" support favouring the specification of rights to protect timber revenue generation. SAM lowered its operational costs of disseminating information and increased effectiveness through its network with Friends of the Earth and other non-governmental organisations in the Asia-Pacific (APPEN). The costs of coordination were low for WWF, as its branch office (WWFM) undertook most of the "lobbying" activities and is based in Malaysia.

Capable leadership also increased the effective demands of interest groups on politicians and bureaucrats. The STA has experienced leaders, some of whom are also political suppliers of property rights or who are closely linked to political leaders. For SAM, it was Idris and Ngau who were capable grassroots leaders. Familiarity with local conditions can lower groups' operational costs and thereby increase the effectiveness of demand. SAM has a substantial local information base and a network of native contacts built over the years. WWF Malaysia's familiarity with local conditions has helped in its lobbying efforts to conserve forest biodiversity.

In Sarawak, success in lobbying for a respecification of property rights was also influenced by the concentration of benefits for individuals within a group. Ten concessionaires within the STA dominate timber operations in Sarawak, helping to reduce free rider tendencies within the STA.

Supply of Property Rights: It is the net direct benefits from commercial timber which accrue to the political and commercial interests of Sarawak politicians and their business associates, that matter most in decisions to supply forest property rights in Sarawak. These

benefits commonly take the forms of shares of timber revenues and electoral support. Politicians and bureaucrats generally give lesser priority to the specification of rights to non-timber forest functions, because benefits from these forest functions have less impact on their revenues and votes.

The spatial incidence and excludability of forest function benefits also affect the incentives and information faced by politicians and bureaucrats in supplying changes in forest property rights. Spatial incidence and excludability of forest functions substantially determine the composition, location, and commercial incentives of members in each forest interest group, which ultimately leads to different locations and concentrations of political pressure faced by Sarawak politicians and bureaucrats. For example, compare the likely responsiveness of politicians to beneficiaries of an excludable forest benefit realised locally, commercial timber, to their responsiveness to beneficiaries of a non-excludable benefit with many remote and foreign beneficiaries, forest nature conservation. Thus it is anticipated that Sarawak politicians would pay more attention to lobbying by the STA, which is made up of local, mainly urban Sarawakians with commercial interests in excludable timber (yielding votes, electoral contributions and timber taxes and royalties), and less to the nature conservation interests of more rural Sarawakians plus individuals from overseas or peninsular Malaysia represented by SAM and WWF, Malaysia.

Sarawak politicians and bureaucrats have also generally paid lesser attention to native than to urban groups as the native groups have been politically disunited and weak. However, to the extent that actions of non-local and native beneficiaries of forests have been able to impact on timber revenues and profits, their concerns have not been entirely ignored.

Historical precedent has also influenced property rights specification in the period under study. The tendency to favour rights to timber above non-timber functions since the Brooke period has continued, with native rights steadily being eroded over time. This path dependence has been reinforced by the vested interests of the state in amassing control of economic resources in Sarawak since that period, with timber interests of politicians, bureaucrats, and timber businesses having benefited directly from the timber industry in the aftermath of British rule.

There are divergences in the interests of politicians and bureaucrats in the supply of rights to forest functions. Politicians in Sarawak have been concerned with cost cutting, due to a public sector hiring freeze that was imposed by the federal government in the early 1980s. However, the Sarawak Forest Department has emphasised the urgency of expanding its staff numbers. Also the Department has been more lenient towards illegal shifting cultivators, imposing minimal fines which diverge from the stated fines in official legislation. Most departmental staff effort has also gone into preventing revenue evasion by logging companies, not towards supervision of logging operations. In spite of these differences, the Sarawak Forest Department has generally tended to cooperate closely with politicians in power.

7.3 Contributions and Limitations of the Study

- New Institutional Economics and a Case Study of Social Coordination

The new institutional economics ... builds on the literature of transaction costs, property rights, and public choice; and it requires integration of these three bodies of literature.³

This thesis utilises new institutional economics in the form of a case study of social coordination in the use of Sarawak's forests, to understand why conflicts and a lack of coordination have arisen in the use of multifunctional forest resources. The different parts of the analytical framework presented in Section 2.6 have been adapted from the economic theories of social coordination, property rights, specification (transaction) costs, and public choice, to examine conflicts over forest use occurring in the 1980s and 1990s in Sarawak. Following the suggestion raised by North (1986) above, this thesis integrates theories of transaction costs, property rights, and public choice.

Using new institutional economics (neoinstitutional economics and public choice theory), an analytical framework was developed to examine how and why disputes have arisen over the use of forests in Sarawak. This approach required the scrutiny of legislation and detailed information from published sources, to ascertain if rights have been defined and enforced for the various forest functions, to determine the associated economic costs of specifying rights, and to examine the information and incentives faced by the various groups in demanding and supplying changes in property rights. The inclusion of political decision makers in property rights specification represents a more complete approach in understanding the use of forests, as economic decisions are made, and resource use determined, as consequences information and incentives faced by politicians and bureaucrats in supplying rights.

The case study approach adopted in this thesis is useful as a building block for a more general theory of property-rights-based conflicts over the use of resources. The focus on the signalling of value information and on incentives in coordinating the use of a multifunctional resource is illuminating because this has placed the central focus on the importance of property rights specification in social coordination. This thesis also contributes to the growing literature devoted to operationalising the measurement of transaction costs in NIE.

The expanded version of neo-classical economics used here to examine economic and political activity maintains theoretical congruence with standard neo-classical theory in that it analyses and examines conflicts from the standpoint of rational choice (where individuals in political markets consistently aim to enhance their objective function). At the same time, the breakaway from the assumption of full information and a set of idealised rules or institutions embodied in conventional neo-classical economics allows property rights imperfections to be modelled to examine resource use conflicts. The thesis also focuses attention on the signalling of values and on incentives in guiding the

¹ D.C. North, "The New Institutional Economics", *Journal of Institutional and Theoretical Economics* 142, (1986), p. 235.

behaviour of interest groups and of politicians and bureaucrats who demand and supply changes in property rights.

- Usefulness of the Analytical Framework in this Study

The analytical framework developed in this thesis is not only applicable for analysing conflicts in forest use, but could also be applied for understanding coordination problems involving other multiple-use natural resources. It could serve as a tool for studying changes in resource allocation and social coordination whereby the legal structure evolves as a result of an interaction of political and economic forces in the economy. The framework also helps to explain why certain groups have been able to capture benefits in the exploitation of resources using a simple demand and supply approach.

The analytical model used in this study has more general applicability for the study of multifunctional forestry issues. Use of the model to explain conflicts over forest use involves a series of steps: identifying the various functions performed by forests, and the interest groups concerned with particular functions; determining the extent of definition and enforcement of property rights of the various forest functions; investigating economic barriers to property rights specification (in the forms of the costs of specifying rights); and investigating information and incentives faced by forest groups in demanding, and politicians and bureaucrats in supplying, property rights. Nevertheless, the framework used for Sarawak cannot be completely transplanted for a study on, say, the Amazon forests. The economic and political context of the Amazon would be different. In this respect, it is important to take into account the history and politics of the region, and to identify the main interest groups and their past influence on political decision makers, as this would affect social coordination in the use of Amazonian forests, or any other natural resources for that matter.

- Qualitative Versus Quantitative Approach

There are limitations in the use of new institutional economics in this thesis. Notably, despite the variety of ethnic and other groups interested in Sarawak forests, cultural differences have not been specifically incorporated in the public choice model used in this thesis. Given limited information about the values of the benefits and costs of property rights changes, and the political intricacies involved, a qualitative rather than a quantitative economic approach was deemed more appropriate in this study. Quantitative studies similar to those undertaken by Alston, Libecap, and Mueller in Drobak and Nye (1997), who studied conflicts in relation to changes in land values, and Libecap in Alston, Eggertsson, and North (1996)⁴ who examined changes in the specification of mineral rights in relation to changes in private net gains, could be undertaken subject to the uncovering of further quantitative data specific to Sarawak. Statistical tests using regression analysis to examine the impacts of various independent variables like timber values on property rights changes could then be undertaken.

- *Institutional and Informational Challenges in this study*

The amount of information required to identify forest functions and interest groups, and to determine the extent of definition and enforcement of property rights of the various forest functions, the costs of property rights specification, and the political information and incentives faced by interest groups and politicians and bureaucrats in demanding and supplying property rights is enormous. Interviewing the Sarawak Forest Department and representatives of the timber industry, and environmental and ecological groups was initially seen as the most suitable approach to obtain information on the enforcement of rights, and the costs of definition and enforcement of property rights. Information on the definition of rights to forest functions, on the other hand, is only available from records in the various ordinances.

Official permission was not granted for interviews in Sarawak, due to the politically sensitive nature of research into forestry issues. As a result, other means were sought to test the hypotheses in this thesis, mainly through Forest Department records, official

⁴ Originally published in the *Journal of Economic History* 38, No. 2 (June 1978).

reports and other printed sources. This involved collecting information held in libraries in Singapore, Malaysia and Sarawak, plus private discussions with researchers and other individuals familiar with the history and economic conditions of Sarawak, the study of newspaper cuttings, and personal observation whilst travelling in Sarawak. In retrospect, it was realised that the interview approach also has its limitations. For example, information on the specification costs of rights may have been unavailable from interviews with the Sarawak Forest Department.

Particular informational constraints are nevertheless present and will now be discussed. First a discussion of the informational requirements, and constraints related to parts a and b of the analytical framework. The identification of forest functions did not prove to be a problem (part a in Section 2.6 of Chapter Two). Information was available from many anthropological studies, the task nevertheless was to present such information in a manner that would allow parts b to c of the analytical framework to logically follow from part a.

Accounts of property rights definition and enforcement (part b) are available but scattered in official documents and monographs, forestry conference papers, and non-official publications. For parts b(i) and b(ii), materials related to the identification of forest functions, and identification of rights holders, precise user rights, and penalties for violations were obtained from Sarawak ordinances and regulations, and from management and forest engineering plans. Apart from the fact that such documents were not located in one library in one country, there were no other problems associated with obtaining such information.

In terms of part b(iii), interviews with some interest groups would have provided first hand accounts related to enforcement and would have reduced the time involved in research and collection of such information from published sources. It has not always been possible to obtain detailed information on enforcement for all forest functions. It would have been ideal if forest department officials could have been interviewed to obtain guidance on the types of data available, followed by interviews with logging companies, native groups and

¹ I. Wills, *Economics and the Environment: A Signalling and Incentives Approach*. Australia: Allen and Unwin Ltd., 1997, p. 323.

