

**History of Forest Tenure Arrangements in Northern Ontario:
An Economic Interpretation**

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Introduction

This technical note reviews the history of forest tenure arrangements in Ontario in light of the economic theory of property rights. This theory anticipates that the manner in which access to forest lands is regulated through tenure arrangements has a significant impact on the way in which the resources on those lands are managed. The dominant institutional arrangement used to regulate access to forest lands in Canada has been state ownership of the resource endowment and private ownership of the enterprises that have used those resources. Access has typically been granted in the form of temporary permits and licences. Pearse (1988) has argued that although the structure of natural resource tenure arrangements has evolved over time in response to changing social conditions, nevertheless, the existing regime based on tenures is "unbalanced, resulting in costly waste and inefficiency in some cases."

The Economic Theory of Ownership

Economists often evaluate ownership or tenure arrangements based on three criteria: definition, defendability, and divestability. Definition refers to the clarity with which the identities of owners and things owned are enumerated. Ambiguities about either the identity of the owner or the extent of ownership can lead to conflicting expectations and actions. Defendability refers to the

effectiveness with which owners can exercise their ownership claims and the degree to which they can effectively exclude others. Divestability refers to whether owners can divest themselves of their ownership claims in voluntary exchanges with other owners. According to the theory, structures of ownership that clearly define owners and the relevant dimensions of things owned, that are effective in protecting the rights of action claimed by owners, and that facilitate the voluntary exchange of ownership claims perform better than those that do not.

Property rights play an important role in social coordination. Demsetz (1967) states that a property right holder "possesses the consent of his fellowmen to allow him to act in particular ways", and that "property rights convey the right to benefit or harm oneself or others". For example, harming a competing shopkeeper by offering better prices and reducing his sales may be permitted, while physically harming him may not (Demsetz 1967). Property rights thus define the acceptable limits of an owner's control over property.

Demsetz's (1967) theory of the structure of ownership has been widely used to study property rights in natural resources.³ This theory is dynamic and evolutionary. Initially, total demand for the resource is not sufficient to create scarcity. The case of two

³ For example, see Pearse 1988, Libecap 1990, and Fox 1994.

mutually exclusive uses of a hypothetical resource is illustrated in Figure 1. The total amount of the resource is indicated by the horizontal axis. The value of the resource for each of the two uses is indicated by the downward sloping marginal valuation schedules it is assumed that the marginal value will fall as the amount of the resource required for each use increases users are expected to satisfy their most urgent demands first. The marginal valuation for a given use is measured on the left vertical axis, and increasing resource consumption for this use is measured from left to right. The marginal valuation for the second use is measured on the right vertical axis, and increasing resource consumption for this use is measured from right to left. Before a resource becomes scarce it is typically subject to an open-access⁴ structure of ownership. Open-access means that no one has the power to exclude others from using the resource. Under these conditions, the resource is used on a first-come first-served basis until the marginal value of each resource use is zero.⁵ In Figure 1 this occurs before all of the resource is used. There is no scarcity in this scenario, because both of the competing uses of the resource can be satisfied to the point of zero marginal valuation without

⁴ Some early writers have referred to this situation as "common property." More recent literature has reserved this term to describe the situation where ownership is vested in some group in which membership is voluntary.

⁵ Or until the costs of access, say in the form of transportation to the resource or in the form of extraction costs, equals the marginal value.

one use interfering with the other.

Figure 1. Resource use in the absence of scarcity.

Over time, as demand increases with population density or an improvement in the standard of living, or as new uses for a resource are discovered, interference among uses can arise. This situation is illustrated in Figure 2. Now the marginal valuation functions have shifted, so that total demand for the use of this resource exceeds availability if both uses proceed to the point of zero marginal valuation. One scenario would be when the first use makes the resource unsuitable for the second use, and demand for the first use is realised first. Under an open-access ownership structure, the resource will be used by the first use until the point of zero marginal valuation is reached. This is indicated as point A in the figure. The remaining amount of the resource is available for the second use. The marginal valuation of the second use is indicated by the height of the marginal valuation schedule above point A in the diagram. This marginal valuation is substantially higher than that realized for the last unit devoted to the first use, which by construction is zero. But under open-access conditions no one has the power to exclude others. Therefore, mutually beneficial exchanges among resource owners are not possible. Users interested in the second demand cannot enter into enforceable agreements with users engaged in the first use of

the resource, because no one has the power to exclude.

