

WORKING PAPER 2002-4

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Co-Management of Forest Resources in Canada: An Economically Optimal Institutional Arrangement

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Co-Management of Forest Resources in Canada:

An Economically Optimal Institutional Arrangement

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Co-Management of Forest Resources in Canada: An Economically Optimal Institutional Arrangement

Abstract: Co-management, referring to sharing power and responsibility between the governments and local resource users, is usually justified from political and legal perspectives. However, it is also justified by economic efficiency perspective. Property right and transaction cost are used in this paper to demonstrate the option of co-management as a case of Pareto-improvement. Non-pricing of many attributes of forests, high transaction costs associated with delineation of attributes-specific property boundaries to different stakeholders, specialization of different stakeholders in required factors, and user-specific values of different attributes of forests contribute to co-management being an economically optimal option. In Canada, since the early 1970s, the dynamics of values of different forest attributes called for different property right arrangements: one for increased property rights of Aboriginal people, and another for better defined public rights for environmental and ecological values. These two trends led the emergence and development of co-management.

Key words: Aboriginal people, co-management, modern land claim agreements, natural resources, property rights, and transaction cost.

1. Introduction

Co-management is a recurrent form of growing importance in management of natural resources. Broadly speaking, resource management situation characterized by the presence of two or more than two parties, which share inputs (factors) and/or outputs and decision-making, is called co-management. These parties can be the community of local resource users, government, external agents (NGOs, academic and research institutions, industry), and other resource stakeholders; and the parties share rights and duties, and power and responsibility for the management of a resource. However, a narrow but dominant version of co-management only refers to “the sharing between governments and local resource users” (Berkes et al. 1991). Partnership arrangements, degrees of power sharing, and integration of local (informal, traditional, customary) and centralized government systems vary across co-management cases.

Co-management is closely allied with collaborative management, participatory management, community management, joint management, and stakeholder management. But co-management is usually considered different from community-based resource management, in which a government or a third party from

outside the community usually plays a minor role. Community-based co-management is the most typical co-management since co-management is often related to public and communal resources, community and economic development, capacity building, and institutional support. Generally, co-management is a route to community-based development (Pinkerton, 1989).

Government serves a number of important functions in co-management. Based on the level of participation and involvement of government, co-management has been classified as in Figure 1. Co-management is a middle course between the state-control and local-level control for self-governance, self-regulation and active participation. Based on the nature of managed resources, co-management can be divided into two kinds. The first kind is species or resource specific management. Government involvement attempts to avoid “tragedy of the commons” of the resource and helps the local people to govern and manage the resource effectively and in a sustainable way. The co-management in fishery largely belongs to this kind. The second kind is areas-specific, generally with interest of multiple resources. General public, represented by the government, and local users have significant conflicts in the use of these resources. For instance, forest resources not only provide the economic goods for the local people but also provide some environmental goods for the general public. In such cases, the local people and the general public hold diverse preferences for different goods in the area, and mutually agreeable tradeoffs are necessary for successful resource management. The co-management in forestry and wildlife resources largely belongs to this kind.

[Figure 1. Spectrum of co-management (Sen and Nielsen 1996)]

Comparatively, co-management is extensively practiced, but still lacks theory (Beckley 1998), specifically economic theory¹. Co-management is generally understood either as a conflict resolution system or a system of empowerment of local people (decentralized system) from political and legal perspectives. Economic rationale for such a management system has not been fully realized. In fact, neo-liberal economists will argue against such system. Neo-liberal economics is based on the Walrasian model, in which market adjustments are frictionless, so the costlessly determined prices alone always suffice for all allocation problems, and institutions are superfluous. Indeed, the Walrasian model may

¹ Property rights and transaction costs have been used extensively to explain common property resource management (Ostrom 1990, Swaney 1990, Bromley 1992, Thomson and Wilson 1994, Abdullah et al. 1998, Judge 2002) and sharecropping in agriculture (Cheung 1967, Bardhan and Srinivasan 1971). But, there is no serious attempt to address co-management of forest resources, the multiple attributes of forest resources, and associated property rights and transaction cost issues.

explain many problems in capitalist economies, where prices play a vital role. But, for non-market economies, where prices are eschewed, suppressed, or non-existent, the Walrasian model is inadequate, and the property rights approach attains the utmost importance in the analysis of decisions about resource allocation (Barzel 1989, p.99).

In the case of natural resources, specifically forest resources, many attributes, such as many non-timber products and services, are not priced, and transactions are costly; absence of prices and costly transactions require non-price allocation methods, and corresponding institutions and organizations. Co-management is a non-price allocation method, an institutional arrangement, aimed at social welfare maximization, specifically through minimization of transaction costs. Hence, it may be a pareto-efficient or at least pareto-improvement over previously existing management systems. Therefore, it is not only a political and legal solution, but also an economic solution of resource management problems. However, to understand economic rationale behind it, we have to use property right approach and not the Walrasian model.

With this motivation, we first propose economic theory of forest co-management based on property rights and transactions costs. Second, evolution of forest property rights in Canada is examined, and emergence and development of forest co-management is explained. Finally, we provide some thoughts of co-management with a wider range of property regimes and policy implications for designing economically optimal property regimes.