SAM to verify information collected from published sources. In fact, in the absence of permission to conduct formal interviews in Sarawak, verification has only been supported through informal and personal discussions with individuals familiar with conditions in Sarawak, and field notes of observations gathered from a trip made to Sarawak in 1995.

For specification costs (part c), it has not been possible to obtain full data on the costs of property rights definition and enforcement from Sarawak. Some cost information had to be extrapolated from studies undertaken on other forested areas similar to those in Sarawak, for example, from forest situations in Peninsular Malaysia. Such information gaps are not believed to affect the results and conclusions of this thesis.

The use of public choice theory to examine information and incentives faced by politicians, bureaucrats, and the various interest groups in their decision making is novel in the Sarawakian context (part d). It was not possible to directly observe political events and to interview politicians, bureaucrats, and members of interest groups about the costs and benefits that matter to them. As a result, information about decision makers' information and motivations had to be taken from newspaper reports and a wide variety of published monographs. Similarly, information on the membership of interest groups is limited to published sources. This situation may have been rectified if direct contact could have been made with some of these groups and formal interviews had been permitted. In an attempt to circumvent the interviewing restrictions, letters were written to SAM, but no replies were received. The ITTO and WWF, on the other hand, have readily provided information that was publicly available.

7.4 Areas for Further Research

Drawing from information gaps discussed above, further research should be conducted in the three areas. One is on the current status of enforcement of forest property rights in Sarawak. The second area is on the definition and enforcement costs for the non-timber forest functions. The final area is public choice issues facing interest groups, and politicians and bureaucrats in Sarawak.

First, there is a need for research into forest property rights enforcement in Sarawak in line with the information requirements put forward in part b(iii) of the analytical framework. Anecdotal evidence⁶ suggests that current forest use and attendant conflicts are similar to those in the late-1980s to the mid-1990s, the period under study in this thesis. A systematic study of the enforcement of rights would be timely, in order to assess the current shortcomings in enforcement which hinder social coordination.

Second, there is a need to undertake surveys to better ascertain property rights definition and enforcement costs for the less commercial forest functions like biodiversity, native edible and non-edible forest products, and soil erosion and watershed supply. Such research has been conducted by WWF and ITTO in the past, but it needs to be updated. Both information on specification costs and value of forest functions are central to the issue of social coordination in this thesis. The identification of costs allows for more concrete arguments to be presented to explain economic barriers to social coordination, while valuing forest functions is important to provide accurate information signals to the various interest groups.

Lastly, in terms of political barriers to improved property rights specification, which forms part d of the analytical framework, more systematic research needs to be undertaken to identify political gainers and losers, to identify factors influencing the effectiveness of interest groups as demanders of property rights, and to identify factors affecting the information and incentives faced by politicians and bureaucrats. As public choice research is yet to be extensively conducted on Sarawak, there are numerous opportunities for pursuing research in this area. In addition, research into the ownership of and interests in forest concessions would help to clarify public choice issues in part d by providing better evidence on how incentives have been skewed towards protecting rights in timber. Political barriers to the collection of such information might be overcome if pressure is exerted by ITTO or by the developed countries for such information to be made transparent. This will not change the results of this study but could add more rigour to the

⁶ See, for example, "Anwar Lodges Police Report over Bakun Dam Corruption: Prime Minister and Finance Minister among Top Officials Named" in <http://www.rengah.c20.org/news/19991112.htm>. Dated 12 November 1999. Retrieved on 27 November 1999, and "Urgent Appeal by Affected Longhouse

analysis. Such results would permit more rigorous use of new institutional economics to examine incentives faced by politicians in supplying property rights.

7.5 Practical Implications for Forest Management

The first part of this section focuses on measures to improve forest management by better definition and enforcement of property rights. The second part discusses ways of improving the public decision making processes related to forest management. Finally, the policy suggestions made will be considered in relation to the impediments to change posed by the vested interests of the Sarawak timber industry, politicians and bureaucrats.

Improvements in Property Rights

A focus on the signalling and incentive mechanisms for coordinating the use of forests can lead to a better understanding of the causes of forest conflicts, and hence to modifications of existing forest policies and regulations to improve social coordination. The advice provided to Sarawakian policy makers by ITTO (1990; 1994c) and WWF Malaysia has moved policies and regulations in this direction, but much remains to be done. For example, the ITTO (1990) mission did not deal with the cost aspects of property rights specification, nor did the ITTO recommendations consider native interests and communal rights in detail, although the environmental impacts of logging were very carefully examined.

Six measures to achieve better definition and enforcement of forest property rights are considered below: better identification, definition, and enforcement of rights to edible and non-edible forest products; ground surveying forested areas prior to logging; additional measures to safeguard biodiversity; changes in the Management and Forest Engineering Plans to better protect non-timber interests in forests; better enforcement of Management and Forest Engineering Plans; and better training for forest managers who define and enforce property rights. Together, these measures reflect the need to take into account the

Communities: Niah Longhouse People Protest Against Land Encroachment" in <http://www.rengah.c20.org/news/19990712.htm>. Dated 12 July 1999. Retrieved on 27 November 1999.

fact that Sarawak's forests are multifunctional, providing a variety of inter-related benefits to a variety of groups in the community.

Rights to Edible and Non-Edible Forest Products

Natives comprise forty percent of Sarawak's total population, and around eighty percent of them depend on forests for their subsistence. Management policies which emphasise the importance of clearly defining and enforcing forest property rights of concern to natives are therefore an important prerequisite for social coordination in the use of Sarawak's forests.

First, the traditional informal rights and norms observed by native communities need to be incorporated into formal legislation, to narrow the present discrepancies between current legislation and informal and traditional native rights to forest products. The ITTO interviews with the various native groups throughout Sarawak, reporting on the destruction of edible and non-edible forest products by logging companies, indicate that any future management policies must place emphasis on protecting forest functions valued by native groups. Notably, there has been no specific legislation that has recognised the importance of wildlife for native subsistence in PFEs, and there are no provisions in Forest Management Plans to prevent loggers hunting game. Such oversights have often laid the ground for conflicts of interests between loggers and native groups. Also, although some edible and non-edible forest products are protected in legislation, there has been almost no enforcement to protect such products from destruction by logging operators. In addition, new research must be undertaken to identify edible and non-edible forest products that continue to be important to native communities.

Second, social coordination will also be enhanced if moves are taken to constitute additional Communal Forests -- areas set aside for meeting the subsistence needs of native groups, including areas expressly set aside for hunting wildlife. During the period under study, it was often reported that the allocation of forested land for communal needs was insufficient to cater to native needs throughout Sarawak. Any new policy geared towards the provision of edible and non-edible forest products should be carried out only after

careful consultation with native groups throughout Sarawak. Of course, any policy measure also has to be weighed against its potential costs, including losses in timber revenues, taxes, and political patronage and votes.

- *Ground Surveys*

It is important to ground survey forested areas as soon as possible, in order to identify areas of fallow shifting cultivation, which would reduce disputes over land claims. A ground survey of forested areas would enable logging companies to take into account the existence of fallow forest areas and to avoid any intrusion into these areas. According to the Sarawak Land and Survey Department, around thirteen percent (1.63 million ha) of the total native customary land is "scattered and fragmented throughout the state."⁷ Also there should be a longer time period for natives to communicate informal land rights to the authorities during the process of gazettelement of forested areas into PFEs or other land uses. The need for more time provision is due to the inaccessibility of information about gazettelement for native groups living in the deep interior. To improve the chances of identifying more inaccessible or harder-to-identify fallow areas of shifting cultivation, official communication could be established between native groups, officials, and loggers, perhaps one year before formal surveys are conducted.

In the case of destruction of shifting cultivation areas (active and fallow) and native graveyards, compensation in kind could be made, such as the offer of alternative plots of land and the observance of religious and cultural procedures by the offending party when sacred burial sites have been unintentionally violated. The procedures establishing compensation rates and compensation procedures should be spelled out in legislation. Standardised rates of compensation need to be clearly set out legislatively; such rates were non-existent during the period under study.

⁷ P. Songan, and A. Sindang, "Identifying the Problems in the Implementation of the New Concept of Native Customary Rights Land Development Project in Sarawak through Action Research" in Leigh, M., editor, *Borneo 2000: Environment, Conservation and Land*. Proceedings of the Sixth Biennial Borneo Research Conference, Organised by the University Sarawak Malaysia and Sarawak Development Institute, Kuching Sarawak July 10-14, 2000, p. 251.

The process of issuing formal land titles for land held under native customary rights continues to be a problem. Land Officers have had difficulty in recognising the social, cultural and economic nuances of traditional ownership (for example, *menoa*, which is not accorded recognition as an alienable right in the current land laws). This leads to conflicts when such areas are being encroached upon. There is a need for further research into native perceptions of traditional rights and into the economic and non-economic values attached to native land before legislating for the registration of traditional ownership rights. Such research would serve to clarify land ownership issues and expedite the formal process of registering traditional ownership rights. The concerns of native communities would include the preservation of land for its subsistence, economic, cultural (stewardship and heritage) and religious functions, and its protection from outside encroachment. Even in modern times, there remains a strong cultural and sentimental attachment to land due to native dependence on land resources for their livelihood.⁸

Conservation of Biodiversity

Due to inadequate knowledge of the plant and animal species in Sarawak's forests, it is very important to continue to expand the identification, definition, and enforcement of property rights related to the conservation of biodiversity in the state. Areas allocated to the protection of mangroves and peat swamp species in wetland forest areas, in particular, organisms and plant forms in river beds, are inadequate. There is a need for a specific plan to protect mangrove forests; during the period under study, there was no plan in place to protect these forests.⁹

The conservation of biodiversity also requires research expeditions to identify new plant and animal species, in order to build on the inadequate database of species in Sarawak. This also requires the participation of native communities, as indigenous knowledge of plants and animals is an important conservation aid. Regular monitoring of existing

⁸ See D. Ngidang, "A Clash between Culture and Market Forces: Problems and Prospects for Native Customary Rights Land Development in Sarawak" in Leigh, M., editor, *Borneo 2000: Environment, Conservation and Land*. Proceedings of the Sixth Biennial Borneo Research Conference, Organised by the University Sarawak Malaysia and Sarawak Development Institute, Kuching Sarawak July 10-14, 2000, p. 247.

⁹ This was pointed out in Section 3.2.5 of this thesis.

species is also needed to ensure that known endangered species are protected; this is not the case at present due to understaffing in the National Parks and Wildlife Section of the Sarawak Forest Department.

There is also a need to expedite the process of gazettement areas as National Parks and Wildlife Sanctuaries. During the period under study, only 2.04 percent of Sarawak's Forest land was gazetted as Totally Protected Areas (TPAs). Another six percent which have been identified as potential conservation areas) was still undergoing various stages of gazettement at a pace which is too slow compared to the rate of logging in Sarawak. Adequately trained staff to ensure the proper running (research and management) of TPAs are another important prerequisite. This can only be rectified when there is adequate funding available for the recruitment of qualified professional staff.