Figure 2. Resource use conflicts with scarcity.

Under open-access conditions, there is no mechanism through which differences in individual valuations can influence the allocation of a scarce resource among competing uses. Higher valued uses that arrive too late in the decision-making process can be underrepresented. According to the economic theory of property rights, this underrepresentation of higher-value-uses creates a demand for institutional change. It creates an incentive to change the structure of ownership to more efficiently allocate the power to exclude. This type of change is not without cost, and may meet with political resistance from groups satisfied with the status quo. As the difference in marginal valuations among competing uses increases, however, so does the demand for institutional change. In figure 3, the shaded area indicates the size of the gains that could be obtained if marginal valuations could be equated across competing uses. These latent gains are the impetus for changing the property rights structure.

Figure 3. Potential efficiency gains from institutional change.

The alternatives to open access are state ownership, common

property ownership, and private ownership.⁶ Under state ownership, the power to exclude is vested in the political process. Common property denotes a situation where the power to exclude is vested in a group in which membership is voluntary.⁷ Several property is used to describe the situation where the power to exclude is vested in individuals. The relative performance of each of these ownership structures, in terms of their ability to coordinate human action in a manner consistent with appropriate stewardship of natural resources, continues to be debated in the literature. A conjecture that often appears in the literature⁸ is that the greater the extent to which the power to exclude is vested in individuals, the higher is the likelihood that patterns of resource use will correspond to variations in values. Exclusive rights allow owners to enjoy the full range of benefits of property. Owners with exclusive rights have the incentive to take into account all of the expected results of their actions (Mises 1966).

The notion of stewardship of a resource used here derives from a correspondence between prices and value. Values bracket prices

⁶ The latter category, following Hayek, is henceforth called "several property," indicating that ownership is dispersed among "the several," where the power to exclude is vested in a large number of individual owners.

⁷ This category includes a wide range of situations of ownership by families, clubs, corporations, and associations.

⁸ See Demsetz (1967), Pearse (1988), Barnett (1992), and Fox (1994).

(Mises 1966). For an exchange to take place, sellers must value what is received more than what is given up. For an exchange to be beneficial, buyers must place a higher value on what is received than what is given up. Stewardship refers to peoples' willingness to take care of a resource. Stewardship is defined here as the correspondence between conservation effort and value. Prices tend to guide conservation efforts and investments. Where prices indicate value, they guide conservation efforts and provide an incentive for stewardship. Where prices are not indicative of value or do not exist, valuation information is impaired, and incentives for stewardship are lacking. In some cases prices are not indicative of value. For example, there is no price for spotted owls in the Pacific Northwestern United States. Individuals, however, do value spotted owls. There is thus no market-based mechanism to guide the conservation of spotted owl habitat, and stewardship of the resource has suffered.

A Brief History of Forest Tenures in Ontario⁹

The Crown has owned most of the forests in northwestern Ontario since the early 1800s (Nautiyal 1977). A variety of institutional arrangements have been used to allocate timber from the Crown to the private sector for harvest. The property rights transferred through forest tenures have historically produced incentives that

⁹ This discussion is based on Lambert (1967)

can be anticipated from the discussion in the previous section.

Preconfederation

The earliest attempts at managing Ontario's forests was made by the French and later the English navies (Nautiyal 1977). In 1763 the Governor of Quebec was instructed by the English navy that all white pine and oak were to be reserved for the Royal Dockyards. However, an extensive domestic market existed for Canadian timber, and a black market in pine and oak developed. The demand from this market created a boom in the Canadian timber industry, causing an increased harvest of the navy-allocated forest, particularly along the Ottawa and St. Lawrence Rivers. This initial attempt to assign property rights to forests failed to prevent the development of underground markets and trespass onto the navy reserves. Property rights were defined but not defensible.