2. Economic Theory of Forest Co-Management

Property rights² of individuals or groups over an asset consist of the rights to draw benefits, to exclude others from benefits, to manage the asset, and to involve in productive activities associated with the asset. Management rights include rights for providing or sharing inputs, rights to decide the management or production process, rights to organize the management or production process, and rights to intermediate and final outputs. The dominant economic theory of property rights is the theory developed by Demsetz (1967), and supported by historical evidence provided by North and Thomas (1973), De Alessi (1980), and Posner (1980), etc. This theory says the bundles of private property rights increase with the economic

² Generally economists, such as Bromley 1991 and Hirsch 1999, have followed Hohfeldian conception of property rights, according to which “if one person holds a “right” to some thing, at least one other person must have a corresponding duty not to interfere with his/her possession and use” (Cole and Grossman 2002). We follow the same definition of property rights.

scarcity of the property, and has argued for private property rights. Some economists³ have justified the public property rights for natural resources due to multiple functions of these resources that conflict with the single product objective that provide profits to most private owners (Luckert, 1992; Bockstael and McConnell, 1993). However, these arguments have missed two points. First, there are more than two systems of property rights (private and public property rights), and one of them is joint or co-property rights (or co-management). Second, Demsetz's theory assumes the property to be as a single attribute object. But, every property or asset has multiple attributes (Barzel 1989), and these attributes may be totally different in their physical and economic features. For example, the different attributes of forests are timber, non-timber physical products, environmental and ecological services, recreational services, and aboriginal services. Some of these attributes have characteristics of a private good, such as timber and some non-timber physical products; some of a public good such as environmental and ecological services; and some are common-pool goods with difficult exclusion but with high subtractability, such as fruits, berries and leaves. Normally, forest attributes of private good nature are traded in the market and priced, but attributes with features of public goods and common pools goods are normally not traded in the market, and are not priced.

However, absence of pricing does not mean the attributes are not valuable, but absence of pricing definitely means that the Walrasian model is not the correct choice to explain resource allocation in the case of forest resource management. The different attributes of forest may have different economic values for different groups such as forest industries, Aboriginal people, local forest-dependent groups, environmental groups, and other members of society. Because of different economic values for different groups, any pattern of property rights inclined towards the single right-holder or ownership to all attributes of forest will increase externalities, and may not yield the maximization of social welfare. Since, the different attributes of forests have different economic values for different groups, one group may not have all the physical factors necessary for the management (production process) of resource, and the single right-holder may have to acquire these inputs from outside sources. But, the different groups, who have the joint property rights on different attributes, may be able to contribute to social welfare by pooling their factors together. In the case of single ownership or right holder, the focus of right holder will be on a single or few attributes, which are valuable to the right holder, and other attributes will be in the public domain resulting into open access problem. Hence, an economically efficient structure of rights should be designed to allocate property rights of all attributes among parties in such a way that the parties who have a comparative advantage in managing the attributes that are susceptible to the open-access

³ Other economists, such as Baland and Platteau (1998) and Libecap (1989), have raised the issues of distribution, social capital, and the role of state in evolution of property regimes.

problem will obtain rights over them. Similarly, joint allocation of property rights will also help in capturing the gains due to specialization of different groups in the management of different attributes. Co-management seems an attempt in that direction, whether a particular co-management arrangement is Pareto-improvement or not will depend upon actual property right structure used in the specific co-management arrangements and the pre-existing property rights.

An individual's or group's rights over an asset or some attributes of an asset are not static, and are function of their own, community's, and government's protection efforts and attempts of other people or group to capture them. The efforts of other people or group to capture them will depend upon the value of the asset or the attributes to those people. The value of an asset or some attributes to a group/individual is not the same over a time, and may vary with socio-economic, market, political, and environmental factors. For example, about thirty years back, environmental and ecological services of forests were not treated as too much valuable. But, now due to environmental awareness and environmental movements all over the world, these attributes have become highly valuable, if not to the whole society, at least to environmentally aware groups and people. Similarly, even though Aboriginal values were always valuable to Aboriginal people, but society as a whole did not put much importance in recognizing the values of Aboriginal People. But, now society as a whole has recognized Aboriginal values. Hence, the efforts of non-right holder groups to capture rights to the asset or at least some attributes of the asset will evolve with time. The main reason of emergence of co-management systems, in the recent past, is the increasing values of many attributes of forest which were not valuable before, and the attempts of these groups, such as environmental, Aboriginal, to capture the rights of the groups, such as forest industries and states, who previously hold the rights over some other forest attributes such as timber.

However, property rights are never absolute irrespective of the number of agents or groups to whom rights are assigned. Property rights can be changed by individual's, groups, or governments actions. The greater is others' potential to affect the flow of returns from someone's asset without bearing the full costs of their actions, the lower is the value of the asset. Hence, it may seem that the nominal right holder of an asset or an attribute of the asset have the right to the income or return from the asset, but it is a right to gross income or return and not to the net income or return which the asset can generate. The net return will depend upon the cost of associated transactions, and the maximization of the net value of an asset, then, involves that property right arrangement that minimizes the transaction costs, and most effectively constrains uncompensated resource use. Transaction costs are the costs associated with transactions at different stages of forest resource management and use. In the case of forest resources, three important stages are the delineation of property and property rights, accessing inputs (factors) in the management of

forest resources, and claim to outputs. Next, we demonstrate that how the case of co-management may be a case of transaction cost minimization in all the three stages.