The security of tenure for TPAs is inadequate at present. The process of degazetting TPAs must be subject to stringent checks, and not be determined just on purely economic considerations such as the returns from commercial agricultural programmes. This requires that conservation and biodiversity information from the WWFM and the National Parks and Wildlife Section of the Sarawak Forest Department must be seriously considered before proceeding with moves to degazette a particular TPA. Better still, EIAs could be mandatory for all TPAs that are in the process of being degazetted.

- *Definition of Management and Forest Engineering Plans*

As logging has cleared nearly 400,000 ha of forests per year in the 1990s, with major impacts on the concerns of non-timber interest groups, there must be greater consideration of such impacts in formulating future Management and Forest Engineering Plans of the Sarawak Forest Department. Before new plans are made, it is necessary to identify the current issues of concern to non-timber interest groups regarding logging practices in Sarawak, to quantify the impacts of logging practices on native communities, environmental and conservation groups, and to reorient Management and Forest Engineering Plans to deal with non-forest interest group concerns. In view of the constraints imposed by present and proposed budgets for monitoring and enforcement, it

will be necessary to prioritise the problems of non-forest interest groups. Useful studies which provide a clear and succinct overview of these issues are ITTO (1990), ITTO (1994a), and Kavanagh, Rahim and Hails (1989). Such works could be used as a starting point in beginning the redesign of Management and Forest Engineering Plans.

- *Enforcement of Management and Forest Engineering Plans*

Even if rights for the various forest functions are comprehensively defined, a lack of enforcement undermines the value of property rights in coordinating the use of resources.

There is a particular need for policies to strengthen the enforcement of the Management Plans and Forest Engineering Plans designed to control the activities of logging companies. While penalties for infringements have increased since 1993, a lack of supervision due to understaffing in the Forest Department has led to a disregard of existing regulations by logging companies which, in turn, has impacted on the interests of native communities who depend on forests for their subsistence and livelihood. Scant supervision has also contributed to a disregard of ecological and hydrological functions of forests by loggers. Soil erosion and water pollution are evident in most freshly logged areas as reported in ITTO (1990). Thus an important priority would be to increase staffing levels in sections of the Forest Department that are responsible for supervising timber harvesting operations.

Lack of funding for staff is not the only factor hindering forest monitoring activities. ITTO (1994c) reported a lack of commitment by Sarawak Forest Department staff as a serious problem, manifested by a lack of professionalism and incentives to perform the job according to the prescriptions set out in the Management and Forest Engineering Plans.¹⁰ Devising schemes to reward staff when they detect and penalise infringements could be

¹⁰ International Tropical Timber Organization (ITTO). *Pre-project Report: Manpower Development of Sarawak Forest Sector*. Ref. No.: PCI(VII)/7. Prepared by the Forest Department, State Government of Sarawak, Malaysia, 1994c. The lack of professionalism is defined as a lack of social responsibility and personal drive to do the job regardless of the incentives. See *ibid.*, p. 30. The lack of commitment of staff in the Sarawak Forest Department has been discussed in Chapter Four of this thesis. For prescriptions and conditions set out in a typical Management Plan, please refer to Appendix 1 in ITTO (1996).

one means to overcome this limitation; ITTO suggested offering bonuses and pay rises in line with infringements detected.¹¹

Another option to improve forest monitoring would be to offer contracts to private sector firms. Offering contracts to staff in the private sector based on their monitoring performance, including detections and prosecutions, may be another option to overcome Forest Department inertia. Monitoring performance criteria would be based on the standards set out in the Management and Forest Engineering Plans.¹² It would be necessary to check the performance of such contract staff (perhaps ITTO could serve in this capacity by providing funding for independent "forest guardians" to carry out surprise audit checks on the activities of such contract staff).

The effectiveness of Sarawak Forest Department enforcement activities would be further enhanced if it could be given greater flexibility in deploying staff and increasing staff numbers. This would be contrary to the hiring freeze imposed by the Federal Government on bureaucracy since 1982;¹³ this is one political constraint which needs to be taken into account. Note, although, that in the early 1990s, this constraint was relaxed when the Sarawak Forest Department was allowed to increase staffing numbers in line with the recommendations made by the ITTO (1990) mission.

¹¹ ITTO (1994c), *op. cit.*, p. 30.

¹² Such a criterion could include the private company overseeing if felled trees are being properly logged in terms of the volume of timber removed from the stem to the crown of each tree. The criterion should also include undertaking duties to detect contraventions in relation to legislation set out in the Forest Ordinance in terms of illegal entries into already logged coupes, illegal logging, destruction of protected native products within such areas, and felling of protected species. In addition, the criteria must include ensuring that conditions agreed in each licence between the concessionaire and the Sarawak Forest Department has been complied with. This would involve monitoring road construction, a regular and timed inspection of the condition of roads, periodic inspection of the boundaries of annual coupes, checking and supervision of logging blocks prior to, during and after harvesting operations, and monitoring harvesting operations for the purposes of assessing royalties and taxes. Such tasks could come in the form of a checklist containing such tasks.

¹³ This must of course be supported by documenting and justifying why such increases are necessary in the first place. This will involve a detailed and extensive study of forests in different regions of Sarawak with a focus on quantifying, where possible, the damage inflicted on forests, and the benefits forgone by the various interest groups, due to the current state of inadequate enforcement. In addition, the revenue potential that could result from an enhanced specification of forest property rights and arising from the goodwill (local and international) generated when social coordination is enhanced should also be taken into account.

Training in Forest Management

Forest staff training is important in enhancing the definition and enforcement of property rights in forests. An effective training programme would involve several components. First, the present level of professional and non-professional staff expertise, and gaps in skills relevant to the definition and enforcement of the various forest property rights in Sarawak, must be identified. Second, there must be recruitment and training and retraining to remedy skill deficiencies.¹⁴ Table 2.1 and Appendix 5.2 of this thesis could provide a starting point in developing a checklist of skills for defining and enforcing property rights. Training would cover skills including land surveying, the proper conduct of inventories, supervision of logging operations, management of log transportation along rivers, prevention of royalty evasion, management of parks and wildlife sanctuaries, and business management in marketing timber. Third, training institutions must be identified, for example, local and international - universities and government timber training schools in Sarawak; in the case of foreign training institutions, the subject matter must be appropriate to the state of technological development in Sarawak, and to the levels of education and expertise of Sarawak staff. In this respect, it is important to link the content of the training courses to that of the experience and education of Sarawak who attend training sessions. Fourth, training must also involve a cultural component, in which forest staff are taught to be more understanding of native cultural sensitivities towards forests, so that disputes between logging companies and native communities can be settled amicably.

Improvements in Public Decision Making

Four measures to improve public decision making in the use of Sarawak's forests are considered: creation of new communication channels to improve the information received by politicians and bureaucrats; modification of the incentives faced by Forest Department staff; greater transparency in awarding future timber concessions; and greater security of future concessions.

Channels of Communication

The establishment of open formal channels of communication (eg. regular policy forums) between interest groups and political decision makers may be one avenue to further enhance social coordination among interest groups. In the absence of formal markets for some non-traded forest functions, such forums will help to take into account the values and views of natives, and environmental, conservation, and community groups. Government officials and Forest Department officers must be present to clarify and explain government and forestry policies, so as to reduce misunderstandings between concerned interest groups, and between interest groups and the state. For native groups, the existence of numerous native communal associations can serve as a basis for such communication, and also for the authorities to communicate state policies and actions on issues such as timber harvesting or the preservation of biodiversity.

Within government, there needs to be good communication between the various agencies dealing with the economic and technical (timber, tourism), social (native land needs), environmental (biodiversity, water flows, soil erosion, ecotourism), and legislative aspects of forest management. Again, Table 2.1 and Appendix 5.2 could be used as a starting checklist of activities involved in clearly defining and enforcing property rights for the various forest functions, identifying where responsibilities lie within the various government agencies, and identifying gaps in legislative coverage.

The existing integration of the National Parks and Wildlife Branch (NPWO) in the Sarawak Forest Department has also provided an avenue for conservation concerns to be communicated and incorporated into the overall strategy of forest management. Since it is essential that the various groups interested in forests be kept aware of the complexities involved in forest management, perhaps working groups concerned with different forest functions should be established under the direction of the Sarawak Forest Department to exchange views and interests, identify and determine future directions for research, disseminate research findings, and communicate such findings to the wider public. This

¹⁴ Within the state, apart from the legislature, this would involve cooperation among the Ministry of Resource Planning, Ministry of Agriculture and Community Development, Ministry of Land Development,

would also help the Sarawak Forest Department to have a coherent understanding of community demands and concerns for the various forest functions.

An increase in public awareness of forest policies and regulations is also an important tool for enforcement; creating such awareness may encourage voluntary monitoring and enforcement action by private individuals or groups concerned to protect the environment and prevent unnecessary forest degradation. WWFM already has a public awareness campaign in place throughout Malaysia. This could be further strengthened by the incorporation of environmental studies into the primary education curriculum of schools, showing documentaries on nature, wildlife, and the environment on television, publishing articles in the print media, and undertaking general public awareness campaigns.

- *Incentives Faced by the Forest Department*

The annual budget granted to the Forest Department should not be based on the revenues collected from timber alone. The logic that bureaucrats, like individuals in the market place, have stronger incentives to define and enforce property rights when such rights specification activities provide direct and immediate benefits to themselves is relevant here. The performance of the Forest Department could be measured by indicators like its success in conserving biodiversity, success in reducing disputes between natives and logging companies and success in enforcing Management Plans and Forest Engineering Plans, silvicultural and reforestation efforts, as well as by timber output and revenues collected from timber. This will require a change in mindset and the creation of indicators to measure the achievement of the various Forest Department objectives. Such indicators could be devised as a result of the Ministry of Resource Planning holding public forums with the various groups interested in forests.

- *The Issue of Transparency in the Awarding of Concessions*

Changes in forest management policies also have to be politically realistic, taking into account the current political setting in Sarawak. Distribution conflicts are likely to arise

Ministry of Environment, and Ministry of Tourism in Sarawak.

whenever a respecification of property rights involves possible undermining of political decision makers' objectives of staying in power or of increasing their support. It is not easy for this issue to be resolved, but understanding why certain rights will be given lesser priority on distributional grounds provides a better basis for policy changes. The creation of processes and forums which provide a check on the self-interest of politicians should therefore be encouraged.