In 1826 the colonial government in Upper Canada admitted that the policy of reserving all the best wood for the navy had failed. Subsequently, licences to cut timber were granted, with stumpage dues paid to the Crown based on the volume cut (Lambert 1967). Licensees were required to cut a minimum proportion of their licence within nine months of issue. Timber limit boundaries were not well defined. With no rights to exclude, conflict over harvesting rights and the cutting of timber resulted in competing timber harvesters operating in proximity to one another (Lambert

1967) in some areas.

Harvesters were required to obtain a licence in order to cut timber. The minimum cut requirement resulted in overproduction and low prices in the 1840s. It is doubtful that a planning horizon of nine months gave much of a stewardship incentive to harvesters. Timber harvesting and settlement had also begun to compete for land by the early 1800s. In 1841 an act empowered the government to make grants to settlers from public land that had been identified as having agricultural potential. Settlers were required to clear land for cultivation and construct buildings on each 100 or 200 acre grant. Patent to settled land was withheld from the settlers for five years pending fulfilment of the provisions. Settlers were given more exclusive rights to their land than were timber harvesters. After patents were issued to settlers, the property rights were freely transferable.

Harvesters found that settlers began claiming harvesting areas as property, and forced timber harvesters to pay rents and trespass damages on land from which they had planned to harvest timber. Especially troubling was the emergence of the "bogus-settler". These individuals made down payments on settlement lots, harvested the timber on those lots without paying stumpage, and then defaulted on the provisions of the five year contract and gave up the land. This practice was a result of the fact that harvesters were prevented from bidding for settlement lots. What the timber

harvesters would have done willingly they were prevented from doing, but harvesting was done illegally by the bogus-settlers. The poor definition of boundaries resulted in trespass on the lands of recent settlers. Under pressure from settlers timber harvesters were having to go further to harvest.

In 1849, an Act for the Sale and Better Management of Timber upon Public Lands attempted to address some of the problems facing the timber industry. It stipulated more specific terms for licences, and granted tenure holders the right to exclude others from timber limits. The act introduced the long term lease, under which tenure agreements could be renegotiated on a periodic basis and renewed subject to certain conditions. The act facilitated long term investments. If improvements greater than £6/sq. mile were made, the minimum cut did not apply. Tenures under the 1849 regulations still granted holders only the right to harvest timber. Licensees were allowed to secure their better defined limits from other harvesters and settlers. The results of the regulation ran somewhat contrary to some stated policy goals. Harvesters had an incentive to cut down high quality stands of pine before the government could seize it. The issue of arbitrary subdivision of licensed areas remained unresolved, and when timber harvesters believed that a licence might be subdivided, the area was often quickly stripped of all its best trees before it was lost to settlement (Lambert 1967).

The act of 1849 was first revised in 1851 with the introduction of

ground rents. The purpose of ground rent was to prevent the overproduction that had occurred as a result of minimum cut provisions, and to prevent harvesters from locking up tracts of timber land. Ground rent eliminated the minimum cut requirement, and substituted it with a rental charge based on the area of the timber limit. Initially the ground rent doubled every year in which the timber was not harvested. In 1855 this was replaced with a stumpage charge, because the costs of conserving timber limits had become prohibitive.

A new system of timber licensing was introduced in 1866. The new regulations established an auction system for the allocation of timber limits. Bids were accepted at public auctions. Tracts were surveyed by the Crown, and a reservation price was set. Tenure was perpetual, but only transferable on the approval of the Crown. Exclusive rights to forest tracts, which had been granted in 1849, were discontinued. Owners only had the rights to timber. Others could not be prevented from using timber limits for other purposes. Harvesters could survey timber limits coming up for sale and bid on an open market. This allowed efficient producers to outbid the less efficient ones. This was significantly different from earlier systems, in which timber limits were simply applied for and granted on political or administrative grounds. Perpetual tenure meant that management of forests was no longer constrained to the short term. It encouraged long term investment and better stewardship, the results of which could be enjoyed far into the future.