Transaction Cost of delineating property and property rights

In general, the delineation of the boundary of the property rights on natural resources is too difficult. The nature of nature is often unique, less standardized. Both the quality and quantity are costly to measure. Specifically, forest resources are not a mix of few separable commodities or physical products (such as timber and non-timber products) but it is a system that is also valuable for its functional contributions. Regulation, production, carrier, and information are some functions of forest ecosystems. These functional contributions of forests are derived by keeping its different components working in their existing functional relationship as a fully functionalized system, and not separately from disjointed discrete units of the system. It is true that for some user groups, such as industrial units, only some physical products such as timber are valuable, but for other user groups, such as environmental groups, Aboriginal groups, and society at large, these functional attributes are also valuable. The functional attributes have features of public goods, and cannot be demarcated like private goods. That means the division of “the bundle of property rights” is much more difficult and costly in these cases. These functional attributes are also subject to variability and lack of full information which further enhances the difficulty to delineate separable property rights (Barzel, 1989). Co-management of forest resources is essentially a compromised solution that reflects the problem of delineation, and it minimizes transaction cost of delineation.

The costs are not only concerned in delineating (*ex ante* of transaction costs), but also implementing and protecting the property rights (*ex post* of transaction). Due to non-separable features of physical and functional attributes of forests, an independent allocation of property rights of different attributes to different user groups will lead to high-scale shirking in management efforts, conflicts in the management objectives and practices, and externalities in outcomes. In the case of allocation of the rights to all attributes to one group, control of access and exclusion of other groups must be costly or nearly impossible. If the state directly manages the resources, it is impractical in communities where the local people are highly dependent on forest resources. Similarly, it is almost impossible to exclude Aboriginal people from their traditional use of forest resources. Consequently, compliance with property rights held or allocated by the government to private industries units is very low and implementation cost will be very high. This is why the conventional approach of allocation of property rights over the forest resources

through legislation to one user group is not successful in many cases. In such cases, co-management is an attempt to minimize ex-post transaction costs.

Transaction Costs and Use of Factors in Forest Management

In the case of single property-right holder, factors not available with the right holder are bought through transactions in the market. Co-management from factors aspect is the pooling of factors by different partners, rather than transactions through the market. Since, different forest attributes have different values for different user-groups, these groups may acquire specialization in the factors with respect to management of user-group specific attributes. For example, Aboriginal people have specialization with respect to management of Aboriginal Values while industrial groups have specialization in the management of forest for industrial products. In the respective groups, the specialized factors will be available at low cost. Hence, the pooling of factors will minimize the cost of factors as well as the cost of transactions of the factors. For simplicity, we take the example of two partners – government and local people, and demonstrate the effect of factor transactions on the choice of property regime.

Figure 2 shows some representative cases of production using factors from government and local people. The slope of the tangent line to the iso-quant is the relative price of the factors, and the point of tangency indicates the optimum factor combination under given relative factor prices. As stated earlier, theoretically, single owner and management authority does not mean that multiple inputs cannot be secured. If the transaction costs of the input factors are free or low, it does not matter who manages the property in all three cases since either the government or the local people can purchase optimum inputs from other side under any given output level (Coase Theorem). The problem lies in costs, as we know the transaction costs are never free and low.

If transaction costs are high but per unit costs are same for the governmental factors to local people and the local factors to government, then in the case of Figure 2a, public management may be superior to the local-management since the majority of factors are from the government, and only small amount of factors is required from local people. In the case of Figure 2b, the local-management may be superior; and in the case of Figure 2c, the co-management may be superior. These cases can be observed in other industries too. Traditionally, it is capital that hires labor in most cases (Dow 1993). But in current IT industry, it is becoming more common that labor hires capital, or labor and capital join together, probably because the transaction costs of the skilled labor is more costly, while the transaction costs of capital

become cheaper thanks to the stock market, while the information on the labor is too uncertain at this time.

[Figure 2. Three Cases of Production Factors and Management Options.]

In the case of pooling of factors, coordinating efforts are not costless. One of the major costs is mutual monitoring. However, if such costs are less than the transaction cost of input factors through market, which can be understood as acquiring, contracting, monitoring costs of the efforts, then pooling is more efficient. Normally, coordination costs will decrease with increase in social capital (Baland and Platteau 1998). Efficiency may be increased especially when the unit cost of same input factors (labor, capital, information, technologies, land, etc.) greatly differ between the different partners in co-management such as local people and the government, but transaction is too costly through markets.

For instance, capital may be cheaper for the government, but labor may be cheaper for the local. So the government contributes capital, while the local people contribute labor. Both the local people and the state have their complementary strengths of their two systems and their advantages in capital, labor, and knowledge in the production process. Pooling rather than trading inputs reduces the incentive, but save some costs. Similarly, the relative role of the government and the local depend on 1) the isoquant curves; 2) the relative price of inputs, 3) the relative transaction costs of the inputs and the 4) the interaction of the two inputs. It is worth to point out that the case of Figure 2b is quite common in communal resource management. It means without the support and input of local people, the production cost will be extremely high. In summary, in the cases where multiple user-groups have high stakes on different attributes of forests, co-management may be an effort to minimize the total costs, including the cost of factors as well as cost of transactions, associated with all factors.

Transaction Costs and Sharing of the Outputs

From the perspective of outputs, co-management is a system of sharing the outputs. Normally, different user-groups have different and some time even conflicting preferences on the same resource. For instance, aboriginal people may value wildlife relatively more as hunting resources, while the non-aboriginal people or government may value wildlife more for option value or existing value. So the preference or trade-off between two products is different for the two user groups.

Figure 3 shows a typical two-product Production Possibility Frontier (PPF), and preferences of local people and government. Without considering trade between the local people and government, the point A will be chosen if under government management; and C will be chosen if under the management of local people. However, social optimum is at point B, and if transactions of output are free, either government or local people will be willing to operate at point B, which is better-off. The timber will be sold to the government if owned by the local, non-timber will be sold to the local if owned by government. The preferences shown in Figure 3 are just illustrative, and may not hold for all communities or local user groups. It is also possible that local community weight more on timber, and employment generation through timber harvesting and processing, in such cases, co-management, in which local communities are one partner, may not be much different than the management by forest industries.

