



**Global Trends in Ownership and Tenure of Forest
Resources and Timber Pricing**

By

Dr. Shashi Kant

**Professor, Forest Resource Economics and
Management, Faculty of Forestry**

University of Toronto

33 Willcocks Street

Toronto, Ontario M5S3B3

Canada

Phone: 416-978-6196

Fax: 416-978-3834

e-mail: shashi.kant@utoronto.ca

Prepared for

Ontario Professional Foresters Association

Global Trends in Ownership and Tenure of Forest Resources and Timber Pricing

Executive Summary:

In November 2008, Mr. Tony Jennings, Executive Director, Ontario Professional Foresters Association (OPFA) approached me to write a Lead Paper on Global Trends on Forest Ownership and Forest Tenures, and Timber Pricing, and to present the paper at the annual conference of OPFA, April 23-24, 2009, Sudbury, Ontario. I accepted Tony's proposal, and presented this paper on these three issues at the OPFA meeting in April 2009. I am highly thankful for the OPFA and Tony Jennings for this opportunity and their support during this work.

In this paper we examine three critical aspects – global forest ownership, tenure reforms, and timber pricing mechanisms - related to forest tenures. We found that the argument to privatize Canadian forests, just because we have only 7% of our forests under private ownership, is not based on a comprehensive analysis of global forest ownership. In Canada, we have 26.5 million hectares of private forests, while there are more than two hundred countries whose forest area (of each country) is less than Canada's private forest area, and these include all developed European countries (Sweden, Finland, Germany, France, the United Kingdom, Italy), and Japan and New Zealand. Similarly, the forest industry in Canada own more forestland available for wood supply than any other developed country (including Finland, France, Germany, Italy, Japan, New Zealand, Norway, Switzerland and the United Kingdom), except for the USA and Sweden. Among G8 countries, the Canadian forest industry owns more than double (about 3.7 million hectares) of the forestland own by the forest industries (about 1.5 million hectares) in six other (except the USA) member countries – Japan, Germany, France, Italy, the United Kingdom, and Russian Federation. Forest industry does not own any forestland in France, Germany, Netherlands, and Switzerland and in another three countries – Belgium, Italy, and the United Kingdom, the forest industry ownership is less than or around 1% of forestland. There is also no direct relationship between the private forest ownership and the ranking of forest industry in terms of their economic performance. In the top 10 companies of the PwC Top 100, there are three companies from the USA, three from Finland, two from Japan, one from Sweden, and one from Ireland. The forest area in Finland, Japan, Sweden, and Ireland is less than private forest area in Canada, and the forest area of Ireland is only 0.67 million hectares which is close to a rounding error of the Canadian forest area. In addition, the forest industry in Finland, Japan, and Ireland own less forest land in total than that owned by the forest industry in Canada.

During the 1980's and 1990's, the intensity of change in forest tenures was quite high. These changes in forest tenures were dominated by market forces in developed countries and by local peoples' rights and livelihood in developing countries. Forest tenure changes due to market forces are grouped into six broad categories: (i) changes in the ownership of forestland (USA and economies in transition); (ii) forest tenure leading to forest management by state-owned company (Sweden); (iii) commercialization, corporatization, and privatization of plantations and not natural forests (New Zealand, South Africa, and Australia); (iv) creation of forest enterprises within the state forestry agencies (the United Kingdom, Germany, and many countries in transition economies); (v) change in forest tenures in pre-communist countries (China, Chile, and

economies in transition); and (vi) forest concessions to private companies on public forestland (Brazil).

The change in forestland ownership (TIMOs and REITs) in the USA is mainly driven by the federal tax laws and accounting procedures, and the better economic performance of TIMOs and REITs does not necessarily mean improved economic efficiency in forest management. In the USA, a large proportion of private forestland (about 10 million acres) has been also sold to environmental groups, such as Nature Conservancy. The main objective of change in forestland ownership in economies in transition is the restitution of forest ownership back to the pre-communist era, and forest ownership is being transferred to diverse groups including individual households, religious and educational institutions, local governments, community organizations, and communes, and not the forest industry. Restitution in Canada will mean recognition of Aboriginal and Treaty Rights.

In Sweden, Sveaskog AB, a state company created in 2001, owns 3.2 million hectares of productive forestland (about 15% of Sweden). Sveaskog AB manages forests for multiple functions, and is involved in activities related to selling and buying wood, provision of seedlings and other forest management services, lease of land and water assets for the purposes of hunting rights and fishing rights, and establishment of wind power. This is an excellent example to prove that the ownership of forest or business is immaterial.

Privatization related reforms, in New Zealand, Australia, and South Africa were related to plantations and not natural forests, and only the ownership of existing trees, not land was sold. The total plantation areas involved in each country were in the range of 100,000 to 500,000 hectares, and even for such a small area it was not easy to find buyers. In the case of New Zealand, it took almost 7-8 years to sell about 500,000 hectares, and the seller had to resort to bilateral negotiations due to an absence of bids, resulting in a debatable sale price. In the end, about 4 percent of the total plantations marked for sale were not sold and the Crown Forestry Management Ltd was created to manage these plantations. Similarly in South Africa, the first sale in 2001 saw only 90,377 sold of the 321,826 hectares of plantation offered for sale. In Australia, only one state – Victoria - went ahead with the sale of plantations, and sold only 114,000 ha of softwood plantations. The UK decided against the sale of plantations due to the lack of interested buyers, opposition from the forest industry, non-interest by industry to commit their capital which they deemed could be used more profitably, and the time required for the sale of 1 million hectares. There are many critical issues against the privatization of plantations - valuation of plantations, productivity of forest land and return on capital, availability of capital, lack of interested buyers, and the organization of the sales process.

Some countries have corporatized some forestry operations - plantations and cash crops in India, plantations in New Zealand, South Africa, and Chile, and some commercial activities, specifically plantations, in South Australia, Queensland and Victoria. There is no study providing conclusive evidence about the better performance of these corporations compared to state agencies in any country. There is anecdotal evidence - VicForests, a corporation of Victoria, Australia, made a net profit in two years and loss in one year since its creation. Similarly forest corporations in India are not well reputed for their economic performance.

The creation of a separate state enterprise (SE) within the state forestry agency is the most dominant model of recent forest tenure reforms. Many countries, such as the United Kingdom, Germany, many states in Australia, and many countries from transition economies (such as Croatia, Latvia, Estonia, Romania, Slovakia) have created state enterprises for commercial activities within the forestry agencies. The creation of a state enterprise, as compared to corporation and privatization, has some advantages. There is no need for valuation of forest assets, no need of capital and buyers, flexibility for state agencies in terms of division of responsibilities, and high acceptability by all groups. However these state enterprises can be criticized for lack of professionalism, government control, and the same organizational culture as the state agencies.

In fact there is very little empirical evidence in support of organizational structures, by themselves and in isolation, being the key element to a successful tenure reform process. The evidence strongly suggests that the functional form of a forest organization simply does not matter. These observations are fully supported by the diversity of forest tenure reforms in China, and different approaches taken by various ex-communist countries from Europe. The case of forest concessions to private companies on public forests in Brazil provides a good example of the use of the Canadian system of forest licenses in other countries.

Timber pricing is not like the pricing of milk, cake or vegetables. Heavy transportation costs, diversity of forest ownership, including government and forest industry, and their different economic and management interests, and externalities associated with timber harvesting assure that perfectly competitive market will never exist for timber. Hence, the choice of timber pricing mechanisms means the selection of the second-best mechanism, and there is no evidence to suggest that timber auctions or timber auction based calculations of stumpage will always be better than the residual value based stumpage system. All the candidates of the second-best pricing mechanisms have their merits and demerits, and forest managers' challenge is to select the pricing mechanism which has the highest potential to be the second best in the given forest, social, and economic conditions.

In conclusion, forestry in this century, specifically in the next two or three decades, is going to be drastically different than forestry in the last three decades. Hence, the Canadian policy makers and forest managers have to develop innovative forest tenure arrangements. We suggest some key elements/guiding principles and actions towards the design of these tenures. New forest tenures should be designed: (i) keeping the future, and not the past, of forestry sector in perspective; (ii) for multiple attributes of forests and not only for timber; (iii) to provide flexibility, diversity, and adaptiveness; (iv) to foster competitiveness among the forest industry and not to provide life-saving support to non-competitive forest industries; (v) for economically optimal timber supply and not for timber supply based on AAC; (vi) to maximize the value of harvested timber and not to maximize the harvest; and (vii) to recognize and deal with the non-separation of forest management and timber allocation and harvest.

Any effort towards the sale of forest land to forest companies in Canada will not only be environmentally, socially, and politically unacceptable, but it will not be economically justifiable. In order to select the appropriate organizational form, such as state business enterprise, corporation, or state-owned company, for Ontario and other provinces, a SWOT

(Strengths, weaknesses, opportunities, and threats) analysis of all possible functional forms will be a good starting point. In addition, provincial governments should convene expert groups, without representatives of the direct stakeholders, on forest tenures. The mandate of these groups should be an in-depth SWOT analysis of all institutional and organizational options.

Introduction

The subject of forest tenures is an evergreen matter in Canada, and the never-ending softwood lumber dispute is always there to add new spices to the discussion, and provide momentum for fresh calls for privatization in forest tenures in Canada. In recent time, specifically after the Sustainable Forest Management Network funding in 2004 to a multi-province project on forest tenures titled “The Challenges of Institutional Redesign: Tenure, Competitiveness, and Sustainability”, the issue of forest tenures has attracted more focused attention from many researchers. In the last two years, after the down turn in the housing market in the USA and the global recession leading to closure of many forest mills in Canada, forest tenures have also drawn the serious and focused attention of policy makers and professional associations. In 2008, L’Ordre des ingénieurs forestiers du Québec (OIFQ) organized a two-days (March 26-27) workshop on ‘Diversifying Forest Tenure Systems’ in Quebec City. Professor Ilan Vertinsky, Project Leader of the SFMN project, and his colleagues organized a National Forest Tenure Workshop on June 9 and 10, 2008, in Vancouver. In 2009, the Ontario Forest Industry Association (OFIA) organized a panel discussion on forest tenures in its annual meeting on February 18, 2009.

In November 2008, Mr. Tony Jennings, Executive Director, Ontario Professional Foresters Association (OPFA) approached me to write a Lead Paper on Global Trends on Forest Ownership and Forest Tenures, and Timber Pricing, and to present the paper at the annual conference of OPFA, April 23-24, 2009, Sudbury, Ontario. I accepted Tony’s proposal, and presented my paper on these three issues at the OPFA meeting in April 2009. I am highly thankful for the OPFA and Tony Jennings for this opportunity and their support during this work. All these efforts, including this paper, signify the importance of forest tenures in Canada.

In the Canadian context, “forest tenure” is sometimes interpreted as the provincial governments’ mechanisms for timber allocation from crown forests. This is a very narrow interpretation. These timber allocation mechanisms are only one of the elements of forest tenure. Forest tenure is quite a broad concept, and includes ownership, management, and allocation or distribution of all ecosystem goods and services provided by forest ecosystems including timber and non-timber products. In the broadest sense, forest tenures are property right arrangements related to forest resources, and “rights” can never exist without associated “duties”, and therefore forest tenures are specifications of “rights” and “duties” related to forest resources. For example in Ontario, timber harvesting rights are allocated to private companies through Sustainable Forest Licenses (SFLs), and these SFL holders have many duties with respect to timber harvesting as well as forest management, road maintenance, monitoring and reporting. All these duties are not specified only through SFLs, but also through other instruments such as the Crown Forest Sustainability Act, the Forest Management Planning Manual, and various guidelines related to forest management. All these instruments, which specify rights and duties of SFL holders, are an integral parts of forest tenures. Hence, forest tenures are very complex sets of rights and duties for all groups associated with forest.

The complexity of forest ecosystems further enhances the complexity of forest tenures. Up to the late eighties in Canada, forest management was considered as timber harvest scheduling only, and the focus of forest tenures was the specification of rights and duties

associated with only timber. However, with the emergence of the concept of Sustainable Forest Management (SFM), and its endorsement by the Canadian Council of Forest Ministers (CCFM 1992) and provincial and federal governments, the focus of forest management has shifted from timber harvesting to management of forest ecosystems. This fundamental shift in the concept of forest management has resulted in new legal instruments for forest management, such as the Crown Forest Sustainability Act (1994) in Ontario, and the new forest tenure arrangements in Canada.