Post-confederation

In 1867 confederation clarified the role of governments in resource allocation. Section 109 of the British North America Act gave the provinces exclusive control over all natural resources other than those already appropriated by private owners. Section 117 empowered the provinces to "retain all their respective Public Property not otherwise disposed of in this Act" (LaForest 1968). This gave provincial governments a mandate to maintain ownership of public land and allocate resources in the public interest.

Around the turn of the century, popular literature abounded with warnings of an approaching timber famine. The government passed the Forest Reserves Act in 1898. The purpose of the act was to secure large areas of forest from harvest so it could be conserved for the future. Reserves were to be kept in their natural state. Initially, the timber industry was unopposed to the reserves, because the first reservations were composed of cutover lands with little immediate timber potential. The reservations soon expanded and came to include large acreages of valuable timber. In 1901, after the Temagami tract was reserved, pressure was brought on the government to allow timber harvests.

Timber harvest was regulated by the concept of maximal sustained yield. The goal of sustained yield was to achieve a level of cut

which could be harvested every year and replanted in perpetuity. Over time, the application of maximal sustained yield worked toward the development of a forest with an equal area of trees of each age. A fraction of a stand equal to the reciprocal of the rotation age could be harvested each year. This was termed the annual allowable cut.

Sustained yield management implied changes in the property rights of holders of harvest permits. Tenure arrangements now specified the rate at which timber was to be harvested. Perpetual rights were replaced with finite terms. Transfer was only allowed on the consent of the Crown, and no rights were granted to exclude others from timber limits.

Sustained yield management constrained timber harvesters in many ways. The maximal sustained yield model failed to take into account the capital carrying charges associated with delaying timber harvesting. Thus, the annual allowable cut requirement could carry a significant opportunity cost. As well, sustained yield could produce what is known as the allowable cut effect. Binkley (1980) defines the allowable cut effect as "the increase in current harvest due to an anticipated increase in future harvest". The application of sustained yield management was broadened from reserve lands to other public lands in 1929. The Pulp and Paper Conservation Act required all mills to submit an inventory of their timber holdings and to plan all operations on a sustained yield

basis. The trend toward sustained yield was to continue in the negotiation of future forest tenures. In spite of the sustained yield policy, politics continued to be a strong factor in the formulation of timber policy in the early nineteen hundreds. Between 1904 and 1913, permits were issued for the harvest of wood for railway ties, posts, pilings, sawlogs, and pulpwood. The intention of the permits was primarily to provide railway and mining contractors with cheap materials. Permits were awarded on the basis of political patronage (Lambert 1967). This permit arrangement allowed holders to export sawn logs to the United States, a practice illegal under timber licences.

The 1930s saw the government changing forest tenures in an attempt to promote employment in northern Ontario. A variety of regulations were introduced to force pulp and paper companies to maintain jobs in Ontario. As the depression worsened and many pulp mills closed, the government revoked the ban on exports of pulpwood. The most drastic step in regulation came in 1936 with the Forest Resources Regulation Act. It empowered the Crown to seize unused timber licences and to reallocate them to others who could cut timber and thereby employ people (Lambert 1967). Many of the revoked licences were held by companies that were in receivership and could not contest the action. Many of the new licensees were speculators who seized the opportunity of selling cheap timber to the American market (Lambert 1967).

The regulations of the 1930s specified not only what benefits were to accrue to licensees but also who was to be employed in the extraction of the benefits. The requirement to use local labour must have provoked companies to harvest less, because in the absence of regulations they would have hired local labour if it were profitable. Under the 1936 Act, any company holding timber limits but not using them was liable to have them revoked and granted to another party.

After World War II forest resource management began to return to the sustained yield model. The Forest Management Act of 1947 required holders of forest limits to submit detailed operating plans and timber inventories to the Crown. In 1952 the new Crown Timber Act replaced expiring older agreements with Order-in-Council licences that had durations of up to 21 years. In practice, the 21 year tenure functioned as a long term lease, with timber companies making decisions based on the assumption that they were buying the second crop off the land (Moore 1969). Forest tenures increasingly placed the burden of management on licence holders. Licensees were required to build roads on timber limits, and to operate a processing facility or have a contract to supply one. These so-called "operational requirements" lowered the profitability of harvesting. Limit holders were not given the right to exclude others from the roads they built. Licensees were concerned with the reserved right of the government to take over licensed land and the road system when mining was being done in an area, and this

uncertainty deterred the long term planning of a permanent road system that was required for proper land management (Moore 1969).