[Figure 3. Production Possibility Frontier and Preferences of Different Groups]

However, the transaction costs are never zero, and in such a case a transaction between timber and non-timber may not lead to the socially optimal point of B. The location of the outcome of market transactions on the PPF will depend upon the relative transaction costs of trade of timber versus non-timber products. In the case of positive but not very high transaction costs, the government and local are likely to choose a point between A and B, and between B and C, respectively, along the PPF. An alternative to save the social losses from positive transaction costs of the outputs is to share the outputs. For instance, based on the agreement between the local people and the government, joint production at B may be chosen. With such combination, the timber (T^*) belongs to the government, and the non-timber (NT^*) goes to the local people.

Transaction costs are saved with such sharing of outputs. However, similar to sharing of the factors, sharing the outputs is also not costless. The costs include negotiations, contracting and implementing how to share the outputs. However, if the costs of sharing outputs are low compared to transaction costs of outputs, sharing, and hence co-management, will be economically optimal outcome. Specifically, when the demand and value of environmental services, ecological services, and Aboriginal Values from forests increases, trading of these services through market is either impossible or transactions costs are too high, so co-management of forests that reduces the trading by sharing outputs, will be an economically optimal forest management system.

Hence, co-management is an economic tool attempting to minimize transaction costs associated with all three stages of forest management, delineation of property rights, use of factors, and distribution of

outputs. Next, we examine the evolution of forest property rights in Canada; then naturally we explain how the co-management emerge and develop in Canada.

3. Evolution of Forest Property Rights in Canada

Like community-based management, co-management is much more common in developing countries than in developed countries. But Canada is an exception, largely because Canada is a natural resource based country. As argued above, generally, populations grow and economic development takes place, resources become scarcer, and property rights gradually becomes more specified. The pace of the process is largely dependent on the nature of different attributes of a resource, and the dynamics of value of these attributes. Evolution of property rights in Canadian forests follows this basic principle. Even though, most of the Canadian forests have been owned by the Crown⁴, since the beginning of European settlement, some deliberate changes have been taking place. To understand the co-management, we must know how the changes happen. Now let us briefly review such changes in Canadian forest property rights.

Absence of “Forest Property Rights”

“Living in harmony with Mother Earth” and “The Earth does not belong to man, man belongs to the Earth” (Chief Seattle, cited in Oakes et al., 1998) are commonly shared values of Aboriginal people through out the world. The main features of Aboriginal belief-system are Supremacy of nature, Non-ownership of scared land and natural resources, and Living for seven generations (or inter-generational equity).

Hence, during the pre-European era, the concepts of property rights and ownership were absent in the territory, which is now known as Canada. However, absence of property rights does not mean absence of institutions. Aboriginal people have well established system of governance, and institutions with respect to their use of natural resources such as fishing, hunting, and trapping (Dickason 1997). The belief and customs (e.g., man belongs to the Earth) are the informal institutions. Even though based on regular and annual practices, different First nations had their customary hunting and trapping areas, but there was no

⁴ In Canada, a small percentage of forest area (about 6%) is under private ownership, and it is unevenly distributed. We can see the trend that share of private ownership decreases from the East to the West and from the South to the North, corresponding to the Canada’s development history (see the data collected in Haley and Luckert 1990). Our discussion, in this paper, is limited to forest area under crown ownership.

concept of ownership. At this period of time, the value of forests was hardly reflected in the wood, but more as base of wildlife, the source of hunting.

European Intrusion, Value of Timber for Military Purposes, and Emergence of State Property Rights

European settlements began in the late fifteenth century. John Cabot landed in Newfoundland in 1487 and Jacques Cartier in Quebec in 1534 (both east coast), but it was more than a century later in 1647 that the first explorer, James Cook, landed at Nootka, on the west coast (Rawat 1985). The colonial power switched between France and Britain for about two centuries, depending upon whose troops had won the last round of battle on these lands.

During French period (prior to 1763), mainly Oak and pine timber were valued for military purpose, and the Government reserved all the rights to itself over these species of forest. Forest property rights in Quebec were most influenced and shaped by the French system⁵. But by 1763, at the end of the seven years war, the British conquest brought all Canadian colonies under the effective control of Great Britain. After the British victory in war in 1763, the first twenty years of the British rule made little impact either on land or on the forest due to the British recognition of the French system of land tenure (1771) and civil law (1774) (Lambert and Pross 1967, p. 16), but after the war of American independence, when the tide began to turn against Britain, land tenure system moved towards English Common Law (Pearse 1998)⁶.

⁵ Forest property rights in Quebec have their roots in French system. The aim of the French in colonizing was to reproduce, as far as possible, in the spirit and in form the political and social institutions of France. They faithfully copied the French feudal system that was characterized by a distinct class of Seigniors, who were the only class to hold their titles directly from the crown, and receiving their grants on the express condition of subdividing them among their tenants. Other conditions of land grants included rent payment, performance of number of duties and obligations, and numerous reservations and conditions affecting the land. In terms of forests, the main features of these land grants were (i) the government reservations of timber adapted for naval and military purposes, mainly Oak and some white pine timber; and (ii) customary, but not strictly legal, reservation by the Seigniors, of timber for various purposes out of the holdings leased to their habitants (Southworth and White 1957, p.154).