There is a dominant belief among academics that provincial governments have not risen to the challenge of SFM by developing new and innovative tenure arrangements (Haley and Nelson, 2007), and that forest tenure systems may have played a significant role in the decline of the Canadian forest industry (Minister's Council on Forest Sector Competitiveness 2005). The dominant proposed cause for the unsatisfactory performance of existing tenure systems is the increased duties of tenure holders, leading to enhanced compliance costs that resulting in high timber production costs (Haley 1996 and Clarke 1997). However, this evaluation is only based on an economic perspective of SFM and there is no consideration of two other – ecological and social - dimensions. In a very informative study, Rong (2008), evaluated the effects of tenure characteristics on maintaining or enhancing competitiveness, environmental integrity and community stability (all 3 dimensions of SFM) through a survey of 127 industry and 36 government representatives throughout Canada. He found that respondents were satisfied with some of the current tenure characteristics while indifferent to others. In addition, for improvement to forest tenures, respondents consistently agreed that attenuating tenure characteristics would negatively affect competitiveness but they held differing perceptions with respect to environmental integrity and changing tenure characteristics. Similarly, many scholars have argued that lack of security of tenure has a negative impact on competitiveness and sustainability of forests (Haley and Nelson, 2007). However, Rong (2008) found that industry representatives were satisfied with the current duration of tenure. Arnot (2007), using data from a Canada-wide survey of 107 forest tenure holders, found that perceived incentives for investment in timber processing facilities, but not in forest management (silviculture), are influenced by overall security of tenure. Hence, security of tenure may have different implications for competitiveness and environmental dimensions of SFM.

These and many other similar findings which contradict simple theoretical economic arguments suggest that the issue of the Canadian forest tenures is not a simple economic text book case, and it involves multiple dimensions – multiplicity of forest resources attributes, diverse characteristics of stakeholders, three dimensions of SFM, and dynamics of all these dimensions. For example, forest resources have multiple attributes; some of those are private goods, such as timber, some public goods, such as environmental and ecological services; some common-pool goods such as fruits, berries and leaves, and some club goods, such as recreation. The presence of these multiple attributes, specifically public goods, means that market mechanisms alone may not be able to produce socially optimal outcomes, and government regulation may be necessary to correct externalities. Similarly, markets are emerging for new goods and services, such as bio-composites, bio-chemicals, bio-energy, carbon, watershed services, and biodiversity, while the markets for traditional forest products, such as pulp and paper and softwood lumber products, are shrinking. In addition, new players such as Brazil, Indonesia, Malaysia, and China are emerging, in existing markets for traditional products, such

as pulp. Hence, the focus of forest tenure discussions should be to develop the basic design principles of forest tenures to meet future challenges. We can learn from our experiences and other countries' experiences, but we should not try to replicate them because the future will be totally different than the past. Similarly, we should not argue to modify our tenure system because other countries have done so. Our argument should be that to meet future challenges and to be future leaders, we need innovations in our forestry sector, including innovations in forest tenures. Hence, the solution of our forest tenure problems is not to adopt a forest tenure system from other jurisdictions, such as the USA, New Zealand, or Australia, and implement it in Ontario, Quebec, or Alberta. Solution lies in designing an innovative tenure system, made in Ontario or Canada, which will provide socially optimal outcomes in emerging local and global social, environmental, and economic conditions.

The main purpose of this paper is to make a serious move in this direction, and not to provide a framework for future forest tenures of Canada. We will analyze at the global level three critical aspects related to forest tenures – forest ownership, trends in forest tenures, and timber pricing mechanisms, and will discuss a few key elements of future forest tenures. The remaining paper is divided into four sections – section 2 is on forest ownership, followed by section 3 with a review of forest tenures. Section 4 is on timber pricing mechanisms, and the final section provides a conclusion and discusses key elements of future forest tenures.

2.0 Forest Ownership

The ownership of forest land is an important ingredient to the design of forest tenure arrangements. In recent years this has attracted global attention. White and Martin (2002) published an analysis of the world's forest ownership, and Sunderlin, Hatcher, and Liddle (2008) analyzed the change in global forest ownership from 2002 to 2008. Both reports are subject to the limitations posed by the availability of accurate data of forest ownership, and Sunderlin et al. (2008) recognized this in their analysis. Irrespective of the accuracy of the data, about 75% of the global forest is under public ownership and 14% under private ownership while the remaining is under some form of community regime which may be publicly owned and designated for community use, owned by local governments (as in the case of China), or owned by communities and indigenous people. The only indisputable conclusion presented by Sunderlin et al. (2008), despite data issues, is that “today, forest area managed under customary tenure greatly exceed the area of community and indigenous lands acknowledged by statutory tenure law.”

In the context of Canada, the issue of customary tenure is critical with respect to Aboriginal and Treaty rights but the focus of this paper is not on customary tenure, and therefore we move to the main issue of our interest. The most common relevant observation for our context is that in Canada the proportion of government-owned forestland is much greater than that of other G8 countries (except Russia) or of any other developed nation with a substantial forest area (Haley and Nelson, 2007; Luckert et al. 2008; and Mandel-Campbell, 2009). This observation is interesting and true, but the information contained in this observation is highly limited and cannot be used for addressing any tenure issue without examining its full context.

First, generally, the Canadian forest ownership is discussed with reference to total forest area - about 402 million hectares – of which 93% is publicly-owned (77% provincial and 16%

federal) and 7% privately-owned. Hence, Canada has 26.5 million hectares of privately-owned forestland. However, out of 402 million hectares of forestland, only about 235 million hectares of forest (58% of total forests) is commercially timber productive forests and 26.5 million hectares of this is under private ownership, and therefore about 11.2% of commercial productive forest is under private ownership. Second, about 10% of the global forest area (3,952 million hectares) is in Canada, and Canada not only belongs to the Group of 8 (G-8), but also belongs to the group of ten most forested countries (F-10). Due to this membership of F-10 countries, even only 7% of the total forest area of Canada, under private ownership, may be much larger than the total forest area of many developed countries, and definitely larger than the private forest areas in almost all developed countries except the USA. Hence, next we examine the forest ownership in details for F10 and G8 countries.

2.1 Ownership of Forests in F10 and G8 Countries

The forest ownership distribution for F10, G 8, and selected other developed countries that are important from a forestry perspective are presented in Table 1. On the basis of the data presented in this table, we can identify many key features of forest ownership distribution. First, among F10 countries, only Brazil and the USA have more privately-owned forestland than Canada. Second, private forest land in Canada (26.5 million hectares) is much more than private forestland in any other developed country including Australia (17.24mha), Finland (15.6mha), France (11.19mha), Germany (4.98mha), Japan (14.44mha), New Zealand (2.4mha), Sweden (18.63mha), and the United Kingdom (1.40mha), and only USA has more private forestland than Canada. Third, in many developed countries, including Sweden, Japan, Finland, Germany, France, Italy, New Zealand, and the United Kingdom, the total forestland is less than the private forestland in Canada. Fourth, four European countries combined, which are members of the Group of Eight (G-8) (France, Germany, Italy, and the UK), have less private forestland than private forestland in Canada.

Table 1: Forest Ownership Distribution in Most Forested Countries, 2008

Country	Total	Public		Private	
	M Hectares	Administered by Government	Designated for use by communities and Indigenous peoples	Owned by Communities and Indigenous people	Owned by individuals and firms
Russia	882.98	882.98	0.00	0.00	0.00
	%	100.00	0.00	0.00	0.00
Brazil	421.31	88.56	25.62	109.13	198.00
	%	21.02	6.08	25.90	47.00
Canada	402.08	374.14	0.00	1.46	26.48
	%	93.05	0.00	0.36	6.59
United States	303.08	129.16	7.46	0.00	166.46
	%	42.62	2.46	0.00	54.92
China	172.79	72.85	0.00	99.94	0.00
	%	42.16	0.00	57.84	0.00

Australia	147.39	109.30	0.00	20.85	17.24
	%	74.16	0.00	14.15	11.70
DRC	133.61	133.61	0.00	0.00	0.00
	%	100.00	0.00	0.00	0.00
Indonesia	123.83	121.89	0.23	0.00	1.71
	%	98.43	0.19	0.00	1.38
Peru	63.11	42.34	2.86	12.62	5.29
	%	67.09	4.53	20.00	8.38
India	67.55	49.48	17.00	0.00	1.07
	%	73.25	25.17	0.00	1.58
Sum of F10	2717.73	2004.31	53.17	244.00	416.25
	%	73.75	1.96	8.98	15.32
Sweden	23.00	4.37	0	0	18.63
	%	19.00	0.00	0.00	81.00
Japan	24.97	10.24	0	0.29	14.44
	%	41.01	0.00	1.16	57.83
Finland	26.30	10.7	0	0	15.6
	%	40.68	0.00	0.00	59.32
Sum of F25	3240.75	2408.18	75.96	295.77	460.84
	%	74.31	2.34	9.13	14.22
Germany	10.74	5.76			4.98
	%	53.63			46.37
France	15.16	3.97			11.19
	%	26.19			73.81
Italy	9.86	3.35			6.51
	%	33.98			66.02
UK	2.47	1.07			1.40
	%	43.32			56.68
Sum of EG 4	38.23	14.15			24.08
	%	37.01			62.99
Sum of G8	1651.3	1410.7	7.5	1.8	231.5
	%	85.43	0.45	0.11	14.02

Notes:

The main data source for this Table is Sunderlin, Hatcher, and Liddle (2008). The data for countries not included in Sunderlin, Hatcher, and Liddle (2008) are from United Nations (2000).

F25 are the 25 countries out of 30 most forested countries for which data were available in Sunderlin, Hatcher, and Liddle (2008).

EG4 is a group of four European countries (France, Germany, Italy, and the United Kingdom) which are members of the Group of Eight (G8).

Sweden, Japan, and Finland are among the top 30 most forested countries, and the numbers in parenthesis represent their respective ranking in terms of total forest area.

The numbers presented in Table 1, and the key features discussed above provide some interesting trends in terms of private and public ownership of forests in developed and most forested countries. However, these numbers and features are not sufficient to understand the

complexity of forest ownership with respect to timber production. Hence, next we examine the ownership of forests available for wood supply.

2.2 Ownership of Forests Available for Wood Supply.

Details of ownership of forests available for wood supply are given in Table 2. In this table, we separate Aboriginal and Tribal ownerships from private ownership, and we divide private ownership in three categories - individuals, forest industry, and other private institutions.

Table 2: Ownership of Forests Available for Wood Supply (area in 000 hectares)

Country	GrandTotal	In public ownership			Owned by indigenous or tribal peoples	In private ownership			
		Total	State Ownership	Other public institutions		Total	Owned by individuals	Owned by forest industries	Owned by other private institutions
Belgium	640	276	69	207	0	364	352	1	10
	%	43.13	10.78	32.34	0.00	56.88	55.00	0.16	1.56
Finland	20675	5,164	5,164	0	0	15,511	12,936	1,613	962
	%	24.98	24.98	0.00	0.00	75.02	62.57	7.80	4.65
France	14470	3,787	1,467	2,320	0	10,683	8,983	0	1,700
	%	26.17	10.14	16.03	0.00	73.83	62.08	0.00	11.75
Germany	10142	5,406	3,390	2,016	0	4,736	4,736	0	0
	%	53.30	33.43	19.88	0.00	46.70	46.70	0.00	0.00
Italy	6013	2,044	372	1,672	0	3,969	3,917	52	0
	%	33.99	6.19	27.81	0.00	66.01	65.14	0.86	0.00
Netherlands	314	160	115	45	0	154	65	0	89
	%	50.96	36.62	14.33	0.00	49.04	20.70	0.00	28.34
Norway	6609	853	664	189	0	5,756	5,123	261	372
	%	12.91	10.05	2.86	0.00	87.09	77.52	3.95	5.63
Sweden	21236	1,904	404	1,500	0	19,332	10,916	8,416	0
	%	8.97	1.90	7.06	0.00	91.03	51.40	39.63	0.00
Switzerland	1060	700	10	690	0	360	321	0	39
	%	66.04	0.94	65.09	0.00	33.96	30.28	0.00	3.68
UK	2108	965	885	80	0	1,143	800	25	318
	%	45.78	41.98	3.80	0.00	54.22	37.95	1.19	15.09
Total	83,267	21,259	12,540	8,719	0	62,008	48,149	10,368	3,490
	%	25.53	15.06	10.47	0.00	74.47	57.82	12.45	4.19
Tot Europe	149054	64,807	52,704	12,104	0	84,247		10,616	
	%	43.48	35.36	8.12	0.00	56.52		7.12	
Total EU15	95526	25,351	14,930	10,421	0	70,175		10,355	
	%	26.54	15.63	10.91	0.00	73.46		10.84	
Russian Fed	525,191	525,191	525,191	0	0	0	0	0	0
	%	100	100	0	0	0	0	0	0
Canada	125,223	104,370	104,215	155	640	20,853	17,126	3,727	0
	%	83.35	83.22	0.12	0.51	16.65	13.68	2.98	0.00
USA	194,976	53,215	39,115	14,100	3,147	141,761	105,745	28,513	7,503
	%	27.29	20.06	7.23	1.61	72.71	54.23	14.62	3.85
Japan	23,276	9,540	6,975	2,565	0	13,736	9,931	1,470	2,335
	%	40.99	29.97	11.02	0.00	59.01	42.67	6.32	10.03
Total G8	901,399	704,518	681,610	22,908	3,787	196,881	151,238	33,787	11,856

	%	78.16	75.62	2.54	0.42	21.84	16.78	3.75	1.32
TotalEG4	32,733	12,202	6,114	6,088	0	20,531	18,436	77	2,018
	%	37.28	18.68	18.60	0.00	62.72	56.32	0.24	6.17
Australia	16433	9,413			4	7,020			
	%	57.28			0.02	42.72			
New Zealand	1851	453	403	50	0	1,398	117	603	678
	%	24.47	21.77	2.70	0.00	75.53	6.32	32.58	36.63

Notes:

The main data source for this Table is United Nations (2000).