One such process would be a tender system for awarding new timber concessions after the expiry of current concessions; new concessions, and perhaps also new logging contracts, could be awarded on the basis of past harvesting performance. To ensure minimal political interference, independent auditors could monitor such processes to ensure that the tender system has been strictly adhered to, thus removing the political practice of granting concessions in return for political support. In addition, transparency in the award of tenders requires standardised and publicly known criteria. The criteria could be established and reviewed with input from public forums such as those discussed previously. Admittedly, it might be difficult to motivate politicians to make such changes, due to their vested interests in the award of timber concessions. However pressure could be exerted by ITTO, WWF, and SAM for greater transparency. When there are fewer vested interests involved in the award of concessions, the supply of property rights will be more in line with the concerns of all groups interested in forests.

- Security of Tenure of Concessions

Concession leases need to be made more secure, with compensation or alternative harvesting sites offered to concessionaires if current concessions have been revoked (except in cases where regulations in the Management or Forest Engineering Plans have been violated). More secure tenure would create incentives for concessionaires to manage forests from a long term perspective. An independent body recommended by the ITTO (1990) mission should be instituted to monitor both the issuing of licenses and the supervision of logging operations by the Sarawak Forest Department, as well as the processes of revoking licenses. This independent body should be free from political influence; its task would be to ensure that the regulation of forest tenure and revocation of

concessions are carried out in accordance with legislation; it might consist of judicial representatives and knowledgeable individuals from all groups interested in Sarawakian forests. In addition, this body could be given powers to penalise violators and compensate parties adversely affected by logging activities. This would provide incentives for concessionaires to manage forests in accordance with the guidelines set by the Sarawak Forest Department.

- *An important caveat...*

This thesis has emphasised the importance of political factors in determining the prevailing stance taken on the definition and enforcement of property rights in Sarawak. Thus it is important to explicitly consider the vested political interests of the Sarawak timber industry, politicians and bureaucrats in considering the realism of the policy recommendations discussed above, and problems likely to accompany any attempt to implement the recommendations.

In order to devise practical ways of implementing policy recommendations, it is important to recognise the ultimate causes of determining the existing stance taken on property rights specification. Bromley (1999) stressed the need to identify the ultimate causes rather than the symptoms¹⁵ of tropical deforestation in order to devise policies that are effective.¹⁶ In the present study, it appears that powerful vested interests of the commercial timber industry and politicians and bureaucrats are important ultimate causes for forest property rights being specified as they were in Sarawak during the period under study.

Most of the policy suggestions above would require increases in the state budget for the Forest Department. Sarawak government revenues from timber royalties and taxes are sufficient to cover such demands. However, as pointed out in Chapter Six, the negative impacts on the objectives and vested interests of powerful interest groups in Sarawak (reductions in returns to commercial timber interests and erosion of politicians' political

¹⁵ Symptoms of deforestation include rapid timber extraction, slash-and-burn agriculture, plantation forestry, rapid population growth, cattle ranching, fuelwood gathering.

¹⁶ D. W. Bromley, *Sustaining Development: Environmental Resources in Developing Countries*. UK: Edward Elgar Publishing Limited, 1999, p. 275.

power and support) appear to have prevented a more precise specification of non-timber property rights. That a major change in the prevailing stance of property rights might be accompanied by a redistribution of power away from such groups is therefore an important issue that has prevented the specification of more precise forest property rights.

If the existing stance of property rights definition and enforcement is to be changed in line with the policy changes suggested above, there must exist a check-and-balance system that will ensure that the concerns of all and not just timber groups and politicians are taken into account. This will be a very difficult task, but civil interest groups and NGOs like the various native associations, ITTO, WWF, and SAM could play a crucial role in moving the state to improve the present legislation on the environment and legislation protecting native rights (that is, legislation covering the social functions of forests). This again suggests steps to improve the channels of communication between the various interest groups and the State Government and the Sarawak Forest Department. The resulting feedback could help in drafting new legislation more relevant to native, conservation and environmental groups.

In order for the concerns of different forest interest groups to be recognised and arbitrated, there must be a judicial system independent of the ruling government, where legislation will be enforced according to the rule of law.¹⁷ By this is meant that any individual (including the government) has recourse to settle disputes in forest use through the courts, and there is an institutional structure "... in place to force the unwilling to follow the law."¹⁸ Such a formal structure already exists in Sarawak and Malaysia, but the courts have not always been perceived to be independent of political influence, and they do not have the administrative capacity to handle the number of civil cases brought to them, because of a lack of sufficient funding.¹⁹ As such, this "institutional anchoring" (the term which Bromley uses),²⁰ is not yet fully in place in Sarawak. The definition and enforcement of forest property rights in the state will be more effective when such a legal arrangement is established.

¹⁷ *ibid.*, p. 280.

¹⁸ *ibid.*

¹⁹ See Hong (1987) and *The Battle for Sarawak's Forests* (1990) for instances of both.

²⁰ Bromley, *op. cit.*, p. 280.

All in all, swift policy measures to enhance social coordination over Sarawak's forests cannot be taken for granted. Too many vested interests are at stake; nevertheless, understanding why the situation has developed as it has represents a first step towards resolving such issues. The importance of vested self interests and power cannot be taken lightly. Changes in mindset may also take some time to occur. Having said that, not all behaviour can be explained in terms of self interests alone; other considerations like cultural values and ideologies, not discussed above, may also affect the future use of Sarawak's forests.

APPENDIX 1.1: Value of Principal Exports of Sarawak: 1966 - 1995 (RM)

Year/Item	Agricultural Products ('000 RM)	%	Timber* ('000 RM)	%	Petroleum & Products ('000 RM)	%	Other Goods ('000 RM)	%	Total ('000 RM)
1966	91,818	20	108,813	23	241,472	52	21,471	5	463,574
1967	76,794	15	136,019	27	263,977	53	26,193	5	502,983
1968	83,024	14	181,066	30	298,718	49	41,511	7	604,319
1969	110,818	17	186,539	29	301,975	47	42,677	7	642,009
1970	106,550	16	198,217	29	326,995	49	41,018	6	672,780
1971	89,796	11	167,862	21	479,581	61	53,961	7	791,200
1972	83,070	14	134,457	22	321,113	53	68,479	11	607,119
1973	159,232	19	210,848	25	392,200	47	72,181	9	834,461
1974	176,852	13	165,888	12	953,659	67	89,502	6	1,385,901
1975	158,585	11	125,913	9	1,025,319	74	77,578	6	1,387,395
1976	226,160	10	359,050	16	1,532,241	69	104,650	5	2,222,101
1977	266,519	12	343,585	16	1,423,191	66	120,522	6	2,153,817
1978	276,466	14	399,505	21	1,068,098	56	164,518	9	1,938,587
1979	313,694	10	911,743	30	1,624,440	53	235,995	8	3,085,872
1980	300,455	7	920,447	23	2,515,216	62	305,305	8	4,041,423
1981	218,268	5	897,157	20	3,017,878	67	384,003	9	4,517,306
1982	202,713	4	1,363,449	28	3,054,673	62	335,768	7	4,956,603
1983	235,688	4	1,179,360	20	4,110,464	69	437,585	7	5,963,097
1984	264,403	3	1,327,930	17	5,316,798	70	739,837	10	7,648,968
1985	313,630	4	1,462,312	17	5,946,133	70	724,754	9	8,446,829
1986	364,873	4	1,389,363	22	3,577,466	57	907,817	15	6,239,519
1987	421,012	7	2,031,870	27	4,057,435	53	1,085,540	14	7,595,857
1988	477,059	6	1,997,265	28	3,849,269	53	895,024	12	7,218,617
1989	445,199	6	2,867,589	32	4,639,923	52	1,026,681	11	8,979,392
1990	389,436	4	3,134,603	28	6,255,346	55	1,504,144	13	11,283,529
1991	376,302	3	3,527,846	27	6,894,393	53	2,227,413	17	13,025,954
1992	377,737	3	3,522,328	28	5,923,364	47	2,673,671	21	12,497,100
1993	383,476	3	3,745,705	30	5,463,053	43	3,017,814	24	12,610,048
1994	544,427	4	3,702,489	27	5,466,230	41	3,757,123	28	13,470,269
1995	702,375	4	3,510,491	22	6,847,843	44	4,598,501	29	15,659,210

Source: *Agricultural Statistics of Sarawak 1975, Agricultural Statistics of Sarawak 1980, Agricultural Statistics of Sarawak 1985, Agricultural Statistics of Sarawak 1991, Agricultural Statistics of Sarawak 1995*, Sarawak: Planning Division, Department of Agriculture, Kuching. (* Includes sawlogs and sawn timber)

Appendix 3.1 Timber Exports and Revenue

Year	Total Export Value (RM'000) (Sawlogs, Sawn Timber, and Timber Products)	Revenues (RM'000) (Royalties and Permits; Premium, Fees and Services (Nat. Parks); Export Duties; Timber Cess; Timber Devt. Premium; Rehabilitation and Devt. Fund)	Revenues/ Total Export Value (%)
1981	897,235	212,492	23.7
1982	1,395,606	273,343	19.6
1983	1,093,453	402,867	36.8
1984	1,382,202	345,983	25.0
1985	1,515,282	342,948	22.6
1986	1,454,404	352,244	24.2
1987	2,106,108	514,001	24.4
1988	2,106,554	525,360	24.9
1989	3,008,225	674,906	22.4
1990	3,342,142	734,832	22.0
1991	3,849,809	693,364	18.0
1992	4,131,512	709,704	17.1
1993	5,140,909	725,998	14.1
1994	5,664,119	864,382	15.3
1995	5,468,256	996,603	18.2

Source: *Annual Report of the Forest Department Sarawak, Various Years.*

Appendix 3.2
Estimated Price of Sawlogs (Based on Export Value/Volume)

Year	Export Value (RM'000)	Volume Exported (m ³)	Estimated Price (RM/m ³)
1981	812,357	6,923,178	117.34
1982	1,262,454	9,205,210	137.15
1983	1,093,300	9,170,865	119.21
1984	1,227,118	8,981,224	136.63
1985	1,403,411	11,485,991	122.18
1986	1,290,814	10,262,855	125.78
1987	1,905,942	12,645,834	150.72
1988	1,849,707	12,293,200	150.47
1989	2,670,402	14,960,294	178.50
1990	2,882,893	15,898,212	181.33
1991	3,143,518	15,819,191	198.72
1992	2,971,667	15,819,191	187.85
1993	2,868,057	9,126,980	314.23
1994	2,543,445	8,417,201	330.93
1995	2,262,207	7,744,930	342.36

Source: *Annual Report of the Forest Department Sarawak, Various Years* and Malaysian Timber Council ([http://www.mtc.com.my/fpub/statistic/...](http://www.mtc.com.my/fpub/statistic/))