⁶The English system of freehold land tenure was introduced in the lands ceded by the Indians. In the beginning, harvesting rights were given only for giant Oak trees, for use as masts, spars and hulls in the British Navy, but during the Napoleonic wars (1763 and 1775), when Britain encouraged North American timber supplies through preferential trade regime (low tariffs), harvesting rights were extended for red and white pines. As per the Constitutional Act of 1791, all land in Upper Canada was to be granted in freehold; but one-seventh was set aside for the use of the Crown and one-seventh for the support of the Protestant, and the Crown also reserved for itself all timber, such as red and white pine, suitable for ship-building (Lambert and Pross 1967, p. 17). During the period of 1776 to 1826, harvesting rights were granted to a select number of royal contractors to supply timber to the Royal Dockyards, these contractors in turn transferred their rights to Canadian lumberman (Southworth and White 1957, p. 173).

In summary, up to 1826, forests were valued only for military purposes, and the Crown reserved all valuable species and trees, on crown land as well as private lands allotted under free-grants, for its own use, and only Crown contractors could had harvesting rights.

Commercial Value of Wood and Land, and Emerge of Partial Private Use Rights in the Crown Forests

In 1826, the British Parliament, through a proclamation, extended harvesting rights from the Crown land to anyone on a payment of certain fee, and the fee schedules included species other than oak, red pine, and white pine (Southworth and White 1957, p. 173). Hence, this was the first time that forest or timber was valued as a source of public revenue, and for a purpose other than military uses. All the regulations related to the harvesting rights to a common lumberman were given statutory shape by the first Crown timber Act, 1849. In 1851, value of timberland, in addition to value of timber, was recognized, and the Crown Timber Act was amended to include the payment of annual ground rent.

Thus by the time of confederation in 1867, when most of provinces were given exclusive ownership and authority over their public lands⁷, the two main features of forest property rights were a system of an annual license to cut Crown timber and a system of Crown charges based on land area and timber volume⁸. The Crown continued the reservation of timber for military purposes on lands allocated as free-

⁷ Three Prairie provinces were given control over their natural resources only in 1930 though they joined the confederation earlier (Manitoba in 1870, Alberta and Saskatchewan in 1905).

⁸ However, there were some variations across different provinces. For example, In British Columbia, granting of cutting rights by means of licenses had begun in 1865, but timber resources could be acquired by outright purchase of Crown land till 1896 (Lower 1938, p. 233). While the first Timber Lease did not bear a royalty, the Land Ordinance did allow that charges might eventually be imposed. This happed in 1984 (see Schwindt 1987, p.190). In Prince Edward Island, all crown land had been alienated in 1767 and conveyed to individuals in the hope of settling and developing the region (Munro 1855, p. 354). In Nova Scotia, there were no tenure regulations till the 1930's, and the only way to utilize the timber resources was by outright purchase of forest land (Lower 1938, p.xiv). In Newfoundland, the regulations for disposal of crown land began in 1871, but the terms were very generous and the duration of lease was 99 years (Gray 1981, p. 15). In Ontario and Quebec, after the introduction of timber licenses, for anyone, people engaged in lumbering operations speedily discovered that in many cases it was more profitable to buy wooded land than to pay even the moderate price charged for timber licenses. Hence, against the principle embodied in repeatedly issued instructions from the Home Department, much of the area covered by extensive grants was capable of producing nothing, but timber (Southworth and White 1957, p.181).

hold in Ontario and Quebec⁹. These features of property rights established at the time of confederation continued till the end of the nineteenth century.

Source of Industrial Development, and Emergence of Long-term Private Harvesting Rights

By the end of nineteenth century, it was recognized that timber has a great value as a source of industrial development. Technological developments specifically in the area of pulp and paper sector strengthened this view. The contribution of the forestry sector to the Canadian economy over last century has provided empirical evidence for this. Pulp and Paper technology also allowed the use of small diameter trees and other conifer species such as spruce.

Dependence of certain communities and townships on these large firms made the health of these companies equally important to the government. Hence, forest property rights were amended to accommodate the continuity of forest resource use, or availability of raw material to these industries in long-term. Large areas of crown forests were allocated to big lumber companies or pulp and paper companies. Initially, these allocations were for one year but could be renewed indefinitely, but later duration of harvesting rights was extended to twenty-one years. Even though, conservation movement had its peak period in early twentieth century, and many concerns were raised with respect to future state of the Canadian forests. But, there was no significant change in forest property rights with respect to these concerns, except inclusion of charges for fire protection and pest control in addition to charges for timber harvested and land rent¹⁰.

Inter-Generational Externalities of Forests, and Forest Property Rights Based on Sustained Yield

By the 1940s, heavy exploitation of timber resources, without any long-term considerations regarding future timber supplies or the stability of communities dependent upon timber utilization, made the government and industry think seriously about sustained yield policy (Wetton 1977). In British Columbia, the Royal Commission Report by Justice Sloan (1945) and in Ontario, the Royal Commission Report by Major-General Kennedy (1947) have shown their concern regarding lack of proper forest management,

⁹ The “Free Gants and Homestead Act of 1868” expressly reserved to the Crown all pine trees on land allotted under the act, with the customary exception of timber for building, fencing, and fuel and those trees necessarily removed in clearing the land (Southworth and White 1957, p. 256).

¹⁰ In Ontario, the Legislature passed Forest Fires and Prevention Act in 1917, and details of different programs and schemes for fire prevention are available in Lambert and Pross (1967).

and argued to manage forest resources so as to get a sustained timber supply in perpetuity. Based on these reports, timber acts were revised, and the property right systems were reshaped. The long-term (twenty-one years) harvesting right holders were allowed to cut timber volume less than allowable annual cut (AAC). This was against the previous system of no limit on harvestable volume. The revised acts also imposed penalties on operators using wasteful harvesting practices. Such constraints on current timber harvest rights are in fact to recognize partial property rights (or the externalities) for the future generation.