EG4 is a group of four European countries (France, Germany, Italy, and the United Kingdom) which are members of the Group of Eight (G8).

Similar to the total forest land ownership, the ownership of forests available for wood supply also has some key features. First, the private ownership of forestland available for wood supply is dominated by individual ownership, and forest industry ownership is minimal in most countries except the USA and Sweden. In the 10 European Countries included in Table 2, private individual landowners own 57.82% of forestland available for wood supply while forest industry owns only 12.45% of forestland. In all European countries together, the total private ownership of forestland available for wood supply is 56.52% while only 7.12% is owned by the forest industry. In 15 European Union countries, the total private ownership of forestland available for wood supply is 73.46% while only 10.84% is owned by the forest industry. Second, in many developed countries, such as France, Germany, Netherlands, and Switzerland, the forest industry does not own any forestland and in another three countries – Belgium, Italy, United Kingdom, the forest industry ownership is less than or around 1% of forestland. Only in Sweden is private forest industry ownership as high as 40% while ownership of private landowners is around 51%. Third, the forest industry in Canada own more forestland available for wood supply than in any other country (including Belgium Finland, France, Germany, Italy, Japan, New Zealand, Norway, Switzerland and the United Kingdom) included in Table 2, except the USA and Sweden. Fourth, among G8 countries, the Canadian forest industry owns more than double (about 3.7 million hectares) of the forestland own by forest industries (about 1.5 million hectares) in six other (except the USA) member countries – Japan, Germany, France, Italy, the United Kingdom, and Russian Federation. Finally, in terms of industrial ownership of forest land, only two countries – the USA and Sweden - are ahead of Canada, and all other countries are behind Canada.

2.3 Key Features of Forest Ownership

In summary, the most common picture of private versus public forest ownership presented by many people is opaque. The argument to privatize Canadian forests because we have only 7% of our forests under private ownership, is not based on a comprehensive analysis of global forest ownership. As stated above, in Canada we have 26.5 million hectares of private forests, and there are more than two hundred countries whose forest area (of each country) is less than Canada's private forest area, and these two hundred countries include all developed European countries and Japan, New Zealand, South Africa, South Korea, and Malaysia.

There is also no direct relationship between private forest ownership and the ranking of the forest industry in terms of their economic performance as measured by sales, a measure used by Price Waterhouse and Coopers. Within the top 10 companies of the PWC Top 100 (2008), there are three companies from the USA (International Paper, Kimberly-Clark, and Weyerhaeuser), three from Finland (Stora Enso, UPM, and Metsaliitto), two from Japan (Oji Paper and Nippon Unipac), one from Sweden (Svenska Cellulosa), and one from Ireland (Smurfit Kappa). The forest areas in Finland, Japan, Sweden, and Ireland are less than the private forest area in Canada. In fact the forest area of Ireland is only 0.67 million hectares, which is close to a rounding error of the Canadian forest area. In addition, Mondi Group (UK/South Africa) was ranked eleventh and Domtar (Canada) was ranked fifteenth while the total forest area of the UK and South Africa combined is only 12.0 million hectares against 26.5 million hectares of private forest land in Canada. Similarly, in terms of ROCE, Kimberly-Clark (Mexico) has the second highest return (20.3%) and four companies from China have returns close to 10%

- Lee and Mann (15%), Sino Forest Corporation (12.8%), Shan Dong Sun Paper (9.2%), and Shandong Huatai Paper (8.4%) while there is almost no private forest area in China. Hence, there appears to be no strong relationship between private ownership of forests and the economic performance of forest companies within that country. Finally, as we stated earlier, the Canadian forest industry own more forest land than found in any other country except the USA and Sweden. Therefore the poor performance of the Canadian forest companies, as compared to Finland, Japan, Ireland, or any other country, cannot be attributed to the lack of forest ownership by forest companies. In addition, some companies in the USA (Kimberly-Clark, Rayonier, and Sonco) and Sweden (Setra group, Sodra, and Holmen) have ROCE close to or greater than 10% while many companies from the same countries have very low ROCE - Louisiana-Pacific –USA (-2.9%), Verso –USA (0.4%), Wausau-Mosinee Paper -USA (1.4%), and Kinnevik - Sweden (1.6%). Even within the Canadian forest industries, the ROCE ranged from 5.7% (Mercer International) to -11.9% (Fraser Paper). In fact, the economic performance of any company depends upon a wide range of factors including demand and supply side market forces, a firm's internal strategies, the overall business environment in the country, innovations, etc. Hence, next we will examine the recent changes in forest tenures in some selected countries. However, before we move to the next section, it is worth mentioning that the Government of Sweden has 50% ownership in the Setra Group which had the highest ROCE (25.2%) in 2007.

3.0 Recent Trends in Forest Tenures

Generally, forest tenures, similar to any other institution, are not static, and the main drivers of the dynamics of forest tenures are economic, social, political, and ecological factors. However, in the most cases, institutional changes are incremental only due to institutional as well as organizational inertia, inherent in the structure of institutions and organizations, respectively. Only some drastic events, such a wars, economic collapse, political collapse, social upheaval, lead to non-incremental or discontinuous or transformational institutional and organizational changes.

In the case of forest tenures, generally you observe the same feature – mostly incremental changes and few non-incremental changes - throughout the history. However, it seems that during the 1980's and 1990's, the intensity of change in forest tenures was much higher than the intensity in the previous decades. Two opposing factors – one focused on market forces and economic efficiency and other on rights and livelihood of rural, tribal, and forest-dependent people – were dominant during these two decades, but these were complemented by ecological factors, specifically after 1992 Rio Summit. Hence, ecological factors are a common thread among dynamics of global forest regimes, specifically after 1992, but the two dominant factors resulted into two different patterns in the change of global forest tenures. In developed countries, forest tenure changes were dominated by market forces while in developing countries local peoples' rights were the dominant factor. In the paper, our focus is on market forces, and therefore we will examine changes in forest tenures in many countries where market forces were the dominant factors behind these changes, and examine only two cases where the dominant factors were local peoples' rights and livelihood.

The changes in forest tenures due to the dominance of market forces can be grouped into six broad categories: (i) changes in the ownership of forestland itself; (ii) forest tenure leading to

forest management by state-owned company; (iii) commercialization, corporatization, and privatization of plantations; (iv) creation of forest enterprises within the state forestry agencies; (v) forest concessions to private companies on public forestland; and (vi) change in forest tenures in pre-communist countries. The specific cases related to these six categories are discussed next. That is followed by the discussion of two cases (India and Nepal) of forest tenure changes where local people's rights were dominant factors.

3.1 Change in the Ownership of Forest Land

3.1.1 Timber Investment Management Organizations (TIMO) and Real Estate Investment Trusts (REIT) in the USA

Many vertically integrated forest products companies (VIFPCs), such as Georgia-Pacific, International Paper, Weyerhaeuser, Bowater, and Louisiana-Pacific, started selling their forestlands in 1985, and many institutional investors, such as public pension funds, private pension funds, foundations, and some endowments (Harvard University, Yale University, and Hughes Medical Institute) have made increasing investments in these forestlands. These changes in forestland ownership have three main features.

First, many VIFPC sold a large part of their forestland holdings to "Timber Investment Management Organizations" (TIMOs) which buy, manage and sell forests and timber on behalf of some institutional investors, such as pension funds and insurance companies. These TIMOs do not own land, and land is owned by individual investor groups. Second, some VIFPCs sold their forest landholdings to family owned forest products companies, and various government and non-government organizations. By 2006, about 15 million acres was sold to TIMOs, 2 million acres to privately held forest products companies, and about 10 million acres to different conservation groups, such as Nature Conservancy, the Conservation Fund and some government agencies (Hickman, 2006). Third, many VIFPCs went through the restructuring process of legally separating ownership and control of forestland and timber from ownership and control of manufacturing facilities. In these cases forestland is now owned by "Real Estate Investment Trusts" (REITs) which buy, manage, and sell real estate or real estate related assets on behalf of private investors.

In many ways, this shift has been significant. For example, by 2005 as compared to 1980, the VIFPCs land holdings reduced by 60% - from 58 million acres to 21 million acres (Boyd, Gary P. 2006). In contrast, over this same period the holdings of the TIMOs and REITs grew from nothing to over 25 million acres. The holdings of the TIMOs and REITs are spread across all forest regions but the biggest concentration is in pine plantations in the Southeast, conifer plantations in the Pacific Northwest, and mixed softwood and hardwood stands in the Northeast (Block, Nadine E. and Sample, V. Alaric. 2001). However, in the overall picture of forestland ownership in the US, TIMOs and REITs hold only a very small proportion (about 5%) of all the timberland (Hickman 2006).

The researchers have attributed this change to various factors but the two main reasons are related to different treatments of different types of corporations by federal tax laws and accounting procedures. Under these laws, the VIFPCs are "Sub-Chapter C Corporations" while

the TIMOs and REITs are “Sub-Chapter S” and “Limited Liability” corporations, respectively. The profits obtained, by the “Sub-Chapter C Corporations”, from timber sales are taxed twice, first at the corporate level (40%) and second at the stockholder level when dividends are disbursed (15%) while profits of the “Sub-Chapter S Corporations” and “Limited Liability” corporations are taxed only at the stockholder level (15%) (Block and Sample, 2001, Flynn, 2003). Similarly, under the Generally Accepted Accounting Principles (GAAP), the “Sub-Chapter C Corporations” cannot include any appreciation in the value of their timberland assets in computing return on investment which contrasts with the conventions that apply to “Sub-Chapter S” and “Limited Liability” corporations (Block and Sample, 2001, Flynn, 2003, Ravenel, Tyrrell, and Mendelsohn 2002).

The researchers, as stated above, have identified many other factors for these changes which include: (i) relatively weak financial returns from the Forestry and Paper Group (average annual return of 6.2% over the period of 1995 to 2005) as compared to 12.1% for the S&P 500, and +13.1% for the Dow Jones Industrial (Clutter et al. *4); (ii) the opportunity to “cashing in” to forest companies due to rising forestland values, especially tracts with good access, proximity to urban areas, water frontage, scenic value, or outdoor recreation potential, and their inability to recognize this appreciation in their calculation of return on investment under the GAAP (Ireland, 2005); and (iii) a way to get the debt off corporate balance sheets, the debt burdens which were increased due to substantial consolidations in the domestic industry which resulted from the increasing competitive pressure from low cost timber suppliers and forest products manufacturers in other parts of the world (Block and Sample 2001). Additional factors include: (i) the enhanced opportunities for relatively attractive forestland investments in tropical counties with higher timber productivity and less stringent environmental restrictions; (ii) the apparent decline in the domestic demand of some forest products such as paper and paperboard, and increasing use of recycled fiber; and (iii) the emergence of new tax strategies, such as installment sales, that provides flexibility to diversify the capital gains tax implications due to sale of forestlands; and (iv) change in the long held belief that ownership of timberlands was essential to ensure availability of raw material at reasonable cost.

Similar to the factors identified for these changes, many researchers have also suggested various motives for increase in forestland investments by the TIMOs and their institutional supporters. These factors include: (i) the Employee Retirement Income Security Act (ERISA) of 1974 and similar state laws that promoted diversification of institutional investment portfolios - investment in timberlands (Block and Sample, 2001); (ii) the perception of the investment community about long-term favorable returns from investment in timberland (investments averaged +20.1% per year - +7.8% of this total was due to income generated, and +12.3% was due to appreciation in value) (Block and Sample, 2001, Ravenel, Tyrrell, and Mendelsohn 2002); (iii) lower risks in timber investments due to counter nature of returns from timberland investments as compared to the returns from many other types of investments. (Block and Sample, 2001, Ravenel, Tyrrell, and Mendelsohn 2002); and (iv) inflation protection – timberland investment returns being highly correlated with the rate of inflation (Ravenel, Tyrrell, and Mendelsohn 2002).

Similar to the key motives of TIMOs, the motives of forest products companies that formed timber REITs include: (i) favorable tax treatment; (ii) fair valuation of timberlands by

financial markets; and (iii) the Real Estate Investment Trust Simplification Act (REITSA) of 1997 which allowed large institutional investors to hold shares in a REIT and removed a provision of “Thirty Percent Gross Income Test” in the previous law. The previous law restricted the formation of REIT because the VIFPCs, interested in forming a REIT, would have to forgo any timber harvesting for 4 years under the previous law (Mooney 1998).