Appendix 3.3
Sawlog Timber Production in Sarawak

Year	Sawlog (m ³)
1981	8,697,358
1982	11,243,177
1983	10,564,528
1984	11,401,828
1985	12,285,328
1986	11,470,689
1987	13,655,190
1988	14,386,748
1989	18,162,578
1990	18,837,760
1991	19,410,903
1992	18,848,225
1993	16,735,011
1994	16,317,683
1995	16,105,914

Source: *Annual Report of the Forest Department Sarawak, Various Years* and Malaysian Timber Council ([http://www.mtc.com.my/fpub/statistic/...](http://www.mtc.com.my/fpub/statistic/))

Appendix 3.4 Forest Functions and Interested Groups

Forest Function	Interested Group	Location	Source:
<i>Commercial Timber</i>	State, Forest Department, Concessionaires, Contractors, Sub-Contractors, ITTO	Throughout Sarawak But Concentrated in Miri and Kapit Divisions	Annual Reports of the Forest Department Sarawak (various years); Bugo (1995); ITTO (1990, 1994a, 1994b, 1994c); Bevis (1995); Chala (1993); Hong (1987); Kavanagh, Rahim, and Hails (1989)
<i>Shifting Cultivation (On Average 30 Percent of Forested Areas Including Fallow Areas. Main Crop Planted is Rice Interspersed with Fruit Trees and Vegetables)</i>	All Natives [Excluding Nomadic Penan and Kajang]		
	Native Groups in General	Sarawak in General	Bugo (1995)
	Iban	Mukah-Anap Region in the Sibu Division	ITTO (1995)
	Iban	Lubok Antu, and Paku (Saribas)	Kedit (1980)
	Iban	Batang Kemena and Batang Tatau in the Bintulu Division	Taylor, Hortin, Parnwell, and Marsden (1994)
	Iban	Bintulu Division	Parnwell and Taylor (1996)
	Iban	Rejang Valley (Second Division)	Sutlive (1992)
	Bidayuh	Teng Bukap (Kuching)	Burgers (1993)
	Orang Ulu [Kenyah, Kayan, Lun Bawang, Penan, Bisaya, Kelabit, Others]	Kapit, Bintulu, Miri, and Limbang	Seling and Langub (1989)
	Orang Ulu are defined as non-Muslim indigenous groups who are not Iban, Bidayuh or Melanau. Geographically, they reside in the interior of north-eastern Sarawak in Kapit, Bintulu, Miri, and Limbang Divisions; pp. 20-21.		

	The Kenyah and Kayan form the largest number of Orang Ulu.		
	Kenyah	Long Selatong Ulu in Baram	Chin (1985)
	Kenyah	Baram River (Miri) and Balui River (Kapit)	Sagan (1989)
	Kajang	Belaga District	Luhat (1989)
	The study of the Kajang in Belaga by Luhah consists of the Punan, Kejaman, Sekapan, and Lahanan, Seping and Bemali. The term Kajang is also applicable to other smaller groups like the Sihan, Ukit, Taljong, Kanowit and the Bukit		
	Sekapan and Punan Bah [Sub-Ethnic Group of Kajang]	Belaga District	Nicolaisen (1986)
	Lahanan [Sub-ethnic Group of Kajang]	Located Upriver from the Bakun Rapids in middle Balui, Belaga District, in Sarawak's Seventh Division	Alexander (1990)
	Kayan	Middle Baram, Upper Rejang, Lower Tubau	Uyo (1989)
	Kayan and Lahanan	Bakun Rapids in Belaga	Guerreiro (1988)
	Bisaya	Limbang River in Limbang District	Punchak (1989)
	Kejaman	Rejang River in Belaga	Strickland (1986)
	Kelabit	Inhabit the high intermontane valleys deep inside the navigable rivers of the Baram and Limbang Districts in the interior of Northern Sarawak	Saging and Bulan (1989)
	Lun Bawang	Limbang	Datan (1989)
	Punan Bah	Long Bah, Rejang River	Nicolaisen (1983)
	Penan	Long Jek Along Seping River in Belaga	Brosius (1986)

Edible Forest Products: Wildlife (Collected/Hunted from the Wild or Grown in Secondary Forests)	All Native Groups (Wild Pig/Wild Boar/Bearded Pig [75 percent], <i>Pelandok</i> , <i>Kijang</i> , <i>Rusa</i> , Macaque, Civet, Squirrel, Porcupine, Langur, Monitor Lizard, Phyton, Bear, Pangolin, Pheasant, Small Cats, Eagle, Gibbon, and Hornbill)	Baram, Belaga, Julau, Kapit, Lawas, Limbang, and Song Districts	Caldecott (1986)
	Iban (Wild Pig, <i>Rusa</i> , <i>Kijang</i> , Frog, Other Animals, Fish)	Mukah and Anap Region in the Sibu Division	ITTO (1995)
	Iban and Bidayuh (Fishing and Game)	Lundu District	ITTO (1990)
	Iban (Fishing and Game)	Kapit Division	ITTO (1990)
	Iban (Not Specified)	Batang Kemena and Batang Tatau in the Bintulu Division	Taylor, Hortin, Parnwell, and Marsden (1994)
	Iban (Wild Pig, <i>Rusa</i> , <i>Kijang</i> , <i>Pelanduk</i> , Monkey, Gibbon, Pig-tailed Macaque, Porcupine, Crocodile, Bear, Squirrel, Tortoise, Pigeon, Black Hornbill, Argus Pheasant, Fish, Prawn, Turtle,)	Bintulu Division	Parnwell and Taylor (1996)
	Iban (Fish)	Rejang Valley (Second Division)	Sutlive (1992)
	Bidayuh (Flying Fox, Small Deer, and Phyton, Fish, Insects)	Teng Bukap (Kuching)	Burgers (1993)
	Kenyah (Fish, Wild Pig, Deer, Barking Deer, Mousedeer, Monitor Lizard, Monkey, Squirrel, Civet, Scaly Anteater, Hornbill, Porcupine, Bearcat, Sun Bear)	Long Selatong Ulu in Baram	Chin (1985)
	Kajang (Fish and Game)	Belaga District	Luhath (1989)
	Sekapan (Fish and Game)	Belaga District	Nicolaisen (1986)
	Lahanan (Wild Pig, Deer,	Belaga District	Alexander (1990)

	<p>Monkey, Bear and Fish)</p> <p>Kayan and Lahanan (Wild Pig, Deer, Fish)</p> <p>Bisaya (Wild Boar, Barking Deer, Deer, and Mousedeer)</p> <p>Kejaman (Fish, Turtle, Shrimp, Shellfish, Pig, Deer, Snake, Monkey, Birds Etc.)</p> <p>Lun Bawang (Wild Meat and Fish)</p> <p>Punan Bah (Wild Pig, Monkey, Lizard, Varanas, Porcupine, Squirrel, Turtle, Water Snail, and Shrimp)</p> <p>Penan (Wild Pig)</p> <p>Penan (Wild Pig)</p>	<p>Bakun Rapids in Belaga</p> <p>Limbang River in Limbang District</p> <p>Rejang River in Belaga</p> <p>Limbang</p> <p>Long Bah, Rejang River</p> <p>Seventh Division</p> <p>Baram, Bintulu, Miri, Limbang, Belaga</p>	<p>Guerreiro (1988)</p> <p>Punchak (1989)</p> <p>Strickland (1986)</p> <p>Datan (1989)</p> <p>Nicolaisen (1983)</p> <p>Brosius (1986)</p> <p>Langub (1989)</p>
Edible Forest Products: Vegetable Matter and Fruit	<p>Iban (Vegetables including <i>miding</i>, <i>paku</i>, and <i>tubu</i>; edible fungi including <i>daun sabung</i> and <i>kepayang</i>, <i>tubu</i>)</p> <p>Iban (Fruit)</p> <p>Iban (Fruit)</p> <p>Iban (Fruit and Vegetables)</p> <p>Iban (Edible Ferns, Bamboo Shoots, Cabbages of Several Palms Including Sago, Jackfruit, Rambutan, Durian, Lensat, Bananas, Plantains, Mango, Mangosteen, Papaya, Guava, Malay Apple, Water Apple, Oranges, Pomelo, Starfruit, and Soursop)</p> <p>Bidayuh (Ferns, Sago,</p>	<p>Mukah-Anap Region in the Sibu Division</p> <p>Batang Kemena and Batang Tatau in Bintulu</p> <p>Bintulu Division</p> <p>Pantu Sub-District of Sri Aman</p> <p>Rejang Valley (Second Division)</p> <p>Teng Bukap (Kuching)</p>	<p>ITTO (1995)</p> <p>Taylor, Hortin, Parnwell, and Marsden (1994)</p> <p>Parnwell and Taylor (1996)</p> <p>Pearce, Aman, and Jok (1987)</p> <p>Sutlive (1992)</p> <p>Eurgers (1993)</p>

Fungi, Wild Fruit Bamboo)		
Kenyah (Mustard Green; Mushroom and Other Fungi; Ferns; Tapioca Leaves; Heart of Bananas, Bamboo, Ginger, and Palms; Sago; and Fruit)	Long Selatong Ulu in Baram	Chin (1985)
Kajang (Sago, Bamboo and Banana)	Belaga District	Luhat (1989)
Kayan and Lahanan (Fruit and Vegetables)	Bakun Rapids in Belaga	Guerreiro (1988)
Bisaya (Durian, Breadfruit, Langsat, Mangosteen, Starfruit, Rambutan, Jackfruit, Mushrooms, Ferns, Bamboo Shoots)	Limbang River in the Limbang District	Punchak (1989)
Kejaman (Fruit and Vegetables)	Rejang River in Belaga	Strickland (1986)
Punan Bah (Sago; Ferns, Bamboo Shoots, Bananas, Shoots from Certain Rattans, Mushrooms, Berries, Durian, Breadfruit, Mangosteen, Rambutan, Langsat, Coconut Palm, Areca Palm, and Papaya)	Long Bah, Rejang River	Nicolaisen (1983)
Predominantly Orang Ulu but includes Iban (21 Species of Fruit, 15 Species of Vegetables Grown in Secondary Forests and Sold in Markets)	Miri District	WWF (1994)
Penan (Sago)	Long Jek Along Seping River in Belaga	Brosius (1986)
Penan (Sago, Edible Palm Leaf Buds, Other Vegetables, Fruit)	Baram, Bintulu, Miri, Limbang, Belaga	Langub (1989)
Native Communal Needs (predominantly Orang Ulu but including Penan and Iban.)	Baram and Limbang Districts	SAM (1990)