In the 1960s and 1970s, large share of forest areas, due to growing pressure from environmentalists and conservationists, was reserved as wilderness areas, which reduced the productive forest base. Moreover, a forest inventory indicated a potential timber supply shortage in future. This led to a new property right arrangement, known as Forest Management Agreements in Ontario, Forest License and Tree Farm License in British Columbia, and Timber Supply Agreements in Quebec, which included partial transfer of management responsibility to harvesting right holders (private companies). The onus of some forest management activities such as regeneration lies on the licensee, who is reimbursed the expenditure incurred on these activities. The overall management however rests with the province. The emergence of wood processing technology for Medium Density Fiberboard (MDF) and Oriented Strand Board (OSB) and establishment of MDF and OSB mills in 1980's extended the forest property right arrangements from softwood species to hardwood species, specifically Aspen.

Environmental Externalities in Forests, and Property Rights Based on Sustainable Forest Management

The environmental values of the forests are becoming more and more important in Canada in the past a few decades (Adamowicz and Veeman, 1998). Such paradigm changes call for redefinition of property rights in forests. In the 1980s and 1990s, the activism of environmental and other non-government groups has forced national governments, all over the world, to extend the boundaries of forest management beyond timber harvesting or timber yield regulations. That means the general public have some property rights in the externalities of forest. The World Commission on the Environment and Development, 1987, brought attention to the deteriorating health of forests and emphasized "sustainable development". In view of these developments, the concept of sustained yield has been replaced by the concept of sustainable forest management (SFM), and many international initiatives have marked the process of defining SFM, for example the Helsinki Process for European forests, the Montreal Process for non-European temperate and boreal forests, the International Tropical Timber Organisation (ITTO) process for tropical forests (Rametsteiner, 2000).

Prior to the Earth Summit (1992), the Canadian Council of Forest Ministers (CCFM) identified Criteria and Indicators for SFM, and the world leaders attending the Earth Summit (1992) acknowledged the ecological, social, cultural, spiritual, and Aboriginal values of forests, and viewed these benefits as fundamental to successful SFM. The basic elements of SFM are the maintenance and enhancement of forest ecosystems and their contribution to global ecological cycles; conservation of biodiversity, soil, and water resources; multiple benefits from forests; and participatory forest management (CCFM, 1995). In the past ten years, Canadian provinces have amended their forest property right arrangements to ensure that forests are managed more holistically, in a way that recognizes CCFM Criteria and Indicators, and reflects Canadians' diverse forest goals (CFS 2002, p. 32). In addition, these revised property rights arrangements, such as Ontario's Forest Sustainability Act and British Columbia's Forest Practices Code, have also transferred most of the management responsibilities to the license holders.

4. Emergence and Development of Co-Management of Forests

Along with recognition of environmental and ecological values, Aboriginal values and Aboriginal rights came to forefront in the 1970s. Forests are critical for life-style of Aboriginal people, but till seventies the different governments of Canada did not recognize the rights of Aboriginal people or the social and economic importance of Aboriginal forest values, probably because the interest of Aboriginal people were still not too much threatened by the exploration of the wood values from non-aboriginal people. As the forests shrinking and the marginal values become bigger to the Aboriginal people, so the demand for their rights, and the old treaties (According to the Canadian government, 67 historic Indian treaties were known to have been made between the Crown and the Indian people of Canada) need to be assessed again (Nichols and Rakai 2001, Ross and Smith 2002). The conflicts between the local and the general public lead to emergence of the co-management.

The Supreme Court of Canada, in a case (*Calder et al. v. Attorney General of British Columbia*) of the conflict of resource use between the Aboriginal people and government of British Columbia, recognized the Aboriginal claims on natural resources, including forests, in 1973. The decision was followed by many other similar decisions in the Canadian courts, and these decisions resulted into Comprehensive Claim Agreements (CCA), which are also known as Modern Land Claim Agreements (MLCAs) or modern treaties, which signal the era of co-management on natural resources including forest resources. The first MLCA in Canada was the 1975 James Bay and Northern Quebec Agreement, and several MLCAs have been signed since then. For instance, the Western Arctic Innuvialuit Final Agreement in

1984, Gwich'in Land Claim Agreement in 1992, the Sahtu Dene and Metis Land Claim Agreement in 1993, and Tungavic Federation of Nunavut Final Agreement in 1993 (Saku 2001).

MLCAs, from political and legal perspective, are the official acknowledgment of the legitimacy of Aboriginal rights to the land. From social perspective, MLCAs promote local control of human and natural resources, participation of Aboriginal people in the decision making, and use of their knowledge (Saku 2001). In most of the MLCAs, there are provisions for monetary compensations to Aboriginal people, and therefore, some people may argue that these are economic tools for wealth transfer from non-Aboriginal people to Aboriginal people. But, these in fact are intended to be social welfare maximizing economic tools by minimizing transaction costs, all three types, discussed in Section 2. For example, participation of Aboriginal people in decision making and incorporation of Aboriginal knowledge on forest management reduces the transaction cost of forest management operations. Sharing of inputs, technological and capital inputs by governments and labor and local information inputs by Aboriginal people, reduces the cost of transactions of factors. In terms of output, MLCAs marginalize the interests of government or industry in natural, including forest, resources, and move the operations towards socially optimum point (a movement from point A towards point B in Figure 3).