Hence, as this discussion indicates that the main reasons behind these changes in forestland ownership in the USA are to take the maximum advantage from the existing and revised tax laws, and not necessarily to increase the economic returns by enhancing forest management practices or improving forest productivity. In fact, there is some evidence to suggest that TIMOs and REITs are more willing to convert forestlands to other uses to increase their economic returns, and typically operate in 10 to 15 years timeframe as compared to 50 years or longer timeframe of the VIFPCs, and this frequent change in ownership has resulted into increased fragmentation of forestland (Hickman, 2006). Similarly, to capture higher prices of timberland, many TIMOs have sold timberlands in smaller sizes than they were acquired (Hickman, 2006). These observations suggest that the main motive of these organizations may be just to make more money in short-run, and not to continue with timberland ownership in the long-term

3.1.2 Restitution of Forestlands in Countries in Transition

In the last decade or so, the privatization of forest resources in transition economies is the result of restitution programs, and the degree of these programs varies across the countries. For example, Bulgaria, Estonia, and Slovenia intend to restore the pre-Soviet ratio of private-to-public forests while Slovakia, Romania, Hungary, and Czech Republic intend to restore private ownership only to between half and two thirds of its original area (The World Bank, 2005). One important feature of private ownership in these countries in transition, as opposed to OECD countries, is diversity of private owners, which include religious institutions (churches), schools, municipalities, communities, and individuals. For example, in Romania, by mid 2003 only 15% of the restituted forest area went to individuals while more than half (50.3%) went to municipalities, towns, and communes. In addition, communities received about 31% and churches and schools about 3%.

Table 3: Restituted Forestland in Romania by mid 2003

Ownership	Area in Hectares		
	Claimed	Validated	Restituted
Individuals	916,036	312,370	224,378
Communities	725,857	593,048	445,306
Churches and schools	65,407	65,064	43,472
Municipalities, towns, and communes	1,280,763	795,453	720,664
Total	2,988,063	1,765,936	1,433,820

Source: The World Bank (2005)

The restitution of forest lands in these countries is definitely increasing private ownership but instead of increasing economic efficiency, it may be creating new risks to forests which need to be addressed by public institutions. For example, in Romania, about one-third of the restituted forest area (about 350,000 hectares in 1991/92) was clear felled within three years in search for immediate financial returns by poor small holders (The World Bank, 2005). Similarly, the restitution of forest lands leads to the reduced revenue of state forest administration and fragmentation of forestlands which pose new challenges to public agencies. In addition due to heavy but unenforceable regulatory framework for private forestlands, due to limited institutional capacity, the existing forest management by state agencies is replaced by either no management or poor management (The World Bank, 2005). The problem of scale economies and monopoly situation of state enterprises in timber markets further constrains the economic efficiency of private forestland owners (The World Bank, 2005). In short, increasing private ownership of forests in these countries does not mean increasing efficiency of forestland operations.

3.2 Forest Tenure leading to Forest Management by State-Owned Forest Company in Sweden

The Swedish Forest Service (Domänverket) was established in 1859, and one of the objectives of the service was to increase state owned forest land. The service purchased about 640,000 hectares of land during 1875 to 1955, and 100,000 hectares during 1970's. In 1975, Domänverket's land holdings were maximum – 4.1 million hectare – about 20% of productive forest land. In 1941, a state forest industry company (ASSI) was established as a subsidiary to Domänverket, and in 1957, the ASSI was separated from Domänverket and moved to Ministry of Industry (Asserståhl, 2006).

In 1940s and early 1950s, there was discussion about privatizing state forestry agency for decades, and in 1953, the government rejected the proposal to privatize Domänverket. However, in 1991, the parliament decided to incorporate Domänverket, and in 1992, Domänverket (responsible for forest land and operations) was corporatized, and Doman AB (100% state owned) was established with forest landholdings of 3.4 million hectares while 0.7 million hectares of forest was retained with National Property Board. The main driving forces behind this change were – change in political situation, international trends in global economics (globalization, market economy, and increasing competition), and approval by trade unions and employees. In 1993, Doman AB acquired ASSI AB (100% state owned forest company) which owned manufacturing facilities, and AssiDoman AB (100% state owned) was formed which owned forest land, operations, and manufacturing facilities. The motives behind this change were – an internationally strong company on Swedish forestry, enhanced use of virgin fibre, integrated and therefore less-dependence on business cycle, and self-sufficiency in wood. In 1994, the state reduced its position in AssiDoman to 51%.

In 1999, about 25% forestland of AssiDoman was transferred to Sveaskog AB, whose all shares (100%) were acquired by the state, and the state reduced its position in AssiDoman to 35%. The state motives behind this move were (i) to explore the possibilities of land swaps with private land owners; (ii) to setoff more areas for environmental purposes such as nature conservation and recreation; and (iii) to encourage more competition for raw material specially saw logs (Asserståhl, 2006). The motives from AssiDoman perspective were to reduce the state

ownership of the company and to divest areas of less commercial value and outside core areas (Asserståhl, 2006). In 2001, the state acquired the remaining 65% shares of AssiDoman through Sveaskog AB, or the two companies were merged and the state has 100% shares of Sveaskog. After this merger, the structure of forest ownership in Sweden became – 49% private woodlot owners, 25% private companies, 18% state, and 8% others.

Sveaskog AB, after its formation, continues to sell forestland to small private owners and buy big pieces of forest land. At present, Sveaskog owns 4.3 million hectares of land of which 3.2 million is productive forest land – that is 15% of productive forestland of Sweden. Sveaskog activities include: (i) selling and buying wood; (ii) providing forestry services; (iii) lease of land and water assets for the purposes of hunting rights, fishing rights, agriculture lease, residential lease, installation lease, land lease, and rental; (iv) establishment of wind power; and Sveaskog puts lot of emphasis on research and development. Sveaskog has three wholly owned subsidiaries.

Sveaskog Baltfor is the leading timber trade companies in Latvia. The main activities of the company involve deliveries of round wood, wood chips and fuel wood to industrial customers, primarily in Sweden. Sveaskog Baltfor has an effective network of storage and handling terminals in the Baltic countries and conducts timber handling in five Baltic ports. Svenska Skogsplantor is a leading producer of seedlings in Sweden. The company has nine nurseries, one seed unit and a network of approximately 70 supply terminals. It provides a wide range of services within the whole forest management sector. Sveaskog Naturupplevelser works to: manage leases that increase value for employers, manage game and fishing stocks, develop commercial eco-tourism in Sweden. Sveaskog Naturupplevelser has 8,500 leases for land and water throughout Sweden. The company is responsible for Swedish fishing licenses and runs the market place, Inatur. Sveaskog Naturupplevelser works with fish conservation in Sveaskog's waters and runs the game fishing facility at Mörrumsån. Setra Group is Sweden's largest wood products company. The company is also a significant player in the European market. Sveaskog owns 50% of Setra Group AB (all contents of this paragraph are from the Sveaskog's website www.sveasking.se accessed on March 20, 2009).

3.3 Commercialization, Corporatization, and Privatization of Plantations and not Forests

3.3.1 First Corporatization and Later Privatization of Plantations in New Zealand

The emergence of environmental movement, in the 1970s and early 1980s, in New Zealand resulted in the widespread dissatisfaction with the management of indigenous forest estate by New Zealand Forest Service (NZFS) (Roche 1990; Kirkland 1988), and “Maruia Declaration”, supported by 341 000 signatories in 1976, called for the splitting-up of the Forest Service and the creation of a Department of Nature Conservancy to manage publicly owned indigenous forests. On other hand, the government was putting a lot of emphasis on market oriented approach to commercial forestry (Roche 1990; Clarke 1997; Kirkland 1988; Birchfield and Grant 1993). In 1978, the Auditor-General was highly critical of the department's accounting system, and was unable to reconcile the value of forest assets under the supervision of the NZFS (Roche 1990). A Parliamentary Select Committee chaired by Ian McClean, established in response to the AG report, concluded that the NZFS's cash accounting system

(SIGMA) is satisfactory for managerial purposes but not good for commercial accounting purposes, and the valuation of forest resources is “woefully inadequate” (O’Loughlin, 2005). The McClean report and another study by the Development Finance Corporation in 1980 emphasized the disadvantages of performing the commercial and social functions by the same organizations –NZFS (O’Loughlin, 2005). A review report by a committee comprising the State Services Commission, the NZFS, the Treasury and private sector representatives supported the commercial and non-commercial roles by the same department (State Services Commission 1982), and the New Zealand Institute of Foresters vehemently defended the multiple-use management of forest resources (Roche 1990).

In 1984, when Labour Government came in power, it faced intrinsically vulnerable economy with massive debt, inflation, stagnation and a rising unemployment rate. The Treasury briefing document, prepared for the new government, criticized the government departments for the lack of defined goals, effective control mechanisms, freedom to change the way the departments are operated, and effective review mechanisms for dealing with poor performance. The Treasury also produced a briefing paper on “Economic management, land use issues” (Treasury 1984) which was critical of plantation targets, grants and subsidies for plantations, the taxation for forestry activities, and timber sales. The Treasury proposed a market-oriented approach to forestry activities and suggested that the commercial activities of the NZFS should be transferred to a separate state-owned enterprise with commercial objectives.

The new Labour Government immediately embraced market-oriented approach and introduced wide-ranging economic reforms including removal of subsidies to agriculture, forestry and industry, removal of all price, wage, income, and foreign exchange controls, and a new unfavorable tax regime to forestry. These reforms were known as “Rogernomics” in recognition of Hon. Roger Douglas, the Minister of Finance and the leading figure driving the reforms. In September 1985 the government decided to separate the commercial and non-commercial functions of the NZFS (Roche 1990; Kirkland 1988). The process took almost two years, and finally on April 1, 1987, the NZFS was dissolved, and three new organizations were created: (i) the New Zealand Forestry Corporation (NZFC) to administer state forest production and wood processing; (ii) the Ministry of Forestry to undertake the sectoral and regulatory functions of the NZFS; and (iii) the Department of Conservation responsible for administering conservation lands including indigenous forests, managing indigenous and introduced fauna, and managing public recreation.

The lands and forests, under the control of the NZFS, were divided between the New Zealand Forestry Corporation and the Department of Conservation depending on the main purpose of forest management. The NZFC was governed by a board of directors, and consisted of two subsidiaries: New Zealand Timberlands (responsible for managing and harvesting the 550, 000 hectares of plantation forests) and Prolog Industries Ltd - responsible for processing timber at its two sawmills at Waipa and Conical Hill. New Zealand Timberlands was divided into three regions and 14 districts. The shareholder of the NZFC, the government, was represented by two shareholding ministers, the Minister of Finance and the Minister of State Owned Enterprises (O’Loughlin, 2008).

The social costs of the dismantling the NZFS were extremely high (O'Loughlin, 2008), but no real estimates are available. The communities in small forestry towns were devastated and the Northland region was particularly badly affected (O'Loughlin, 2008). These changes in forest governance led to 24% decline in annual sawn timber production between 1986 and 1988 and a fall in new planting by 38% during the same period (Brown 1997). However, the corporation was financially quite successful. The NZFC, over its lifespan of 3.5 years, doubled the operating surplus per cubic meter of wood produced from about Z\$15 to about NZ\$30 (Kirkland and Berg 1997), and by the third year of operation, the NZFC had turned around a pre-corporation annual deficit of NZ\$71 million into an annual operating surplus of NZ\$63 million (Birchfield and Grant 1993). However, the NZFC was a very short-lived organization.

In 1987, on the re-election of the Labour Government, the Treasury indicated various residual problems with the State Owned Enterprises (SOEs) including the NZFC, and suggested that a full private sector approach would be superior. One of the major problems was a valuation of the Crown businesses transferred to the SOEs. The Treasury regarded the SOE valuations too low while the SOEs regarded the Treasury's valuations too high. The Minister of Finance, Hon. Roger Douglas, who firmly believed in privatization and was influenced by the privatization actions of Margaret Thatcher's government (Douglas, 1993) was easily convinced. In addition to the Treasury's assessment of the SOEs, New Zealand's gross public debt of about 75 % of the GDP and annual debt service of about NZ\$4.5 billion was among the main factors to privatize public sector. In July 1988, in his budget speech Douglas outlined the criteria for the sale of SOEs, and the government's intention to sell the state's forests.

The government appointed the NZFC as the principal sales agent, and in October 1989, the corporation issued the "Sale of State owned Forests in New Zealand" prospectus. The sale process was complicated by Treaty of Waitangi obligations, but the government reached an agreement with Maori in 1989 that enabled the Crown to sell the existing tree crops and associated assets for an immediate payment, and annual land rental payments to be placed in a trust. The main feature of the agreement was preservation of Maori rights without appreciably weakening the interest of the bidders in the sales process (Birchfield and Grant, 1993). The government agreements with Tasman Forests and Carter Holt Harvey, New Zealand's largest private forestry companies at that time, also delayed the process of sale, and this conflict was finally resolved by sale of those forests to the company (Birchfield and Grant, 1993). The sales were structured so that the buyer will buy the existing trees, buildings and other fixed assets while the land will remain under Crown's property, and could be leased to the purchaser for any legal purpose including replanting. The sale instrument was called a Crown Forestry License, and the term of the license was 35 years, a rotation period of radiata pine plantations. The term of the license could be extended by one year, each year, unless notice was given to the contrary. If the land was not liable to a Maori ownership claim, the license term would be extended by adding a further term of 35 years (Kirkland and Berg, 1997). The sale involved about 90 individual state forests, and 554,214 hectares of plantations, about 81% of radiata pine. The first sale process was finalized in November 1990, and the fixed assets and rights on 246,700 hectares of land were sold for NZ\$1.027 million (O'Loughlin, 2008).