	Native Groups - Orang Ulu, Iban, and Penan (Wildlife including aquatic, Sago, Vegetables and Fruit)	Baram and Belaga Districts	Hong (1987)
	Sarawak Forest Department (Nipah Sugar, Bird's Nest)	Sarawak in General	Annual Report of the Forest Department Sarawak (Various Years)
<i>Non-Edible Forest Products (Timber For Manufacturing Boats, Construction of Houses, Manufacturing Agricultural, Transport (Oars), and Other Decorative Implements; Rattan for Manufacturing Mats, Baskets, Agricultural Implements and furniture; Firewood, Illipe Nut, Medicines)</i>	Iban (Medicines; timber for longhouses, boats, and fuels; rattan for making mats, baskets, and handicrafts)	Mukah-Anap Region in the Sibu Division	ITTO (1995)
	Iban (Timber; Rattans; Firewood; Fibres from Grasses, Lianas, and Palms; <i>Illipe Nut</i>)	Batang Kemena and Batang Tatau in Bintulu	Taylor, Hortin, Parnwell, and Marsden (1994)
	Iban (Timber for housebuilding, boatbuilding, agricultural implements; Rattan species for mats and baskets, ha's, fish traps, animal cages; Bamboo; Medicines for fever, relieving snakebites, drunkenness, soap)	Bintulu Division	Parnwell and Taylor (1996)
	Iban (60 Plant Species Used in the Manufacture of Handicrafts, 46 Species (Timber) for the Construction of Housing, Agricultural Implements, 40 Species for Medicines, Poisons, and Toiletries)	Pantu Sub-District of Sri Aman	Pearce, Aman, and Jok (1987)
	Iban (Rattans and <i>Illipe Nut</i>)	Rejang Valley (Second Division)	Sutlive (1992)
	Bidayuh (Timber, Rattan, Bamboo, Insects, Hardwood Posts for Peppervines)	Teng Bukap (Kuching)	Burgers (1993)
	Kenyah (Timber, Boats; Rattan; Garu; <i>Illipe Nut</i> ; Antlers of the Barking Deer and Sambar Deer; Bezoar Stones from the Grey Leaf Monkey; Hornbill Ivory from the	Long Selatong Ulu in Baram	Chin (1985)

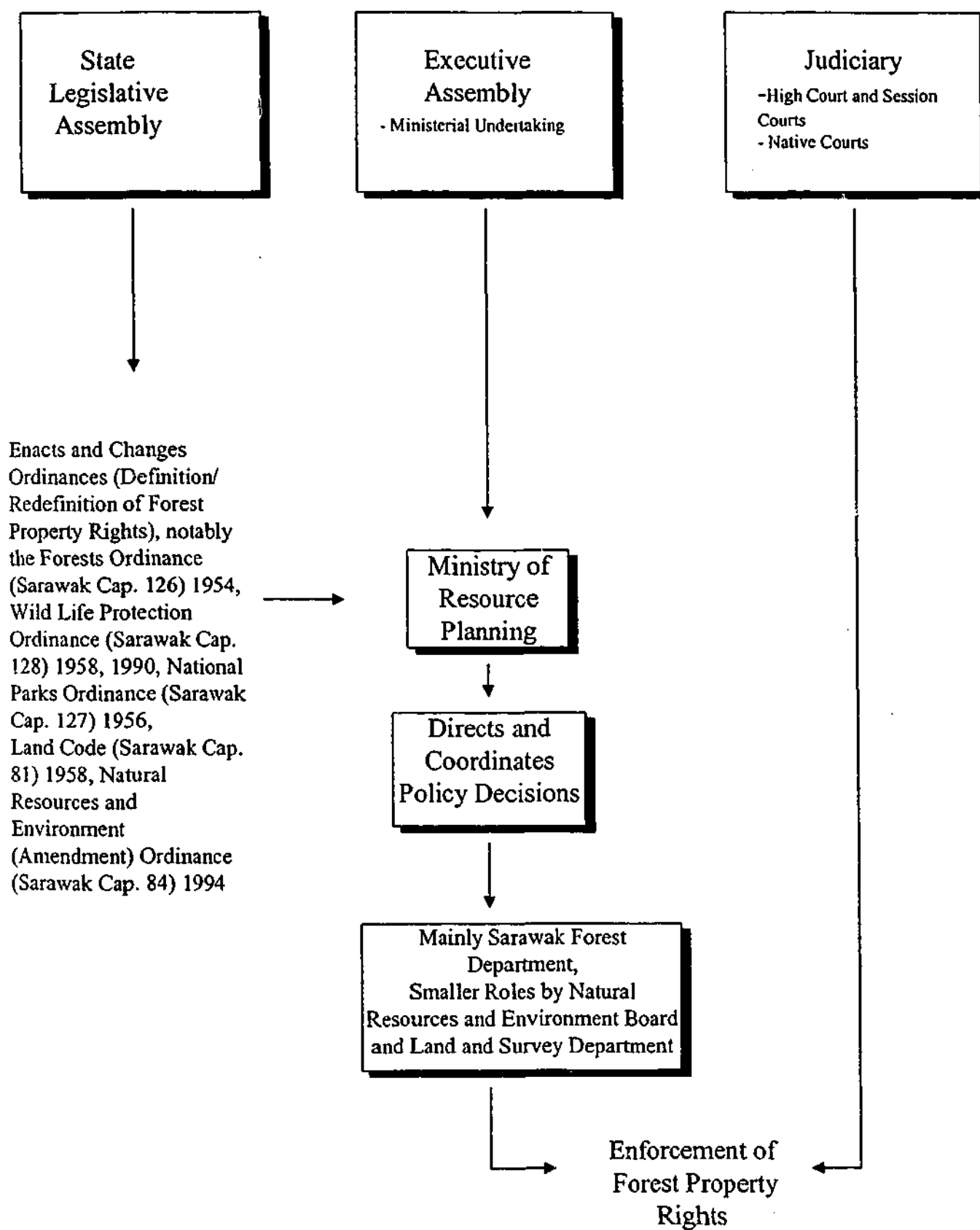
Casque of the Helmeted Hornbill; Claws, Canines, and Gall Bladders of the Sun Bear, Damar and Resins from Trees, and Scales of the Anteater)		
Iban (Timber, Rattan)	Kapit Division	TTO (1990)
Iban (Timber)	Limbang and Lawas Districts	ITTO (1990)
Bidayuh and Iban (Rattan)	Lundu District	ITTO (1990)
Sekapan and Punan Bah (Timber, Rattan, and <i>Illipe Nut</i>)	Belaga District	Nicolaisen (1986)
Kelabit (Timber)	Limbang District	ITTO (1990)
Lahanan (Rattan)	Belaga District	Alexander (1990)
Kayan (Timber, Rattan)	Middle Baram, Upper Rejang, Lower Tubau	Uyo (1989)
Kayan and Lahanan (Timber, Bamboo, Leaves)	Bakun Rapids in Belaga	Guerreiro (1989)
Kejaman (Timber, Firewood, <i>Illipe Nut</i> , and Gravel Collecting)	Rejang River in Belaga	Strickland (1986)
Lun Bawang (Rattans, Damar)	Limbang	Datan (1989)
Kadayan (53 Species Were Used for Medicines)	Sibuti Sub-District in the Fourth Division and the Lawas/Limbang Sub-District in the Fifth Division	Ahmad (1993)
Punan Bah (Timber, Rattan)	Rejang River (between Kapit and Belaga), Kakus River and Kemena River (Fourth Division)	Nicolaisen (1983)
Penan (Rattan, Camphor, Jelutong, Damar, Bezoar Stones)	Long Jek Along Seping River in Belaga	Brosius (1986)
Penan (Timber, Rattan, Camphor, Jelutong [Wild Rubber], Poisons, Damar, Bezoar Stones,	Baram, Bintulu, Miri, Limbang, and Belaga	Langub (1989)

	Medicines)		
	Penan and Kelabit (Timber, Poisons)	Limbang District	ITTO (1990)
	Native Communal Needs (predominantly Orang Ulu but including Penan and Iban)	Baram and Limbang Districts	SAM (1990)
	Native Groups - Orang Ulu, Iban, and Penan (Timber, Engkabang, Medicines)	Baram and Belaga Districts	Hong (1987)
	Sarawak Forest Department (Export of <i>Illipe Nut</i> , Firewood, Charcoal, Guano, Rattan, Damar, Gaharu Chips, and Bee's Wax)	Sarawak in General	Annual Report of the Forest Department Sarawak (Various Years)
<i>Human Abode and Native Graveyards</i>	All Native Groups (Human Abode)	Sarawak in General	Hong (1987)
	Native Community Leaders (Graveyards)	Kapit District	ITTO (1990)
	Native Community Leaders and General Public (Graveyards)	Long Jegan (Tinjar River)	ITTO (1990)
	Penan (Graveyards)	Limbang District	ITTO (1990)
	Penan (Human Abode)	Baram and Limbang Districts	SAM (1990)
	Penan (Graveyards)	Long Palo, Long Jenalong, Long Keyok, and Long Leng	Cleary and Eaton (1992)
<i>Biodiversity: Plant and Animal Species</i>	WWF (Plant - Timber and Vegetation - and Animal Species)	Sarawak in General	WWF (1985)
	WWF (Rainforest Diversity)	Sarawak in General	Kavanagh, Rahim and Hails (1989)
	WWF (Animal Species)	Districts of Baram, Belaga, Julau, Kapit, Lawas, Limbang, and Song.	Caldecott (1986, 1992)
	WWF (Swamps and Proboscis Monkey)	Sarawak Forest Mangrove Reserves in Kuching	Bennett (1989)
	WWF (Plant Species - mangroves, riverine,	Samunsam Wildlife Sanctuary in Kuching	Rajaratnam (1992)