A government White Paper on forest management was released in 1954. It outlined the fundamentals of future policy initiatives. The report addressed other uses of the forest resource, and outlined plans to develop recreational facilities and wildlife habitat on public lands. The importance of the forest inventory in planning the rate of growth relative to depletion was emphasized, and policy adjustments to put sustained yield management into effect were suggested. The White Paper suggested that the over cutting of spruce might be eased with longer tenure periods, to encourage better management by industry, and to encourage the construction of more processing plants.

There are currently two main types of forest tenure in northwestern Ontario: Forest Management Agreements, and Order-in-Council Licences. Under Forest Management Agreements (FMAs), licensees are given the right to harvest timber and the benefits of the allowable cut effect. The allowable cut effect grants an increase of the current Annual Allowable Cut based on silvicultural treatments that increase future growth. Licensees are required to cut at least 90% of the Annual Allowable Cut, build roads on licensed land, and operate a processing plant or have a contract to supply one (Haley and Luckert 1990). The duration of agreements is either twenty years or on an evergreen (perpetual) basis with renegotiation every

five years. The Crown prescribes the allowable cut and reserves the right to subdivide lands on renegotiation (Haley and Luckert 1990). Tenure transferability is allowed only on approval by the Minister. FMAs can be cancelled or modified by the Minister at any time (Gov't of Ontario 1994a). They account for 70% of provincially administered forests (Haley and Luckert 1990).

Order-in-Council Licences grant licensees the rights to harvest timber. A processing plant must be operated or supplied, and road building is required, but without Crown assistance (Haley and Luckert 1990). The licences have a duration of five to twenty years. As with FMAs, the Annual Allowable Cut is prescribed by the Crown, and licences are only transferable with Ministerial consent. The Crown reserves the right to change the licence, or cancel the licence at any time if performance is deemed inadequate (Gov't of Ontario 1994a, Haley and Luckert 1990).

Wildlife

In Canada, wildlife has been owned by the state since Confederation. This differs from some other jurisdictions. In England, for example, the ownership of wildlife is vested with individuals (Tober 1981), but historically the government of England granted the right to hunt game. This was done via qualification statutes (Lueck 1989), which defined the necessary conditions for the privilege to hunt game. What was specified, in

essence, was the requirement of land ownership (Lueck 1989). Land owners were allowed to hunt only on their own land, which implied exclusive rights, and as such, others could be excluded. The qualification statutes were abolished in 1831 and were replaced by English Common Law. Under Common Law, wildlife is a fully exclusive, exchangeable commodity in which land owners can sell hunting rights and set their own bag limits (Lueck 1989). This legal framework persists in Britain today.

In Canada and the United States, the property rights wildlife are vested with the state (Lueck 1989). State-owned wildlife is allocated to individuals through the issuance of hunting licences and park entry fees. In the United States, property rights to wildlife were originally assigned by free taking. Land owners were never granted exclusive rights to wildlife on their own property. The only means of taking ownership of a wild animal was to kill it. The right to take wildlife as common property in the United States was interpreted to supersede the law of trespass (Lund 1980). By the late nineteenth century, American courts ruled that any lands which were not posted were available to be hunted by anyone (Lund 1980). Thus, state ownership of wildlife took precedence over private ownership of land. In 1896, the U.S. Supreme Court ruled that the state had the right of ownership to wildlife (Lueck 1989, Bean 1983). Thus, the system in which free taking prevailed was replaced by one in which the state held the property rights to wildlife for allocation in the public interest.

In Canada, the British North America Act of 1867 ceded the rights to all natural resources to the provinces (LaForest 1969). Prior to confederation, unfettered free taking was discouraged with attempts at regulation such as the Game Acts of 1821 and 1856 in Ontario. These early legislative attempts to establish public property rights in wildlife were largely unsuccessful due to difficulties in enforcement (Lambert 1967).