An area of about 303, 600 hectares of state forest, mostly in central North Island, could not be sold, due to lower bids (Birchfield and Grant, 1993). Hence, a subsidiary of the NZFC -

NZ Timberlands Bay of Plenty Ltd - was established to manage unsold state forests in North and Timberlands West Coast Ltd was formed for the West Coast. In 1992, most of the remaining state forests, outside the Bay of Plenty, about 97,000 hectares, were sold to the Rayonier Incorporated for NZ\$366 million, in this sale the buyer was obligated to replant after harvesting, which was a new condition of sale. In 1996, Kaingaroa forest and the associated forests in the Bay of Plenty of about 190,000 hectare and two wood-processing plants were sold to New Zealand-based Fletcher Challenge Ltd for NZ\$2.03 billion. The sale conditions were similar as of 1991 sales. With the 1996 sale, the bulk of the formerly state-owned plantations were transferred to private ownership, but about 4 percent of the total plantations were left with the state under the administration of Crown Forestry Management Ltd, which replaced the NZFC.

On the re-election in 1987, the Labour Government set a target of NZ\$14 billion from the sale of public assets to lower the debt, and the government was quite successful - raised NZ\$12 billion by 1992 (Douglas 1993). The sale of state forests, between 1990 and 1996, contributed approximately NZ\$3.5 billion. The response of the general economy was positive after 1992. For example, economic growth was negligible during 1985 to 1992, but it rose to +5% in 1993 and +6 percent in 1994, respectively. Net public debt reduced to about 30% of GDP in 1996 from about 51% in 1992. However, this economic miracle was short-lived, and key indicators began to turn sour by the end of 1996. The forestry sector, through the 1990s, was characterized by continued growth supported by price booms in logs and solid wood products in the mid-1990s and the pulp and paper products in the late 1990s, and increased investment in wood-processing plants (Brown, 1997).

The state ownership of the trees under plantations reduced from 53% in 1987 to about 6% in 1996, and the direct foreign ownership increased from about 2% to about 18% (Gilbert, 2000). The total foreign interest in the plantations, taking into account foreign stakes in the New Zealand forestry companies, increased to about 48%. Overseas forest sector investors viewed these reforms positively (Edgar et al., 1992), but concerns about labour conditions, location (isolation) and cultural immaturity persisted. Aggregated investment in wood-processing facilities reached NZ\$300 million in 1991 and a reasonable rate of investment continued throughout the 1990s (Le Heron et al., 1996), but concerns about the lack of enough wood processing capacity to deal with increasing wood volumes continued (Rumker, 2004). The period from 1993 to 2000 was of planting boom, about 430 000 hectares were planted, mainly by non-corporate foresters and small landowners. After 2000, issues related to carbon credits, the strong New Zealand dollar, the tax regime, falling profitability of the wood export industry, and a growing perception about risks associated with forestry investments, plantation rates have fallen dramatically.

Two long-terms impacts are clear. First, the loss of a multiple-use approach to forestry is a long-term legacy of these reforms. Perley (2003) termed it as a segregated sector model, not suitable for integrated forest land-use management, and may, in the longer term, hinder the development of truly sustainable forest land-use practices. Second, a frequent change in plantation tree owners introduces an uncertainty about long-term vision of forestry.

3.3.2 Commercialization, Corporatization, and Privatization of the Public Plantation Estate in South Africa

Historically, the South African government has played a major role in the establishment of forest plantations. From the late 19th century onwards, initially in response to a policy of self-sufficiency, and later as its responsibility for the provision of public goods, regional development, and rural employment, the government established and managed a large plantation estate. In the late 1990's, South Africa has approximately 1.5 million hectares of commercial plantations (52% of pine and 39% of eucalyptus) of the total land area of 122 million hectares. The new plantations peaked in 1991 – about 45,000 hectares per year, and since 1996, it has been around 11,000 hectares per year (Mayers et al., 2001). South Africa has only about 500,000 hectares of closed canopy forests (0.3% of the geographical area), but it has 23 million hectares of woodlands (19% of the area) which are very important socially and environmentally (Mayers et al., 2001). In 2000, prior to the starting of the process of privatization, the ownership of plantations was distributed as - 30% state, 47% two large forest companies (Sappi and Mondi), 22% small private companies and big farmers, and 1% small growers (Mayers et al., 2001). The publicly owned plantations have two components - the plantations established and managed by the former RSA's Forestry Department and the plantations of the former Homelands. After the reunification of South Africa in 1994, all homelands plantations (about 155,000 hectares) were transferred to the national Department of Water Affairs and Forestry - DWAF (Dlomo and Pitcher, 2005).

There have been discussions/debates about the role of the state in forest plantations from the early 1980s, and the new forest policy in 1996 redefined the state's role in forestry sector. One of the main elements of this policy was the transfer of commercial forestry operations from the state to private sector. The 1996 forest policy emerged in the context of major changes in other sectors that were developed to realign its policies and institutions away from the inefficiencies, inequalities and distortions of the Apartheid era. The new forest policy (Government of South Africa, 1996), called for radical changes in the way forests are valued and managed. The new policy provided a clear direction and impetus to government's intention to divest its plantation resources but as mentioned above thinking about the privatization process started much earlier.

The former RSA's Forestry Department has been debating, for many years, starting in the late seventies, the merits/demerits of increased private sector participation in state owned plantations and these debates were influenced by the contemporary experience of New Zealand (Mayers et al., 2001). In 1983, the Cabinet appointed an Interdepartmental Committee to investigate the transfer of the state's plantation activities to a Corporation. Hence, even prior to the Forest Policy of 1996 and the democratic elections of 1994, a three-stage (commercialization, corporatization, and privatization) process had been envisaged for the forest assets of South Africa (Mayers et al., 2001, and Dlomo and Pitcher, 2005).

The commercialization began in 1985 with the adoption of a new 'trading account', by the Forestry Department, which introduced commercial accounting and budgeting practices. The new accounting system enabled the Department to identify timber income and production costs separately so that it can evaluate the efficiency of operations. The Department was also allowed to retain related revenue (Mayers et al. 2001).

The process of corporatization began in 1989 with then government's presentation of a draft bill on the creation of a National Forestry Corporation. Later in 1992, after consultation with different sectors, legislation was introduced to corporatize the state plantation assets. In September 1992, SAFCOL (South Africa Forest Corporation Limited) was incorporated as a public company, and in 1993, the SAFCOL and the government agreed on the process for the transfer of assets and staff. After that, the SAFCOL started commercial operations and the process necessary to sell off (either all or part) of the government's shareholding.

After 1994 elections, the discussions started about the approach to combine the privatization of plantation assets with the SAFCOL process. After deliberations for few years, in late 1998, the government formally approved a single process to privatize all its plantation assets (both those managed by SAFCOL and DWAF). The process involved a phased approach, dividing all the state's plantations into three categories:

- (i) the entire SAFCOL estate (386,476 ha) combined with those former Homelands plantations (about 70,000 hectares) that are so closely associated with particular SAFCOL assets so that it makes their combination logical;
- (ii) the balance of the commercially viable DWAF's plantations (approximately 70,000 hectares), and
- (iii) about 120 small scattered plantations, extending over 15,000 hectares, producing non-commercial material which is extensively utilized by local people.

It was decided to concentrate on the first category of assets – joint SAFCOL/ DWAF assets – first, and to complete this process before putting other assets on the market. The combined SAFCOL/DWAF assets were divided into seven 'packages', each representing a logical business unit, and a 'Special Purpose Vehicle' (SPV) was created for each package. It was decided that 25% shares in each SPV will be held by non-private agencies - government (10%), workers (9%) and the National Empowerment Fund (6%), 75% will be sold to the private sector. So, private investors were then invited to bid for a 75% shareholding (of which at least 10% needed to be black owned) in any combination or all of seven SVPs. One of the important features of these SVPs was that the ownership of the land under plantations remained with the state, and the investors were offered the use-rights only through a long-term lease. In 2001 sale, in which seven SPVs, amounting 321,826 hectares of plantations, were offered for sale, only two SPVs (total plantation area of 90,377 hectares) were sold (Dlomo and Pitcher, 2005, Table 10.1).

In fact, as stated above these were not the sales of land but leases of land. The New Zealand Crown Forest License was a template for the original lease. The lease included following (i) lease duration of minimum 70 years; (ii) payment of market-related rent to use the land and the value of standing trees is not included in the calculation of the land rent; (iii) full undisturbed possession of the land subject to the Forest Act provisions that allows public access for cultural, recreational, and spiritual purposes; (iv) license covers all activities, including silvicultural, ecotourism, hunting, and quarrying, and the lease holder may issue license to third parties for some of these activities; (v) in the event of successful land claim, the claimant receives title to

the land and the rent, but lease remains in place, however the claimant can challenge this in the court, and on the win of the claimant, the state must compensate the leaseholder for losses.

3.3.3 Commercialization, Corporatization, and Privatization of Plantations in Australia

As per the “State of Forests Report 2008” the total forest area is 149 million hectares, out of which 147 million hectares is native forest, dominated by eucalypt (79%) and acacia (7%), and 1.82 million hectares are of softwood and hardwood plantations. The decrease in forest area, from 164 million hectares reported in 2003 to 149 million hectares, is mainly due to increasing availability of high-resolution, remotely sensed data and improvements in methods for identifying forest types. During the period of five years (2003-2008), the area of plantations increased from 1.63 million hectares to 1.9 million hectares, nearly all increase was in hardwoods (mostly for pulpwood), which grew from 503,000 hectares in 2000 to 883,000 hectares in 2007. Plantations now produce two-thirds of the country's log supply. More than 21 million hectares of forests, about 13% of total forests, is indigenously-managed supported by Australia's Indigenous Forestry Strategy (SOFR, 2008). Out of 149 million hectares, closed forest is 4.3 million hectares (0.56% of land area), open forest is 44.1 million hectares (5.7%), woodland 99 million hectares (12.87%), and plantations 1.9 million hectares (0.25%). (SOFR 2008). About 108 million hectares is under crown ownerships, 38 million hectares under private ownership (including Aboriginal ownership), and for about 1.5 million hectares tenure is unresolved (Australian Government, 2007). About 70% of Australia's forests are under so called private management, with 44% on leasehold land (similar to SFLs in Canada) and another 26% on land either held under freehold private title or managed by Indigenous communities. 65.1 million hectares of forests are under leasehold, and about half of which is in Queensland. Similarly, more than 80% of private forests are in Queensland, New South Wales or the Northern Territory, which have large areas under the control of Indigenous people. 22.4 million (about 16%) hectares of forests are formally protected in public nature conservation reserves, and about 9.4 million hectares (6% of total forests) are under multiple-use public forests, where timber harvesting is generally permitted (SOFR 2008).

In early 1990s, the state governments were the major plantation owners, but the private ownership of plantations has increased from about 30% in 1990 to 46% in 1999, and to over 57% in 2005 when public ownerships is about 37% and joint ownership about 6% (Australian Government, 2007). More detailed ownership distribution of plantations is Governments (37%), Managed investment schemes (23%), Superannuation funds (12%), Timber industry companies (15%), and Farm foresters and other private owners (13%) (Australian Government, 2007).

History of forest management in Australia is similar to Canada. Australia is a federation of 6 states and 2 union territories, and the federal (Commonwealth) government has no direct power over forest management but it has exerted considerable influence over forest management and forest policy in the number of ways (Dargavel, 1995). The main responsibility of forest management rests with the states, and each state has its own legislation (Forest Act) and operations code (Forest Practices Code). State-based Forest Commissions managed state forests for production and protection functions of forests. Similar to other parts of the world, conservation movement grew in late 1960s and 1970's, and management of native forests became contentious issue. A large proportion of state forests were moved to conservation areas

in 1970's and 1980s. As a result of reduced timber production from native forests, the Commonwealth Government and state governments put lot of emphasis on expansion of plantations through tax incentive mechanisms. In addition, in 1980's, the other issues, such as the lack of economic/commercial focus and efficiency among state forest agencies, separation of management and administration responsibilities, and political interference, also gained the momentum. As a result, the Commonwealth and State governments announced a National Forest Policy Statement (NFPS) in 1992. The main feature of this policy statement was integrated management of native forests through Regional Forest Agreements (RFA), and other key features included expansion of softwood and hardwood plantations and moving to market-based pricing of forest resources. The key outcome of the NFPS was a set of ten RFAs in four states - Western Australia, Victoria, Tasmania and New South Wales – which cover about 23 million hectares of productive forests (Pollard, 2007) The RFA are 20 years agreements that try to balance environmental, social, economic, and heritage values and provide certainty for all sectors of forestry - forest-based industries, forest-dependent communities, and conservation efforts.