The decade of the 1990s has been historic from the perspective of Aboriginal rights on natural resources. Many decisions in the Canadian courts such as *Sparrow* (1990), *Delgamuukw* (1997), *Halfway River First Nation* (1997), *Haida* (1997), and *Paul* (1998), directed the governments to recognize and protect Aboriginal rights and values. As mentioned earlier, sustainable forest management emerged in nineties, and many international and national, government and non-government initiatives such a Rio Earth Summit, Montreal Process, National Forest Strategy of Canada, CCFM Criteria and Indicators of SFM resulted in the recognition of increasing valuation of Aboriginal rights and values. These increasing values of many forest attributes led to many other types of forest co-management agreements in addition to MLCAs. These agreements are either between provincial governments and Aboriginal people or between industries and Aboriginal people.

The agreements, quite matching the spectrum of Figure 1, range from instructive to collaborative (joint) partnerships. Examples of different categories are: instructive - forest licenses for Aboriginal firms (Tanizul Timber Lit. of Tl'azt'en Nation in the Fort James region of B.C.); consultative - (e.g., Alberta Pacific Forest Industries Inc., Ontario's Timber Management Native Consultation Program); and joint stewardship (e.g., Mathias Colomb First Nation-Manitoba Moose and Caribou Co-management Agreement, Whitefish Lake First Nation and the Province of Alberta Agreement, Xax'Lip First Nation-

British Columbia Joint Stewardship Agreement), and industry-First Nation joint partnership (Mistik in New Brunswick, and Domtar Inc. in Quebec).

In these co-management agreements, specific rights and duties have been assigned to different partners. For example, in the case of Mistik agreement in Saskatchewan, three partners are Mistik Management Ltd. (formed by NorSask and Millar Western pulp mill in 1990), local communities, including more than 20 communities, mostly consisting of the aboriginal people (first nation and Metis), and the provincial government. Since, it is expected that the values and vision of the local community differs significantly from the government and industry, local management boards are formed to make the management more responsive to the values of local people. But at the same time, a regional board, consisting of outfitters, Metis groups, first nations, trappers, commercial wild rice producers, tourism and environmental groups, and representatives of the oil and gas industry, is a part of agreement to handle issues that transcended the boundaries or concerns of local management boards (Berckley and Korber 1996). In economic terms, joint-stewardships and joint partnerships agreements aim to minimize all three types of transaction costs discussed earlier while instructive or consultative agreements are aimed to address transaction costs associated with inputs or information only.

5. Conclusions and Policy Implications

The process of evolution of forest property rights, in Canada, towards co-management is quite illustrating. The Crown, over a period of about four centuries (from late sixteenth to twentieth century), opted to keep forest resources in public ownership, and allocate rather only partial property rights to private companies/firms over the attributes which have private property features. The process of private rights allocation has been gradual, and the new attributes, with private good characteristics, were included in the process as they became valuable either due to new technology or due to scarcity of some attributes. For example, many attributes with private good features, tree species, were kept in public regime or open access regime for long-time. But, once those attributes (species) became valuable due to technological developments, they were included into the bundle of private property rights. The Crown opted for co-management property regimes only when some attributes with public good and common good characteristics, such as environmental values and Aboriginal values, became valuable. These outcomes lead to numerous policy implications.

First, co-management is only one type and probably one phase of the property right in the evolution. For example, if most or all the valuable attributes of a resource are of private good nature, private property rights will emerge, or if in the beginning only those attributes that have private good features become

valuable, private property regime will emerge, at least with respect to those attributes. But if later, other attributes, which have public good features and common-pool goods features, become valuable, public property regimes, common property regime, and co-management regimes will emerge.

Second, co-management is not only a political and legal solution, but also an economic solution, and it is not only concerned with equity but with efficiency also. It is a social welfare maximization property regime for the situations which involves multiple attributes, with different characteristics – private, public, and common pool goods, of a resource, multiple stakeholders, and diversity in values of different attributes to different stakeholders.

Third, any property regime, including co-management, will not be efficient in all situations. The efficiency of a property regime will depend upon transformation costs as well as transaction costs. However, the optimality of a property regime is not a static outcome, and optimal property regime will evolve along the changes in relative values of different attributes of a resource, changes in relative preferences of different stakeholders for different attributes, as well as changes in population, local economy, and some other factors (Kant, 2000; Zhang 2001a).

Fourth, change in relative values of different attributes does not necessarily mean change in relative market prices, because some attributes may not be in market transaction at all due to their public or common good features. Hence, the change in relative value will mean the relative importance assigned to different attributes by the concerned stakeholder group, and these changes in relative values may be due to market forces as well as other factors such as environmental and social awareness, court decisions, and international conventions or agreements.

Fifth, increase in value (scarcity) of a given attribute will not always mean increase in private property rights, but it will mean increase in specification and clarification of property rights for that attribute (Zhang 2001b; Kant and Berry 2001). Hence, with increased scarcity, dynamics of property regimes may be in any direction i.e., from state property regime to private property regime or from private property regime to state regime or co-management regime. In the case of Canadian forests, in 1990s, forest property regime dynamics has been from some sort of private regime to co-management regime. A co-management regime between state and private firms emerged due to increased values of ecological and environmental attributes, and a co-management regime between Aboriginal people, state, and private firms emerged due to increased values of Aboriginal rights and values.