In Ontario, although wildlife is the property of the Crown, the Game and Fish Act is superseded by Common Law (Gov't of Ontario 1994b). Private landowners thus have the right to exclude hunters, trappers, and fishermen. An exception is land owned by railway companies. Railway owners have no right to exclude hunters, trappers, or fishermen from their property, and may not charge them for the use of railway lands. A second exception to exclusive rights involves waterways. Under the Game and Fish Act, the ownership of the bed of a navigable waterway does not include the exclusive right of fishing in the water. Conservation officers enforcing the Game and Fish Act may not be excluded from private land.

The principal difference between the emergence of wildlife institutions in Britain and North America relates to scarcity. Early in the heritage of Canada and the United States, large scale scarcity did not require the establishment of well defined property rights. This may have been a contributing factor in the decline of

species such as the passenger pigeon and the buffalo. In areas where scarcity of wildlife occurred, defined property rights usually emerged. Demsetz (1967) describes the emergence of property rights to fur bearing animals with respect to the Montagnes natives of eastern Quebec in the early 1700s. Prior to European influence, property rights to furbearers were not observed because scarcity was not an issue. As the fur trade developed fur bearing animals became scarce. The Montagnes developed an intricate system of hunting rights to resolve conflicts over the fur harvest (Demsetz 1967).

Summary

Timber resources in Ontario have been managed under state ownership since before Confederation. Access to government-owned forest lands has varied substantially over time, but certain aspects of these arrangements have remained more or less constant. In terms of the framework introduced above, tenures have become more clearly defined, have varied in the degree of defendability that they convey, and have not embodied the idea of divestability to any great extent. The politicization of the tenure and allocation system has contributed to uncertainty regarding the long term status of existing tenure agreements. Limited duration of tenures and periodic requirements to harvest minimum wood volumes have shortened the planning horizons of managers and undermined incentives for long term stewardship.

Another theme observed in the history of forest tenures is the separation of the right to harvest timber and the rights to non-fibre resources. Non-fibre resources, such as wildlife, have been allocated separately from their habitat. This has historically resulted in forest policy that gave little incentive for fibre users to make stewardship investments for wildlife. Wildlife institutions have evolved from open access to state ownership. In areas where wildlife scarcity was realized, property right institutions developed. Within the terms of licences, licensees have an incentive to fill bag limits because they have no ownership rights over animals that they do not kill.

Tenure arrangements for timber have generally been defined based on spatial and temporal dimensions. Non-fibre forest values often transcend these temporal and spatial boundaries. Seasonal movements of wildlife often cross timber limit boundaries. Management of non-fibre resources is made more complex by the overlap of wildlife habitat needs and the structure of timber management tenures. Consideration of tenure instruments that better reflect the concepts of definition, defendability, and divestiture would be a positive measure to address these issues.