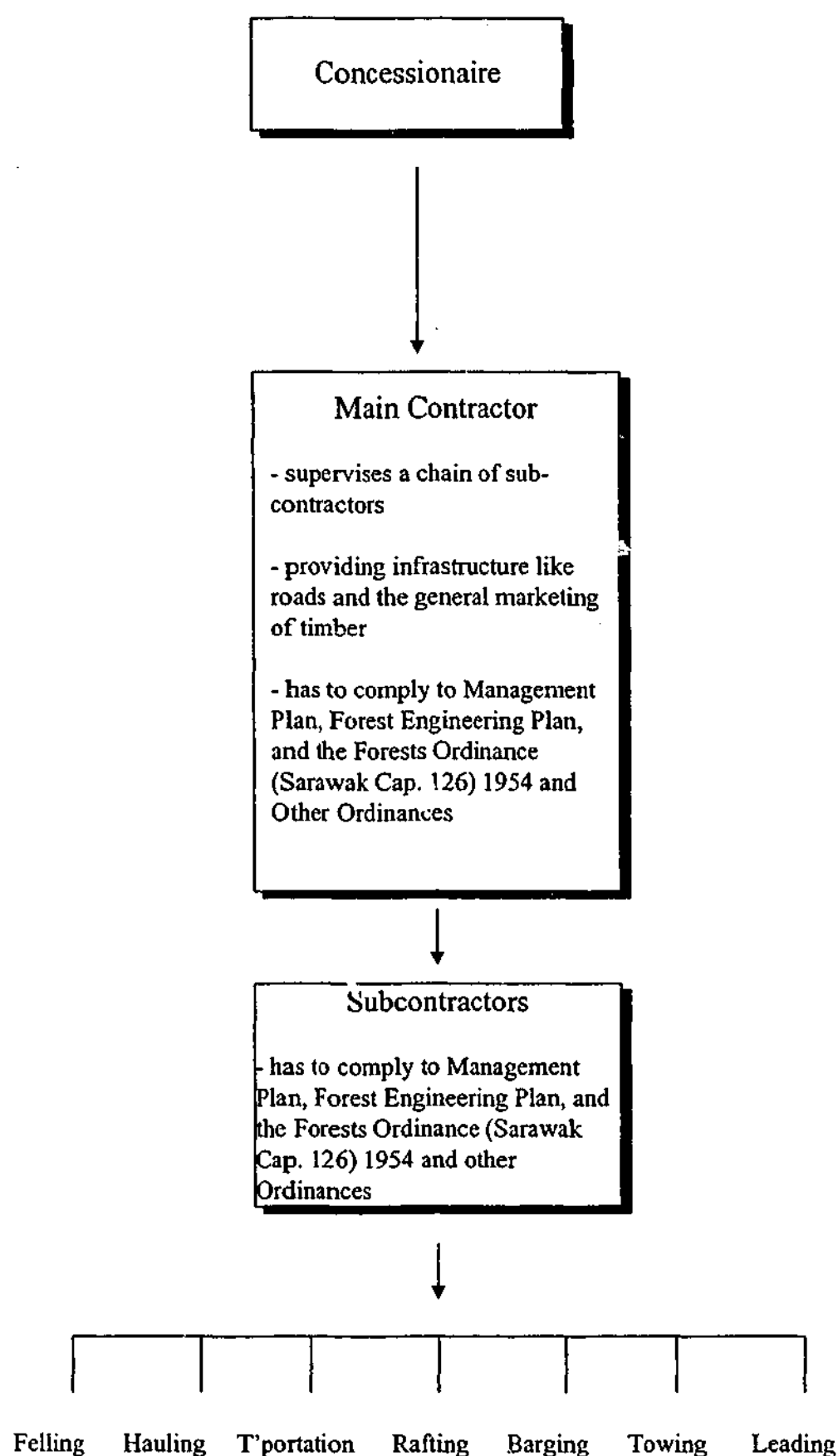
	tropical heath, and mixed dipterocarp forests; Animal Species - proboscis monkey, banded langur, silvered langur, long tailed macaque and Bornean Gibbon)		
	WWF (213 Indigenous Palm Species: Rattans, Sago, Cabbages, and Fruit)	Sarawak in General	Pearce (1990)
	Sarawak Forest Department (National Parks and Wildlife Office)	National Parks and Wildlife Sanctuaries	Aken (1982); Morshidi (1982); Morshidi and Gumal (1995); Ngui in Kiew (1992)
<i>Soil Erosion (Water Pollution) and Water Catchment</i>	Iban (Water Quality)	Bintulu Division	Parnwell and Taylor (1996)
	Iban, Kadayan, Penan (Water Supplies)	Limbang District	ITTO (1990)
	Iban (Water Pollution)	Bakong (Marudi)	ITTO (1990)
	Native Community Leaders (Soil Erosion and Silt)	Lundu District	ITTO (1990)
	Native Community Leader and General Public (Water Pollution)	Long Jegan (Tinjar River)	ITTO (1990)
	Native Community Leaders and General Public (Water Pollution, Landslides)	Baram River	ITTO (1990)
	Native Community Leaders (River Bank Erosion, and Siltation)	Belaga in Kapit District	ITTO (1990)
	Penan (Water Pollution)	Long Napir in Limbang District	ITTO (1990)
	Penan (Water Pollution)	Bario in Marudi	ITTO (1990)
	Lun Bawang (Water Catchment Supplies)	Limbang District	ITTO (1990)
	Native Groups - Orang Ulu, Iban, and Penan (Water Pollution, Floods, Siltation of Rivers, Turbidity)	Baram and Belaga Rivers	Hong (1987)

	WWF (Water Supplies, Siltation of Rivers and Turbidity, Water Catchment)	Belaga, Tutoh, and Tinjar Areas	WWF (1985); Kavanagh, Rahim, and Hails (1989).
	ITTO (Water Pollution and Soil Erosion, Water Catchment)	Throughout Sarawak (Sibu, Bintulu, Lundu, Baram, Limbang, Marudi, Miri)	ITTO (1990)
<i>Recreation and Tourism</i>	ITTO (Recreation and Tourism)	National Parks and Wildlife Sanctuaries throughout Sarawak	ITTO (1990)
	Sarawak Forest Department (Recreation and Tourism)	National Parks and Wildlife Sanctuaries throughout Sarawak	Annual Reports of the Forest Department (various years); Bujang and Sandi (1992); Forestry in Sarawak Malaysia (1991); Ngui in Kiew (1992)

Appendix 4.1: Definition and Enforcement of Forest Property Rights in Sarawak



Appendix 4.2 Structure of the Timber Industry



Appendix 4.3

Selective Felling System which includes the Forest Engineering Plans

The General Harvesting Plan (GP) details the coupe layout, road network of the entire licensed area, the locality of campsites, dumping points, and access roads on a 1:50,000 scale map sheets. Coupes are numbered in the order that they will be harvested. The GP serves as a basis for detailed planning of individual coupes, and has to be submitted to the Section Forest Office for approval before the commencement of more detailed planning.

Activities	Timing
Stage 1: Application for Permit-to-Enter Coupe is submitted to the Forest Department.	Any time
Stage 2: After the GP has been approved, the logging operator then commences with the detailed planning of the individual coupes using large scale topographic maps of scale 1:10,000 or larger. This is known as the Detailed Harvesting Plan (DP) which contains information pertaining to the Forest Engineering Plan. The DP details the logging road network comprising main, secondary and feeder roads based on specifications and designs provided by the Forest Department (roads are to be located in a manner which follows the topography, minimises the risk of earth materials entering streams and rivers, avoids crossing of streams, and shared with existing concessionaires whenever possible. Road designs are also clearly specified in terms of gradients, widths, drainage systems (side drains and culverts to minimise ponding and erosion), surfacing materials, and measures to reduce erosion on exposed surfaces. All logging blocks are to be served by roads, whenever possible, so as to keep the maximum skidding distance within 1 km.	0-6 th Month
Stage 3: The DP has to be submitted to the Forest Department 16 months before the commencement of felling operations.	8 th Month
Stage 4: After approval of the DP by the Forest Department, the logging operator commences with the actual demarcation and survey of coupe boundaries (boundary marking), alignment and survey of proposed roads on the ground, preparation of surveyed road alignments on topographic workmap of scale 1:10,000, preparation of profile drawings for main and secondary road alignments together with design of finished formation level.	10 th Month
Stage 5: Two copies of the topographic workmap showing details of Stage 4 is then submitted to the Forest Department.	12 th Month
Stage 6: The plans are checked and officers of the Forest Department carry out field check of the DP if necessary.	14 th Month
Stage 7: After the plan and profile drawings have been approved by the Forest Department, the logging operator then commences with road construction, demarcation of block boundaries and 10% tree enumeration of all logging blocks ending usually in the twenty second month taking a period of around 10 months.	22 nd Month
Stage 8: The operator then begins felling operations on the twenty fourth month. In practice, however, such detailed planning and enforcement does not happen and logging is carried out haphazardly. This has been substantiated in Arentz (1996), Bevis (1995), and Taylor, et. al. (1994), and also through personal observation while travelling through forested areas and rivers in Sarawak.	24 th Month

Source: Chua (1996) and *Guidelines for Preliminary Environmental Impact Assessment (EIA) for Forest Harvesting*. Sarawak, Malaysia: Natural Resources and Environment Board, 27 January 1995.

Appendix 5.1: Percentage of Field Staff by Function in Each Section

Function/Section	Admin.	Engineering	Boundary Constitution, Silviculture and Mgt., Logging Control	Revenue	Protection and Prevention
Kuching	10	-	66	8	16
Sibu	10	2	72	2	14
Bintulu	5	2	75	6	12
Miri	6	2	78	4	10
Mean	8	1	73	5	13

Source: ITTO (1994c), p. 15.

Appendix 5.2: Costs and Benefits of Enhancing Social Coordination

Coordination Activity	Forest Functions Covered	Costs Per Ha/Total Costs (RM/US\$) [US\$ 1 = RM 2.5]*
General Survey (Identification/Constitution) - ground survey of all Sarawak's forested areas (remaining sixty percent of unsurveyed land). - identification of native rights in forests (shifting cultivation areas, native abodes and graveyards) - demarcation of forested areas for its various functions (PFEs, Native Customary Areas, National Parks and Wild Life Sanctuaries for the preservation of biodiversity and recreation and tourism, and water catchment areas)	<ul style="list-style-type: none"> Commercial Timber (6.0 million ha), Shifting Cultivation and Agriculture (3.8 million ha including communal areas containing edible and non-edible products, abodes and graveyards), Human Abode and Native Graveyards Biodiversity (1 million ha), Soil Erosion and Water Catchment, Recreation and Tourism. <p>Currently nearly 5 million ha have been surveyed. Remaining areas of 7.5 million ha that is still unsurveyed, of which 1.5 million ha are in steep terrains.</p>	<p>RM 25/ha in easy terrains and RM 45/ha in steep terrains (slopes exceeding 35 degrees)</p> <p>Total Costs for 7.5 million ha (sixty percent of unsurveyed land): RM 217.5 million (A) or RM 21.75 million or US\$ 8.7 million for the next 10 years (RM 29/hectare or US\$ 11.6 per hectare) (A)</p>
Inventories (Measurement) - measurement of timber content - edible and non-edible forest products (identification and measurement) - native abodes and graveyards - biodiversity (identification and measurement)	<ul style="list-style-type: none"> Commercial Timber, Edible and Non-Edible Forest Products protected in legislation, and Native Abodes and Graveyards in the current 4.4 million ha of PFEs (Total Proposed Area: 6.0 million ha) Biodiversity: Currently 288,806 ha of TPAs. (Total Proposed Area: 1.03 million ha) consisting of national parks and wildlife sanctuaries. 	<p>RM 6.55 per ha for general inventories.</p> <p>Total Costs for 6.0 million ha (undertaking a complete survey to identify timber, edible and non-edible forest functions, and native abodes and graveyards: RM 39.30 million or US\$ 15.72 million (B)</p> <p>RM 7.03 per ha for biodiversity inventories.</p> <p>Total Costs for 1.03 million ha:</p>