Similar to many other developed countries, after the recession that followed the Black Monday, October 19, 1987, when stock markets around the world crashed, the government became focused on widespread economic reforms. In fact, Paul Keating, then Federal Treasurer, and who became Prime Minister after 1991 elections, stated that Australia being in danger of becoming “Banana Republic” (Nelson and Nikolakis, 2008). The main focus of the federal policy during this period was increasing the role of market forces and reducing the role of the state. The Government announced National Competition Policy in 1995. The main features of the policy were to provide a level-playing field to the private sector by promoting efficient competition between public and private sector and separation of regulatory and commercial functions (Nelson and Nikolakis, 2008, Pollard, 2007). As result of the NFPS and the NCP, most state forest agencies structured to operate as commercial entities, called Government Trading Enterprises (GTE) or Government Business Enterprise (GBE) within the government departments. The different states made different choices. New South Wales (NSW) (Forests NSW in 1992), Tasmania (Forestry Tasmania 1994), and Western Australia (Forest Products Commission, 2000) opted for GTE and South Australia (Forestry South Australia, 2001) for corporation (Nelson and Nikolakis, 2008). Forestry Tasmania, a GTE, has state appointed Board of Directors, Forestry Plantations Queensland, another GTE, has a separate body to liaise with government, and the CEO of Forests NSW, the GTE of NSW, reports to the Director General of the Department (Nelson and Nikolakis, 2008). Queensland and Victoria started with GTE but later moved to corporation. Similarly, different states took different approaches for regulatory and policy responsibilities.

Queensland, in 1995, started with a business unit within the Department of Primary Industries, called DPI Forestry, and it was responsible for managing and marketing all commercial forest production on both native and public land. However, DPI Forestry has negative returns on assets during 2003-2006. Hence, in May 2006, Forestry Plantations Queensland (FPQ), a state owned corporation, was created for operations on plantation estate, and a new business unit in the Department of Natural Resources and Water (NRMW) called NRMW Forest Products was responsible for business activities on native forests.

Victoria, in 1993, started with a state owned corporation –Victorian plantations Corporation, and it was given rights to trees, but not land, to 114,000 ha of softwood plantations. In 1998, these plantations, only trees and not land, were sold to Hancock Timber which retained the state log supply commitment. In 1999, Forestry Victoria, an internal business unit, was created to manage commercial activities on state forests (Polard, 2007). In 2002, the Victorian Government released the “Our Forests our Future” Policy addressing many principles of the NCP and criticisms of the Australian Conservation Foundation’s Review done in 2001 (Polard, 2007). In 2004, the Victorian Government reorganised its functioning – VicForests, a newly created state corporation became responsible for commercial activities on state forests, Department of Primary Industries for commercial forest policy advice to government, and Department of Sustainability and Environment (DSE) for conservation, planning, regulations, and monitoring (Polard, 2007). The DSE provides area-based allocation to VicForests, VicForests determines timber volume and prepares Timber Release Plan (TRP) including specifications of individual coupes, and TRPs are approved by the DSE. VicForests is responsible for harvesting, hauling, transportation of timber, and regeneration of the area. VicForests started with sealed-bid auctions in 2006, and introduced on-line auctions. In three years of its operations (2005-06, 2006-07, and 2007-08), VicForests harvested 1.8, 1.6, and 1.9 million cubic meters of timber, and made a net profit(loss) after tax of \$2,085K, -\$17K, and \$538K, respectively (VicForests, 2008)

In 2001, the Australian Conservation Foundation evaluated the performance of the different states with respect to the objectives of the NCP (1995), and Nelson and Nikolakis (2008) revised that assessment on the basis of new data. As per Nelson and Nikolakis (2008) assessment, Victoria has met all four objectives – (i) separation of regulatory and policy functions from commercial functions; (ii) independent monitoring and enforcement of plans, codes, and standards; (iii) independent and transparent setting of reserve prices; and (iv) separation of native forest logging from the promotion of private plantations. Queensland has achieved the first, second, and fourth objectives; Western Australia – first and second objectives, and South Australia – fourth objective, and all these states have made progress on other objectives. NSW and Tasmania have not achieved any of these objectives but have made progress on all four objectives.

3.3.4 Corporatization of Forestry Operations in India

The National Commission on Agriculture (1976) observed that returns from forestry activities are not economically defensible and emphasized that production of industrial wood should be economically defensible in terms of cost and returns. The NCA also recommended a new organizational structure to manage these commercial activities on business principles and to attract institutional finance (GOI 1976b). In response, Forest Development Corporations were set up in almost all states; they were, however, manned by forest officers rather than business managers. Although the NCA foresaw this problem and recommended the training of forest managers in business management skills, the establishment of an institute to impart these skills took almost two decades, and when the first batch of graduates emerged there were no openings for them in the forest corporations (Kant and Berry, 2005).

Irrespective of managerial aspect, at present, almost every state has a forest corporation. These corporations can be divided in four broad categories – forest corporations, forest plantations corporations, corporations for specific forest products, such as cashew nut, rubber, tendu patta, and forest industries corporations. Generally, forest corporations are responsible for harvesting and marketing timber on behalf of the forest departments. Forest Plantation Corporations are responsible for creating and managing new plantations on state-owned forestland. Specific products corporations, such as rubber, cashew nut, tendu patta, are responsible for managing existing plantations as well as growing new plantations of these products. Forest Plantation Corporations have created between one to 2 million hectares of plantations of teak, eucalyptus, bamboo, tropical pines, casuarina and cash crops such as oil palm, rubber, cashew, tea and coffee.

In 1990, the Forest Corporations' review found that corporations' plantations were not very successful - generally their success rate was between 50 to 60% (probably due to low seedling survival rate); growth was poor, yields were low, and the quality of products was poor (GOI, 1990). Most of these plantations were incurring losses, and could not attract institutional finance (Saigal, 2005). The main reasons for the poor performance of the corporations are: (i) excessive state control leading to lack of functional autonomy; (ii) lack of corporate culture and the continuation of the forest department culture – all line positions are held by forest service officials; (iii) lack of long-term vision due to quick replacements of the persons holding the position of Managing Director; (iv) diversification into unrelated activities such education, health, and tourism activities; and (v) overstaffing (GOI, 1990)

3.4 Creation of Forest Enterprises within the State Forestry Agencies

3.4.1. Creation of a Forest Enterprise as part of the Forest Commission of the United Kingdom

By 1900, only 5% of the land was left under trees due to the centuries-long deforestation in favour of agriculture, industry, and settlement. The Forestry Commission, a state agency, was established in 1919, to promote afforestation, and the main motive behind this was national defence, and other reasons were to promote rural industry and employment at the time of economic crisis. The FC planned to meet afforestation targets by buying land for planting, and through incentives to private landowners for plantations. The FC afforestation policies, to a degree quite successful in achieving its objectives, came under increasing criticism during the 1980s, because the rate of private afforestation increased rapidly due to subsidies and non-native conifers were the dominant species in these plantations. In 1988, the government eliminated the tax incentives for plantations, and the planting grants, and started on focusing on wider range and specific types of plantations, such as small-scale wood loads, broadleaves species, community woods and recreation woods, were increased substantially (Grundy, 2005) . The FC's own afforestation program continued from 1920 to about 1990. However, afforestation by the state was discontinued on the realization that the private sector is a better manager of commercial activities, and the FC started disposing of some forests, the private sector became the main afforestation agent, The state-led partnership with the private sector succeeded in establishing over 1.5 million hectares of plantations, mainly non-native softwood species. These plantations combined with other woodlands and forests in private ownership raised the area under trees to

about 11%. The main change has been in the state-owned plantations which increased from almost nothing to nearly one million hectares. In 1980s and early 1990s, the FC's holdings were reduced to rationalize its structure in the interest of efficiency. However, the disinvestment was modest – about 10% of state-owned plantations were sold to the private sector – but this area consisted of large number of small plantations. The main argument was that a large state agency cannot manage efficiently small pieces of these plantations while a private owner, generally a neighboring landowner, can easily integrate these plantations into its existing state.

On other hand, the recreational and environmental values of state plantations have been growing and attracting the attention of general public and ENGOs. This was also an outcome of the FC's efforts to promote access, recreation and biodiversity. In addition, the ENGOs and general public also believed that the FC would be more effective in preserving biodiversity and environmental values. In order to meet these issues, the government introduced schemes to encourage private owners to provide public access and to increase the wildlife and recreational values of their plantations.

The expectation of the FC as well as Treasury was that these plantations will give a positive return. However, it was very difficult to measure the return on investments made over almost a century. In addition, multiple functions of the FC – departmental, regulatory, and promotional, further complicated the calculation of financial returns. Hence, in 1994, the government set up a review mission to examine the case of privatizing state plantations. The report of review was not published, but Grundy (2005) has summarized main features of the review, and the following discussion, in this sub-section - is based on his perspective.

The main options for the state-plantations were: (i) sale of plantations; (ii) creation of a corporation; and (iii) creation of a state agency responsible for managing these plantations to meet commercial, social, and environmental objectives.

The sale was found not to be viable option due to various and diverse reasons. First, the sale of all the plantations to one or few buyers was problematic due to scale off transactions and number (few) of bidders. Second, forest industry preferred to face a well known supplier rather than facing new and probably powerful suppliers. Third, the existing forest companies were not keen to tying-up their capital which they can use more profitably in developing their business rather than buying plantations. Fourth, it would have taken a very long time to sell 1 million hectare.

The incorporation also had many obstacles. First, as the commercial operations of the FC were mixed up with non-commercial operations such as recreational and biodiversity projects, and with regulatory, promotion, and departmental activities, it was almost impossible to evaluate the commercial viability of a stand-alone corporation. The necessary information – annual commercial accounts for three years - for a stock market valuation was not there. Third, the experience of New Zealand, Sweden, and South Africa suggested that the process of the creation of commercial forestry corporation, out of a government department, is completed in many years due to differences in accounting systems, staff structures, and organizational cultures. Fourth, the low rate of return on forestry activities also suggested that the corporation may need government subsidies indefinitely

In addition, the privatization was almost opposed by every sector – forest users, the ENGOs, private owners, as well as forest industry. There was, therefore, a large political opposition to privatization. The outcome of the review process was the creation of a new agency – Forest Enterprise (FE) – which was carved out of the FC. The FE was made responsible for the management of state-plantations without any departmental, regulatory or other functions. The FE is made answerable to the FC. The FE manages state-owned plantations as per the objectives set by the government for timber production, biodiversity, and landscape values, and efficiency and profitability. The FE can contract out its operations, such as planting, harvesting, transportation, or can employ contractors on the work it manages. The FE has no manufacturing operations, and has sold small plantations which were economically inefficient to manage.

This outcome of the review process – the establishment of FE – suggests that the state ownership and management is the preferred option for plantations or forests with important public interest aspects. The experience of the UK suggests that there can be substantial gains in efficiency and effectiveness from the restructuring of the government forest departments by separating regulation from forest management.

3.4.2 Creation of Forestry Enterprises within the State Forestry Organizations of Germany

Federal Republic of Germany has about 11 million hectares of forest covering 31% of the territory. About half of the forests (47%) are privately owned, about one-third (30%) are state forests (Bundeslaender), 4% are federal forests (Bund), and 19% are communal forests (Roering, 2004). The communal forests are mainly owned by municipalities with the average size of 900 hectares, and in many cases, revenue from forests is a substantial portion of the budget of municipalities. There are about 10,000 communal forest owners and about 1.3 million private forest owners, and more than 90% private forest owners are farmers (Roering, 2004). The average size of private forests is about 7.7 hectares but more than 1 million forest owners own less than 1 hectares of forest. More than 400,000 forest owners are members of forest management associations (5,403), and these associations are managing almost one-third forests (3.3 million hectares) of Germany (Roering, 2004). Manufacturers hardly own any forest in Germany.

The FRG, being a federal state of 16 member states (called Bundeslaender), the legislative powers are shared between the Bund (federal government) and the Bundeslaender. The federal Forest Act (1975) provides the umbrella constitutional framework for forest management, and detailed policy framework, for private and public forests, are set by the respective state.

Forestry has been an important resource in Germany's economy. After the Second World War, the owners of forest resources were in a much better situation than other people. However, with increase in wages and decline in timber prices, the economic situation of forest resources and their owners changed in the sixties. At the beginning of the seventies, most of the state forest reduced their units (Forstämter) significantly in a process of re-organization. In eighties, timber prices went up and forestry had a better time. However, nineties have been really bad. In March 1990 a big storm blew down three times the normal amount of timber harvested per year at the

end of the harvesting season and it was followed by bark beetle problem. Prices went down sharply and the costs of reforestation were immense. Profitability of forestry seemed to be blown away by this storm and the bark beetle problems which occurred after the storm.