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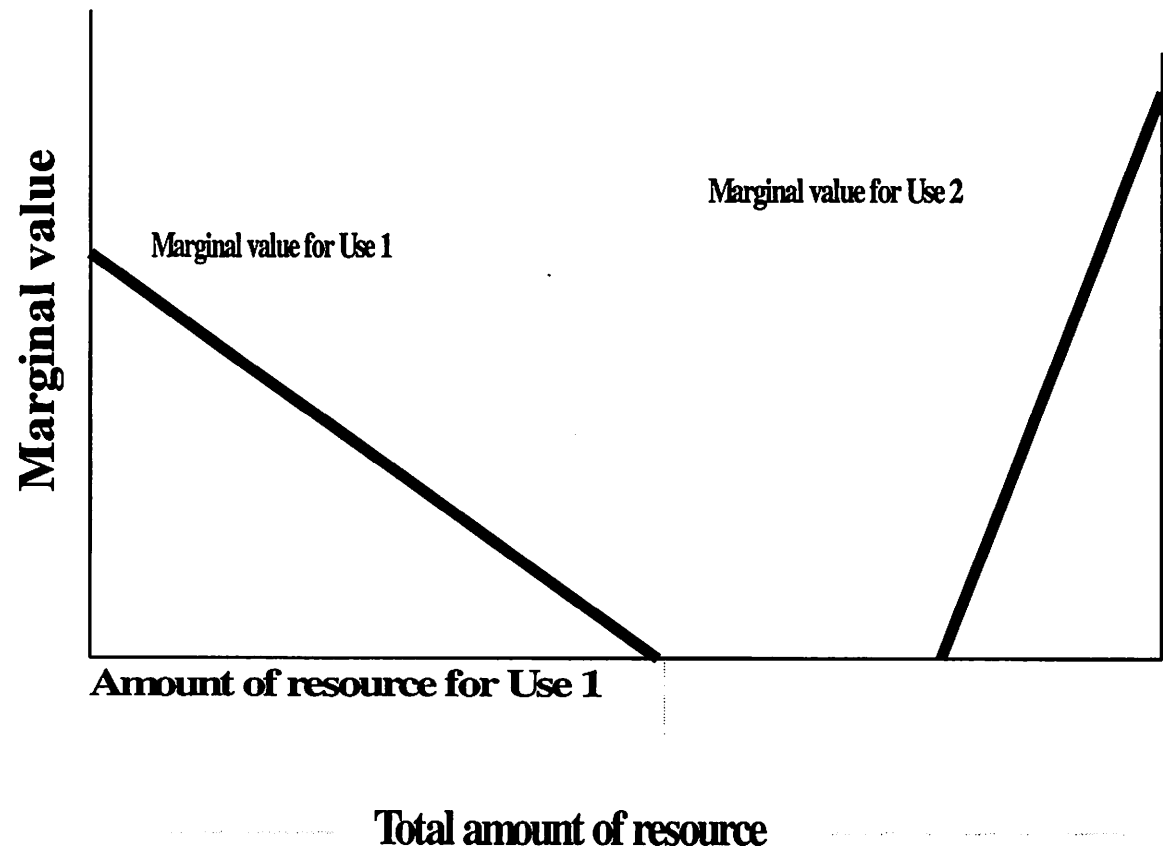
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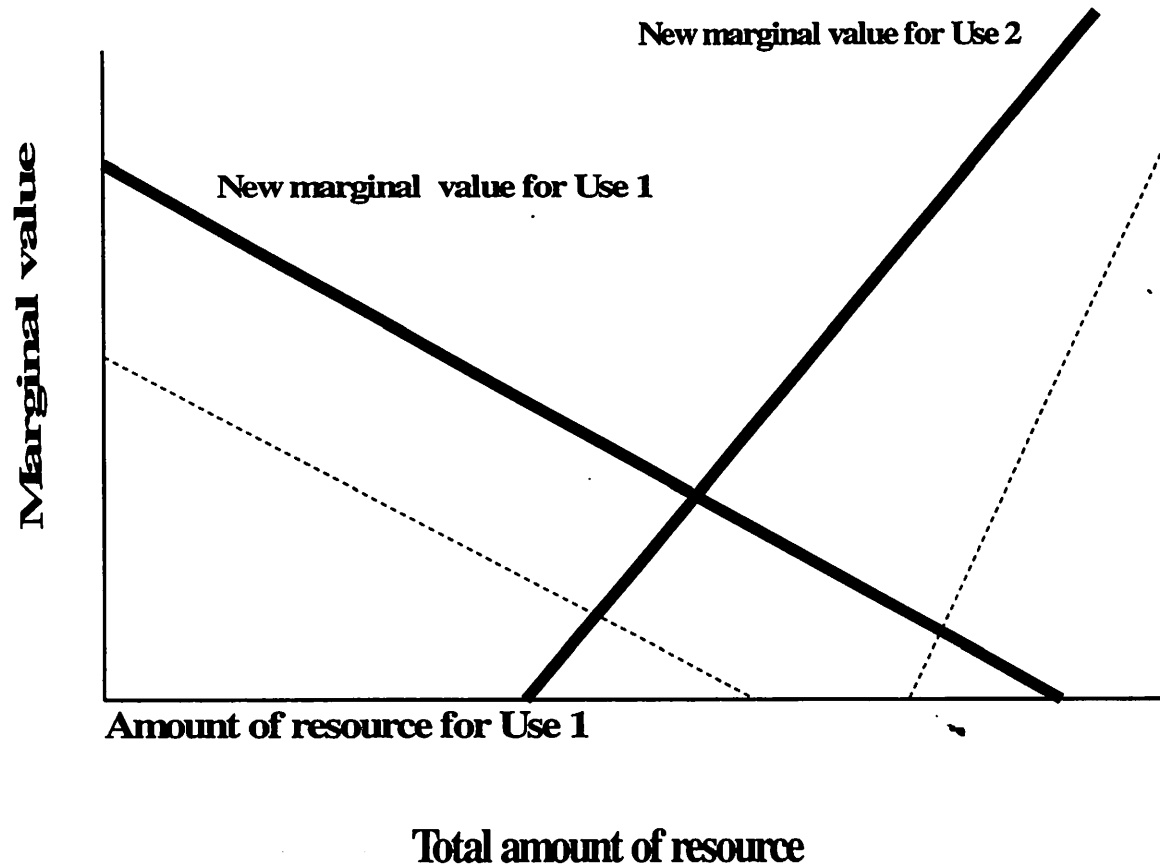