(maintaining boundaries cont'd)		Total Costs for 4,100 km: RM 4 million per year or US\$ 1.6 million (H)
<p>Supervision (Preventing and Penalising) - Assuming 400,000 ha logged per year. - Additional 255 field staff to supervise logging operations [at least two inspections per week for hill forests of moderate terrain (<60 degrees) and daily inspections of hill forests of steep terrain (>60 degrees)] to the current 50 field staff supervising operations.</p> <p>Staff to supervise National Parks and Wild Life Sanctuaries on a continuous basis as per Mannan and Awang (1992)</p> <p>Alternatively, monitoring of National Parks and Wild Life Sanctuaries on a Twice Weekly basis</p>	<ul style="list-style-type: none"> • Commercial Timber, • Native Shifting Cultivation and Agriculture, • Edible and Non-edible Forest Products • Human Abode and Graveyards • Soil Erosion and Water Catchment 	<p>Supervision: RM 1,000 (12 months) × Number of Staff</p> <p>Total Costs of Supervision: 400,000 ha: RM 4.58 million or US\$ 1.83 million (I)</p> <p>Biodiversity (Continuous Monitoring):</p> <p>RM 135 per ha</p> <p>Total Costs for 1.03 million ha: RM 139.05 million or US\$ 55.62 million (J)</p> <p>Biodiversity (Twice Weekly Checks)</p> <p>RM 12.23 per ha</p> <p>Total Costs for 1.03 million ha: RM 12.6 million or US\$ 5.04 million (K)</p>

Notes for the various scenarios below:

1990 Total Recurrent Departmental Expenditure of the Sarawak Forest Department for defining and enforcing forest property rights: RM 22.92 million (US\$ 9.17 million) (Items 1 and 2 of the Annual Recurrent Expenditure Items). Revenue for 1990: RM 734 million (US\$ 293.6 million).

Scenarios 1 and 2 reflect the extent of logging in Sarawak (400,000 ha per year).

Scenario 1:

SECTION 1.1

First Year

Conditions:

400,000 ha of PFEs are supervised,
Daily Monitoring for TPAs

Total Costs = $A/10+B+C+D+E+F+G+H+I+J$

Total Costs of Social Coordination: RM 216.64 million (US\$ 86.66 million)

(inclusive of an extraordinary once for all expenditure on inventories of RM 46.5 million denoted by B and C, and spreading the total ground survey costs over ten years)

⇒ 8.82 times the 1990 Total Recurrent Departmental Expenditure by the Sarawak Forest Department for the first year.

SECTION 1.2

Second Year to Tenth Year

Total Costs = $A/10+D+E+F+G+H+I+J$

Total Costs of Social Coordination: RM 170.10 million (US\$ 68.04 million) per year (years 2 to 10)

(excludes cost of inventory [B and C] which is completed by the first year)

⇒ 6.79 times the 1990 Total Recurrent Departmental Expenditure by the Sarawak Forest Department from the second to tenth year.

SECTION 1.3

Eleventh Year to Twenty Fifth Year

Total Costs = $D+E+F+G+H+I+J$

Total Costs of Social Coordination: RM 14.99 million (US\$ 6.00 million) per year (years 11 to 25)
(excludes costs of ground surveying [A/10] which is completed by the tenth year)

Scenario 2:

SECTION 2.1

First Year

Conditions:

400,000 of PFEs are supervised
Twice Weekly Monitoring for TPAs

Total Costs = A/10+B+C+D+E+F+G+H+I+K

Total Costs of Social Coordination: RM 90.21 million (US\$ 36.08 million)

(inclusive of an extraordinary once for all expenditure on inventories of RM 46.5 million denoted by C and D, and spreading the total survey costs over ten years)

⇒ 3.93 times the 1990 Total Recurrent Departmental Expenditure by the Sarawak Forest Department for the first year.

SECTION 2.2

Second Year to Tenth Year:

Total Costs = A/10+D+E+F+G+H+I+K

Total Costs of Social Coordination: RM 43.7 million (US\$ 17.48 million) per year

(excludes cost of inventory [B and C] which is completed by the first year)

⇒ 1.9 times the 1990 Total Recurrent Departmental Expenditure by the Sarawak Forest Department from the second to tenth year.

SECTION 2.3

Eleventh Year to Twenty Fifth Year

Total Costs = D+E+F+G+H+I+K

Total Costs of Social Coordination: RM 2.34 million (US\$ 0.94 million) per year (years 11 to 25)

(excludes costs of ground surveying [A/10] which is completed by the tenth year)

Benefits of Social Coordination

Average Benefits Per Ha

Timber	:	RM 21,000 per harvest
Shifting Cultivation	:	RM 1,121 per year
Edible and Non-edible		
Forest Products	:	RM 10,177 per year
Biodiversity	:	RM 492 per year
Water	:	RM 275.3 per year

Timber Profits:

Average Benefits Per Hectare: RM 21,000 per harvest (US\$ 8,400)

Timber Revenues (Royalties and Permits):

Average Benefits Per Hectare: RM 2,000 per year (US\$ 800)

Non-Timber Benefits:

Average Benefits Per Hectare: RM 12,065 per year (US\$ 4,826)

Costs of Social Coordination

Average Costs Per Ha (Total Costs of Social Coordination/7.0 million ha)

Scenario 1

First Year	:	RM 28 per ha
Second to Tenth Year	:	RM 22 per ha

Scenario 2

First Year	:	RM 13 per ha
Second to Tenth Year	:	RM 6.2 per ha

* Costs are based on 1990 prices and exchange rates reflecting the value of the Ringgit prior to the financial crisis, which is relevant to this study which covers the period from the 1980s to 1995. The exchange rate since 1998 has been around US\$ 1 = RM 3.8.

Sources: Estimates and calculations based on *Economic Case for Natural Forest Management: Main Report*. Japan and Malaysia: ITTO and FRIM, December 1994a; *Economic Case for Natural Forest Management: Country Reports*. PCV (VI)/13 Volume II. Japan and Malaysia: ITTO and FRIM, October 1994b; International Tropical Timber Organization (ITTO). *Pre-project Report: Manpower Development of Sarawak Forest Sector*. Ref No.: PCI(VII)/7. Prepared by the Forest Department, State Government of Sarawak, Malaysia, 1994c; Mannan, Sam, and Yahya Awang, "Development and Forest Management: An Assessment Based on Field Experiences", Proceedings of the 11th Malaysian Forestry Conference, Kota Kinabalu, Sabah, 27 July - 2 August 1992; "The Dwindling Forest Beyond Long San", *The Economist* 316, No. 7668 (18 August 1990); Wan Yusoff Wan Ahmad, "Satellite Imagery for Forest Resources Monitoring

and Management in Peninsular Malaysia", Paper Presented at the Persidangan Perhutanan Malaysia Kesepuluh (Tenth Malaysian Forestry Conference), Kuantan, Pahang, 24-29 Julai 1989.

Appendix 6.1: Estimate of Areas Logged in Sarawak**

Year	Production of Timber (m ³)	Estimate of Areas Logged (ha)*	Average of Areas Logged (Per 5 Years)
1961	1,350,239	30,005	}
1962	1,402,157	31,159	}
1963	1,704,000	37,867	}38,411
1964	1,841,000	40,911	}
1965	2,345,230	52,116	}
1966	3,005,494	66,789	}
1967	3,648,163	81,070	}
1968	4,229,501	93,989	}88,898
1969	4,285,032	95,222	}
1970	4,834,075	107,423	}
1971	4,431,366	98,474	}
1972	3,434,079	76,312	}
1973	3,470,386	77,120	}76,210
1974	3,056,700	67,927	}
1975	2,754,707	61,216	}
1976	4,670,430	103,787	}
1977	5,072,365	112,719	}
1978	6,133,509	136,300	}154,624
1979	7,653,080	170,068	}
1980	11,261,265	250,250	}
1981	8,965,108	199,224	}
1982	11,484,671	255,215	}
1983	10,767,246	239,272	}245,718
1984	11,590,820	257,574	}
1985	12,478,757	277,306	}
1986	11,656,030	259,022	}
1987	13,802,401	306,720	}
1988	14,502,259	322,272	}342,967
1989	18,283,243	406,294	}
1990	18,932,794	420,528	}
1991	19,485,911	433,020	}
1992	18,891,854	419,819	}
1993	16,773,897	372,753	}389,162
1994	16,337,715	362,622	}
1995	16,105,914	357,598	}

** Modified and adapted from Hong (1987) and updated to 1995. All data obtained from Annual Report of the Forest Department, various years (Appendix F), except 1963 and 1964 from Hong (1987) and 1994 and 1995 from Sarawak Forest Department's Web Page (<http://www.forest.gov.my/p85.html>)

* Assuming an estimated yield of 45 m³ per ha.

Source: Hong (1987); Annual Report of the Forest Department, 1961-1992; and Internet

Appendix 6.2

Forest Concessions Belonging to Tan Sri Taib Mahmud's Group (Present Chief Minister) and Tun Rahman Yakub's Group (Previous Chief Minister) as Per the Political Revelations in 1987

Present Chief Minister's Group

Company:	Size of Concession:
Septex Plantation Sdn Bhd	30,000 ha
Bumi Hijau Berkembang Sdn Bhd	26,000 ha
Sarimas Sdn Bhd	32,000 ha
Sarako Sdn Bhd	36,000 ha
CDC Joint Venture LCDA	50,000 ha
Gerogo Quarry Sdn Bhd	not stated

Previous Chief Minister's Group

Company:	Size of Concession:
Baltim Timber Sdn Bhd	48,763 ha
Syarikat Delapan Sdn Bhd	67,476 ha
Lembah Mewah Sdn Bhd	94,126 ha
Kehutanan Sentiasa Sdn Bhd	30,829 ha
Berbet Sdn Bhd	35,554 ha
Maguari Sdn Bhd	33,554 ha
Keruntum Sdn Bhd	198,926 ha
Shobra Sdn Bhd	1,163 ha
Mosko Lumber Sdn Bhd	69,786 ha
Sarawtab Sdn Bhd	104,842 ha
Kabala Sdn Bhd	1,425 ha
Sebiyau Logging Sdn Bhd	17,549 ha

Source: Jawan (1994) and Yu (1987)

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