The adverse economic situation of forestry operations revived the idea of reorganization of forest management operations in 1990s. Many other factors, such as the overall economic situation of the country, the scarcity of funds in the state budgets in general and specifically for forestry operations, general public opinion about non-flexibility and inefficiency of the state agencies, specifically with respect to business operations, demand for separation of management and administration, and support to the concept of “slim state” in other countries such as New Zealand, Australia, Great Britain, Sweden, and the United States, provided impetus to forestry reforms in Germany.

Up to this time, state forests were fully integrated into the regional (Länder) administration. The sale of state forests was not possible due to strong opposition from environmental groups and lack of political support. The second storm in late December 1999, between the Christmas and New Year, provided further impetus for these discussions of reforms. This second storm occurred just at the moment when forestry had recovered from the 1990 storm and the following bark beetle problems. In 1999 severe damages occurred in the Black Mountain Region in the South West. Hence, the 1990 storm started the process of discussions about organizational reforms and 1999 storm increased the urgency of these reforms. The outcome of these discussions was forestry reforms leading to the separation of ownership and management of state forests and the forest administration dealing with private forests.

Prior to the reforms, forests in all the states were under state administration and the organizations were called Regiebetrieb, and these organizations were responsible for all three functions – management of state forests, and forest administration and policing, and forest consulting and promotion of non-state forests. By 2006, most of the states went through some form of organizational reforms, switching to a new organizational structure – termed as Anstalten öffentlichen Rechts or Landesanstalt for the management of the state forests. Anstalten öffentlichen Rechts are similar to a business unit (forestry enterprise) within the state organizations. These are not independent legal entities, but they remain under the full control of the state government. The state budget specifies both the funding available to these organizations and the payments to be returned to the state. All people working for these organizations are the same as before. The only exception is the state of Saarland where forest management is done by a GmbH – a Limited company “Saaforst” but Saarland is very small state. The rights granted to these newly created organizations vary from state to state, in some cases, they received comprehensive rights while in others only usufruct rights.

The basic idea behind the reforms was to improve economic efficiency or at least reduce cost of operations but some other reasons include increased access to new non-timber business areas and local taxation reasons. There is no study to support the increased economic efficiency of these organizations. However, there are some operational changes. For example, before the reforms the state forest administration used to undertake all forest management functions (pre-harvest planning, inventory, harvest and hauling to customer, silviculture) by itself. After reforms, there has been a trend to contracting out these operations, particularly in harvest and

hauling. Timber supply contracts are done on short term basis, mostly running from half a year to one year, and price are fixed based on market prices. Higher valued wood is made available on the request of customers, and highest value timber, such as older oaks, through competitive bidding. There has been reduction in staffing but most of the staff in these new organizations is from the state administration. The influence from politics is pretty the same as before. There is a marginal plus in flexibility. Possibilities to camouflage costs became even better. There is no evidence that these reforms attracted more investment in forestry sector. In general, federal and state laws are very restrictive for public as well as private forests. There is no clear felling in Germany and 'close to nature' forest management is very well accepted norm. There is heavy emphasis on forest certification either by FSC or PFEC (Roering, 2004).

Note: A good portion of this section is based on personal communication with Professor Martin Moog.

3.5 Forest Tenure Reforms in Ex-Communist Countries

3.5.1 Privatization of Plantations in Chile

The forest area of Chile is about 15.6 million hectares (20.6% of Chile's territory excluding Antarctica), and its distribution is 6.0 million hectares privately owned native production forests, 2.2 million hectares privately-owned protected forests, 2.1 million hectares privately owned plantations, and 5.3 million state-owned protected forests (Morales, 2005). Hence, the total native (production and protection) forests are about 13.5 million hectares and plantations are 2.1 million hectares. About 7.5 million hectares of native forest is almost inaccessible, and only about 6 million hectares is of commercial nature. In plantations, about 1.6 million hectares are of Radiata pine and 0.4 million hectares of eucalyptus.

In 1930, most of wood came from native forests, and more than 2.5 million hectares of native forest was cleared between 1920 and 1930. Hence, the socialist government of Aguirre Cerda passed the first Forestry Law (No.4363) in 1931 and created the state-owned development agency - CORFO – Corporacion de Fomento de la Produccion. The law protected native forests and provided incentives for plantations by exempting landowners from land and inheritance taxes. According to this law, plantations on declared forest lands will be tax exempt for a period of 30 years, and this provision is still in effect with respect to plantations established before 1974. In 1940, the CORFO initiated a vast private plantation program supported by subsidized loans. The annual plantation rate reached around 50,000 hectares in 1949, in 1960s, the rate of plantation declined due to political uncertainty and land reforms. However, up to 1970, all plantations were done by private agencies/farmers. Only in 1970, the state got involved in plantations, and the state plantations grew to 365,729 hectares by 1985.

Until 1960, all land was privately owned, but in 1960 and 1973, Chile experienced several waves of land reforms. The government expropriated land and handed over to landless people or turned into giant farm businesses – similarly to Soviet-style farms, and many other reforms, such as increase in agricultural wages, family allowance to farmers – were introduced during 1960 to 1970 by the Christian Democrat government. In early 1970s, Salvador Allende continued the expropriation of land, and created the state funded Reforestation Corporation

(COREF) that started afforestation on expropriated land that belonged to cooperatives. In 1972, Reforestation Corporation (COREF) was transformed into the National Forestry Corporation (CONAF) with a wider mandate at national level. The CONAF started a new plantation program – Reforestation Agreements – with the owners of new land property which he received under agrarian reforms. The CONAF provided the resources for planting, the owner managed the crop, and profits were distributed among the two.

In 1973, Chile faced the coup and Salvador Allende's socialist government was replaced by the new rightist Junta headed by the dictator General Pinochet. The Junta promised to keep government out of businesses. The Junta government introduced counter-agrarian land reforms and land was allocated to the people with technical skills and access to capital. In 1974, they passed Forestry Development Law (DL701), a corner stone of Chile's plantation policy, with an emphasis on private plantations supported by huge state subsidies. The key incentives for plantations are: (i) access to planting and management subsidies for small property owners for plantations on land classified as preferentially suitable for forestry; (ii) exemption from the land tax until two years after the first rotation, and (iii) income tax benefits on the profits from plantations. In 1977, the government passed another law – Decree Law 600 which promoted foreign investment in the country, and it attracted many multi-national forest companies.

The state plantation continued from 1973 to 1978, but it was almost reduced to no plantation from 1979 to 1982. During the deep economic recession, during 1983 to 1985, the government started new plantation program, through municipalities to provide local jobs. However, after the recession, CONAF stopped afforestation and sold all its existing plantations (about 365,000 hectares) to either to the landowners or to big companies. The private sector afforestation rates grew after recession and peaked in 1992, around 130,000 hectares per year. At the end of 2000, the total plantation area is 2.7 million hectares. The new plantations are developed on degraded forest land or barren land and not by replacing native forests. The government subsidies do not apply to previously forested lands in order to deter farmers to convert forested lands into plantations. In fact, millions of hectares of degraded agricultural and forest lands are still available for plantations.

After 27 years of the dictatorship, Chile regained democracy. Despite the many changes in leadership in democratic Chile, there is general agreement on basic government policy. The DL701 is still the cornerstone of plantation policy, and Eduardo Frei's government extended the government incentives for plantations to small forest owners and those in remote or fragile areas.

Note: Most of the discussion about Chile is based on Morales (2005).

3.5.2. Forest Tenure Reforms in Transition Economies

One of the main features of tenure reforms in these countries, specifically Estonia, Hungary, Latvia, Lithuania, Poland, and Romania, has been the separation between commercial and regulatory forestry functions. In the three Baltic states - Estonia, Latvia, and Lithuania - policy formulation and field implementation has been also separated. A comparative analysis of the nature of organizations responsible for forest related policy, legislation, and management activities in the selected countries of this region is presented in Table 4. As it is evident from the

table, Croatia, Latvia, Slovakia, and Romania have heavy involvement of state enterprises in forest management activities, but still there is lot of diversity among these countries. For example, forest management planning is done by state enterprise in Croatia, by department in Latvia, by forest research institution and private agency in Romania, and by state enterprise and private agency in Slovakia.

The outcomes of the separation of commercial functions from regulatory functions have been mixed. For example, in the case of Latvia state forest enterprise, the turnover increased by 40% and profit tripled in the 2nd year of its operation while in Estonia, the state forest enterprise doubled its turnover and triples its investment in a period of five years (The World Bank, 2005). However, in Poland, the state forest enterprise has been in difficult financial situation and has not been able to achieve financial returns similar to other state agencies (The World Bank, 2005). These financial measure of success are quite narrow, but even these results may reflect the impacts of wider economic liberalization and not only of forestry reforms. For example, timber markets in Latvia and Estonia have expanded immensely in the last five years, and the state forester enterprises were well placed to take the advantage of these markets (The World Bank, 2005).

In addition, the commercial objectives of state enterprises pose new challenges to regulatory institutions. First, high-grading of timber harvesting, which is an obvious choice by profit-seeking commercial organization, is a big risk for long-term forest health and sustainable forest management. Second, separation of these functions and some times overlapping jurisdictions of different agencies lead to regular conflicts between state agencies, and that result into economic inefficiencies. Third, the challenges and therefore the performance of the newly created state enterprises depend on social, economic, and legal environment of the country. For example, the challenge of a state enterprise in highly competitive economies - where only small forest area is managed by a state enterprise and large forest area is managed by private enterprises – is quite different than the challenges of state enterprise in a country where large forest area is under state control and competition is limited. Hence, the separation of regulatory and commercial functions is a complex process, and for the efficient outcomes, the management of this process is as difficult and challenging as the management of any other organization.

Table 4: Organizations Responsible for Forest Related Activities in Selected Countries

Function	Bulgaria	Croatia	Latvia	Romania	Slovakia
Regulatory (Policy & Legislation)					
Policy Setting	M	M	M	M	M
Legislation & Regulation	M	M	D	M, S	M
Legal Enforcement	D	D, O	D	M, S, O	D
Forest Management					
Management Planning	D	S	D	R, P	S, P
Fire and Pest Management	D	D, O	D	S	S
Inventory	D	S	D	S	S, P
Road Construction & Maintenance	D	S	S	M, S	S
Regeneration	D	S	S	S	S
Management for Recreation	D, O	S	S	S	S

Management for Conservation	D, O	B	B	S, B, C	B
Management for Environmental Services – watershed protection	D	S	S	S	S
Other services					
Sale of timber from state forests	D	S	S	S	S
Sale of non-timber from state forests	D	S	S	S	S
Extension services to private owners	N	N	P	D, S	N

Notes:

B: Department responsible for biodiversity conservation

C: Partly delegated to communities or private users

D: Department – General Directorate, Commission, or Board, usually in a Ministry

M: Ministry responsible for forestry

N: Service is not effectively provided

O: Other institution

P: Private sector either directly or delegated by state institution

R: Forest Research Institution

S: State enterprise which operate with broadly commercial objectives

Source: *The World Bank 2005*

3.5.3 Diversity of Forest Tenure Arrangements in China

Prior to October 1949, when the Chinese Communist Party (CCP) came to power and founded the People’s Republic of China, the dominant forest tenure was private forests, and most of these were owned by wealthy families, including landlords, and rich peasants. There were two other categories of forests – state-owned forests and common forests owned by social groups, villages, religious groups, and schools. In 1956, the establishment of advanced cooperatives started the end of private forests, and during the period of 1956 to early 1970s, before China started market-based reforms, forest tenures went through numerous rounds of reforms, and the end of collectivization period, two dominant categories of forests were collective forests and state-owned forests.

In March 1981, the Central Government issued a document, known as Forest Policy, which started the period of modern reforms in China’s forest sector, reforms similar to the agricultural sector started in the late 1970s. At present there are two types of forests in China – state forests and collective forests. The State forests are owned and managed by the state agencies, while the forest tenures of collective forests, can be grouped into three categories: (i) House-hold based management; (ii) Collective management, and (iii) Self-initiated shareholding systems.

(i) House-hold based management systems: Similar to agriculture, the introduction of house-hold based management systems was the main feature of 1981 forest policy. Under this system, three forest tenure arrangements have emerged.

(a) Family Plots: The first component of this system was Family Plots. Under this system, collective wastelands and degraded forestlands were distributed to rural households as family plots. The concept of family plots was first tried in the early 1960s in some province, and some provinces, such as Yunnan and Shaanxi, revived the same policy in the late 1970s, in the context of the agricultural reform. However, its full implementation was only after 1981 reforms in the forestry sector. By the end of 1984, when this component of forest reforms came to an end, at the national level, about 31 million hectares were distributed to 57 million households (MOF 1987). The main objective of the family plots program was to encourage farmers to plant trees for their fuelwood and timber requirements. The land under family plots is still owned by the collective but trees planted by farmers on these plots are private and inheritable. Households are not allowed to plant food crops but they have a right to select tree species. Households also have rights to dispose forest products, full right on benefit stream from the disposal of forest products, and the right to transfer use rights (this right was provided by the revised Forest Law of China, 1998) (Dachang, 2001). However, the village collectives, being the owners of land, can take back the land under family plots from households if they do not follow the stipulated requirements such as plantation of trees.