Sixth, sociologists have argued that trust is a key factor for successful co-management (Beckley and Korber 1996). Since, many stakeholders with different valuation and preferences for different attributes are involved in co-management, effective communication among different groups is essential to understand each other perspectives. Similarly, different partners may have their own strengths and weaknesses in terms of administration, technology, and financial resources, and all these resources have to be shared. Finally decisions, implementation, and monitoring responsibility should be shared and respected. Existing of trust may lead to reduction of transaction costs associated with all these events – communication, information, sharing of inputs, decision making, implementation, and monitoring. Some other conditions for co-management includes that the opportunity costs of absence of co-management should be high. Comparatively, in the presence of larger difference in the preference between the groups and larger transaction costs of inputs and outputs, and more even division of the valuable attributes, more gain shall be achieved from co-management

Seventh, property right arrangements (institutions) are not just the rules of the game, but also the processes of rules formation and implementation are critical for economic efficiency of any property regime. Institutional inertia and organizational inertia may either totally block new property regime, or may convert an optimal property regime into economically inefficient regime (Kant and Berry 2002). Therefore, a key objective in creating co-management property regime is to establish a framework within which diverse values and preferences of different groups may be addressed in a fair, consistent, and amicable manner. Specificities about rights and duties of members of different groups with respect to different attributes of the resource, specific sharing mechanisms for inputs as well as outputs, specifications of management units, specifications about conflict resolution mechanisms and the role of external agents, and the balanced structure of organization etc are some essential elements which will contribute to economic efficiency of co-management regimes, and should be addressed seriously.

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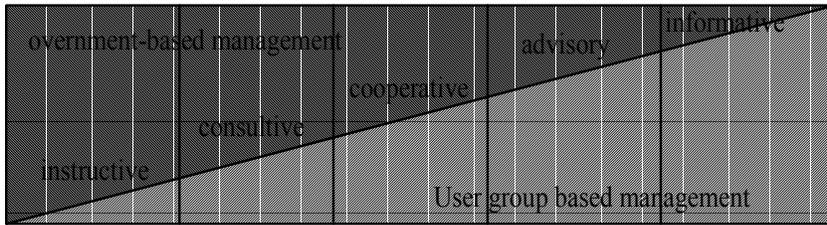


Figure 1. Spectrum of co-management (Sen and Nielsen 1996)

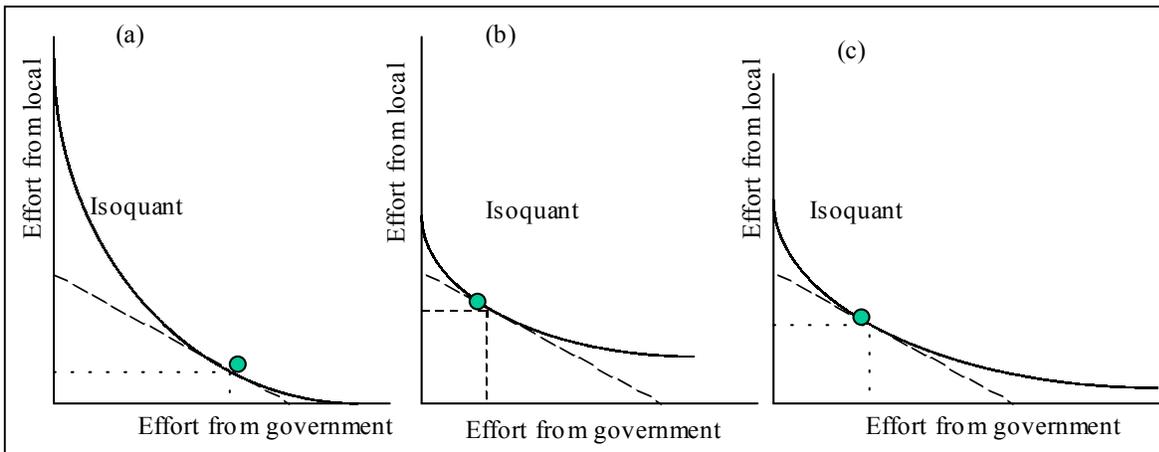


Figure 2. Three Cases of Production Factors and Management Options.

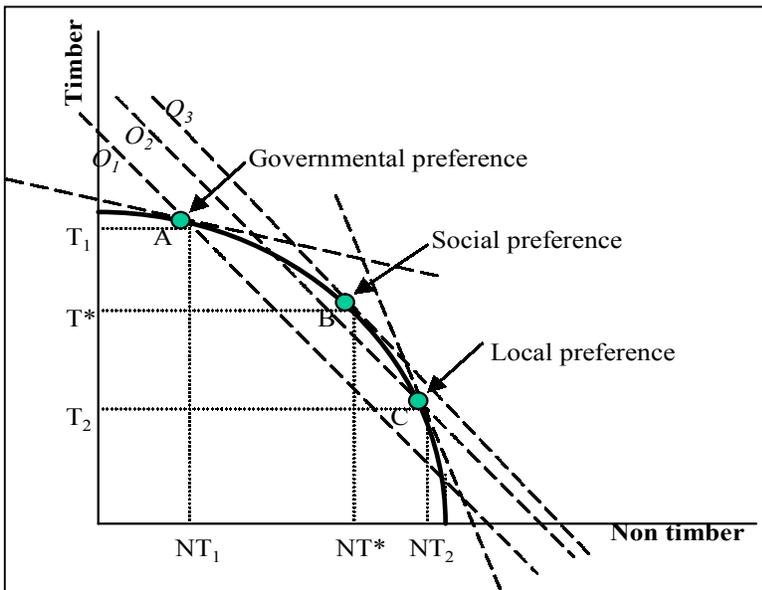


Figure 3. Production Possibility Frontier and Preferences of Different Groups