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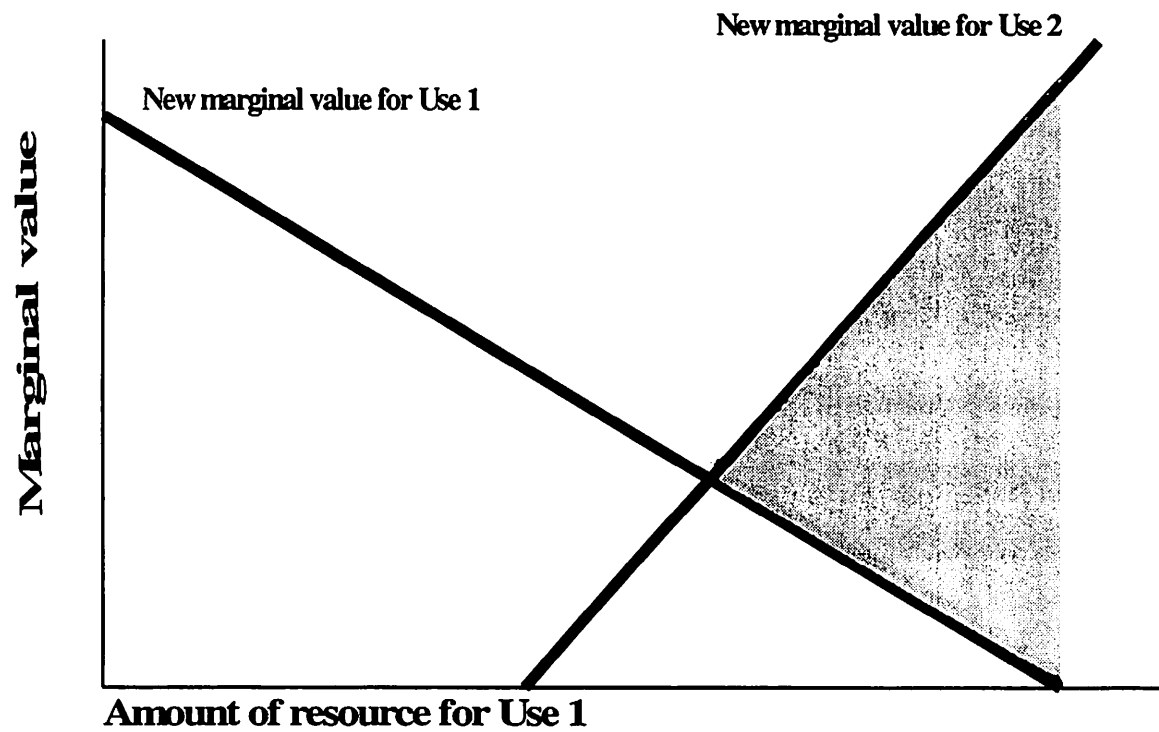
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Total amount of resource