(b) Forest Production Responsibility System and Responsibility Hills

The success of household-responsibility system in agriculture sector, started in some provinces as early as late sixties or early seventies and formalized in 1977, led many farmers to demand the similar system in the forestry sector. In June 1983, forest production responsibility system was started formally. The main purpose of FPRS was to improve the management of existing collective forests. In the first stage, non-timber plantations, fuelwood forests, and small patches of timber forests, that were considered unsuitable for collective management, were distributed to households for management, but the collective retained the ownership and the rights related to harvesting and product sales (MOA 1984). The households share benefits from responsibility hills with the collective, and the terms of benefit sharing vary significantly among collectives. There are many other variations in the rules related to HPRS among provinces and counties in the same provinces. With the time, three different patterns of the HPRS have evolved. First, in many areas, responsibility hills have been incorporated into family plots. Second, in some areas, the short duration of rights granted to farmers and uncertainty associated with frequent reforms in forest land tenures resulted into large-scale deforestation and lack of investment by farmers in these lands. In such cases, collectives took back these lands from farmers, and decided to restore collective management. Third, in many areas, the local governments started social experiments related to different attributes, such as the term of tenure, proportion of benefit sharing, provision of services etc., of forest tenures related to HPRS, and kept modifying their tenures accordingly.

(c) Contract or Lease by Individual People of Collective Wastelands and Degraded Lands:

After allocation of land under family plots and responsibility hill system, in many areas, specifically mountainous areas, there were still wasteland resources available. In addition, in some areas, new degraded lands appeared as a result of deforestation and illegal logging in areas allocated under responsibility hills system. The collectives decided to contract out these lands to individual peoples to green the countryside and increase the role of trees and forests in rural development. The main focus of these contracts was efficiency while the focus of family plots and responsibility hill system was equity cum efficiency. Hence, there were some differences in

property right arrangements for these lands as compared to family plots and responsibility hills. The ownership of the land remains with the collective, and use rights, including ownership of trees planted on the land, to land are contracted to individual people. In this case, contractors pay for use rights to land while in family plots they get free of charge. The contracts are given to individuals who pay more rent, and these individuals can be from the same community or from outside community, but preference is given to the members from the community. There are no limits on the land area which can be allocated to an individual contractor while under the other systems equity is maintained in the allocation of land area. The mechanism to allocate lands under this program also varies from county to county.

(ii) Collective Forests: These are forests owned and managed by the village collectives. These forests are managed in the form of shareholding system, a system similar to the management system during the collective era, prior to 1970's reforms. Under this system, forest land or forest resources are not distributed to household, but monetary shares are distributed equally among villagers. On the availability or annually, the dividends from returns from forests are divided among the villagers as shareholders (Fangming and Qian (1997)). However, under this system, farmers have limited decision-making authority over forest management, product use, and income distribution (Hong and Pingkang 1997), and this system has been merely a continuation of former collective management system (Qian et al. 1997).

(iii) Self-Initiated Shareholding Systems: In many areas of China, many people and institutions have provided leadership to start self-initiated shareholding systems for forest management. Even though the exact form of these systems varies across county but the basic features are same. The shares of each member are in proportion to their inputs, and inputs are use rights to forest land, land ownership, labor, capital, technology, and other services. Generally, participation is voluntary, type of partners and the level of participation varies from county to county, and land and labor are provided by local partners while capital and technical inputs outsiders. The most common forms of these shareholding systems are: farmer-farmer, company-community, and outside individual(s) and community/household partnerships.

In the farmer-farmer systems, farmers pool their lands, forests, labor, and capital, and their shares are based on the quality and quantity of resources - land, labor, and capital – they contribute. Under these systems, farmers manage their resources themselves, and their full participation is ensured. This system is quite common in Anhui, Fujian, and Guizhou province (Qian et al. 1997). In Company-community partnerships, external institution, usually government forestry institutions, such as forest bureaus and state-owned forest companies, contribute capital and technologies and rural communities contribute lands and labor. These partnerships are common in Anhui, Fujian, Guizhou, and Yunnan (Qian et al. 1997). In fact, a World Bank's reforestation project is being implemented under such arrangement in Luoping County, Yunnan, where partners are County Forestry Bureau and local rural communities. In this project, the rural communities provide the land for plantation and communities' members work as paid workers. In the case of Chinese fir plantation, from the first crop, the bureau will get 60% and the villages 40% of profit, and from the second crop, the villages will get 100% profit. In the case of pine plantations, which will have only one crop, the bureau will get 40% and villages 60%. (Dachang, 2001)

3.6 Forest Concessions to Private Companies on Public Forests in Amazon Region of Brazil

In the Brazilian forestry sector, four developments between 1997 and 2006 - the National Forest Program (PNF), the National Conservation Area System (SNUC), the provision of fiscal incentives for natural forest management, and the Public Forest Management Law (PFML) – are termed as the signals of transition of forest management towards sustainable forest management (Banerjee et al. 2009). In 1997, the federal government, with the support of the FAO, developed the Positive Agenda for the Forestry Sector, and this agenda is the first policy instrument which moves forest management towards forest-based sustainable development, significantly different from previous policy instruments more focused on the biocentric and protectionist view. The PNF and the Secretariat for Biodiversity and Forests were created as a result of this agenda. The main objectives of the PNF are: (i) increase Brazil's share of international timber markets from 4 to 10% by 2010; (ii) create 50 million hectares of sustainable production forests on public land; and (iii) and increase exports from natural forests from 5 to 30% by 2010 (Macqueen et al., 2003, p. vi; Viana, 2004, p. 24). The SNUC was approved in 2000, and its mandate is to protect biodiversity while promoting sustainable development (Viana, 2004, p. 23) while protected areas have resource conservation as the dominant goal. The concept of financial incentives for promoting natural forest management is new to Brazil (Verissimo, 2006, p. 6), and funding for this will come from Constitutional Funds for Regional Financing established by the 1988 Constitution, such as the Northern Financing Fund (FNO), the Central-West Financing Fund (FCO) and the Northeastern Financing Fund (FNE) (Banerjee et al. 2009). Under this program, the individuals will have access for credit for forest investments with below market interest rates and the long maturation periods (Verissimo, 2006, p. 20). However, the program has not been very successful due to land claims and lack of scientific management plans (Verissimo, 2006, p.26).

The key policy instrument with respect to opening up of the Amazon for industrial development is the Public Forest Management Law passed in 2006. The law provides comprehensive details for instituting forest management by private agents on public land. The law creates the Brazilian Forest Service and the National Fund for Forest Development, and mandates the establishment of national, state and municipal forests. Forest concessions are the law's principal tools for promoting sustainable development through natural forest sector. The law defines a forest concession as the government's entrustment, through a competitive bidding process, to a legal private entity the right to practice sustainable forest management on public forest land (Banerjee et al. 2009). Only Brazilian associations of local, cooperative communities, and companies, and not international companies, can participate in the competitive bidding process. The economic activities that can be performed under these concessions include timber harvesting, trees with more than 50 cm of diameter, collection of non-timber products (ornamental oils, fruits, resins, plants, medicinal plants, etc.), collection of residual material (from the exploration process), and tourism (including lodging, sightseeing, sports). The forest concession holders will not have the rights to own the title of the land, commercialization of carbon credits, use of hydrological resources, exploration of genetic resources, mineral resources, and fisheries and fauna. The concession can be given for up to 40 years. The evaluation of proposals/bids is based on technical proposal and price proposal. The technical proposal is evaluated on the following criteria: lower environmental impact, higher social benefits, higher efficiency, and higher aggregate value to the forest product in the region in

which the concession was given. The price proposal is evaluated on the value that the concessionaire is willing to pay the government to explore the forest. The government divides all species into number of groups based on their economic importance, and sets minimum price for every group of species. The bidder offers a price (R\$/cu meter) for each group of species and this offer has to be higher than the price set by the government for each species group. The bidder also offers a total annual price for the lot on sale – based on the estimated volume of each group of species and the offered price by the bidder for the respective group of species (Lot Price = sum (volume of each group x price of each group). In the evaluation process, the price component is evaluated by the formula - (Price offered for the lot – minimum price for the lot as per the government set prices)/ (Maximum price of the lot offered in the bidding process – minimum price of the lot as per government set prices). The successful bidder pays annually a minimum of 30% of the prices offered irrespective of the volume harvested. In the subsequent years, the prices are calculated by using a price index set by the Brazilian Forest Service. In addition, the successful concessionaire pays 70% of the value of NTFP established by the respective province and R\$7/ton for the commercial residual of wood.

The forest activities will be monitored by the DETEX, which is a detection system of harvesting operations through the use of satellite identifying areas that are harvested, by the chain of custody in which the concessionaire must keep the control of the origin of forest product until the processing stage, and by the use of satellite to track the trucks containing the harvested material. Ibama is responsible to check if the Sustainable Forest Management Plan is being executed. The Brazilian Forest Service is responsible to follow the concession contract. Moreover, an independent audit should be carried at least every three years and should be done by an entity recognized by INMETRO (National Metric Institute)

The concession units can be of three sizes - a small unit (up to 20,000 ha), a median size unit (up to 40,000 ha) and a larger unit (bigger than 40,000 ha). In 2007, three forest management units (FMUs) (17,079 ha, 33,050 ha, and 46,307 ha) were offered as concessions in the National Forest of Jamari. Fourteen companies competed for this concession (6 individually, two consortiums of 5 and 3 companies, respectively). The companies/bidder can compete for many management units but can only have the concession for one.

The revenue received through these sales is distributed among different agencies. In the case of National Forests, 30% of the total revenue (the minimum which a successful concessionaire has to pay) goes to the Brazilian Forest Service, and the remaining 70% is distributed among Chico Mendes Institute (40%), the province (20%), municipalities (20%) and the National Fund (20%). In the case of outside of National Forests, 30% of the total revenue is distributed between the Brazilian Forest Service (70%) and IBAMA (30%), and the remaining 70% is distributed between the province (30%), municipalities (30%) and the National Fund (40%).

3.7 Community-oriented Forest Tenures

3.7.1 Joint Forest Management in India

As in many other countries, the historical development of the forest management has been strongly influenced by British traditions. British rulers transformed the indigenous decentralized forest management systems of India into a centralized system, and in 1865 created an agency — the Forest Department (FD) — to meet their timber and revenue demands. The bureaucratic structure of the FD, with its hierarchical practices, though non-responsive to societal needs, was in line with the colonial government's requirements. Independent India inherited this organizational structure, which “remained captive to the self-inflicted whittling process set in motion by the ambiguous treatment of customary rights and privileges during the colonial period” (Sivaramakrishnan 1995). The new Indian government followed the same path the British had: bringing more and more forests under state control and extending state control to include the power to regulate the collection of forest products in village forests and to prescribe their management practices (Alcorn and Molnar 1996). In 1952, the new national forest policy did make some deviations from the colonial forest policy of 1894, but these deviations were limited only to management techniques of the forests, and the structure and culture of the organization itself were left intact. The centralized and exclusionary management system resulted in growing hostility between local communities and the FD.

As a result, independent India's second forest policy (Government of India 1988) recognized the role of local people in management of forests by asking forest-dependent communities, for the first time, to become partners in forest management with the FD. The Government of India indicated its seriousness about this change in 1990 by issuing detailed guidelines to all states. These guidelines provided broad outlines of mechanism for developing collaborative arrangements between state FDs and village communities. As per these guidelines, ownership of the forest land was to remain with the FD; however, a committee—Village Forest Committee—consisting of FD personnel, village community representatives, and voluntary agencies, was to be constituted to make decisions on all forest planning and management related issues. In addition, the guidelines also mention sharing of forest products between the FD and the local community. All state governments used these guidelines to issue state specific guidelines, which are similar in nature but specific in terms of forest categories, forest produce, and identification of communities. Hence, the main objectives of this program, commonly known as Joint Forest Management (JFM), are: (i) motivation of the local people to identify themselves with forests, (ii) sharing of power and management responsibilities with local communities, (iii) protection and development of forests, and (iv) supply of forest products to meet local requirements, and economic development of local communities.

JFM program spread country wide very quickly, and by 2002, about 14 million hectares (18%) of state forestland was under JFM which was being managed by about 64,000 village committees (Saigal, 2005). The area under JFM increased to almost 17 million hectares by 2008. The main positive impacts of JFM include improvement in the condition of forests, increase in income of local forest dependent people, and the change in attitudes of local communities and forest officials towards each other (Government of India, 2002). However, the program has many limitations too such as heavy dependence on donor funds, no security of tenure to communities, restrictions on the sale of many non-timber forest products, and the over-arching powers of the state forest departments in terms of the provisions of the program. (Saigal, 2005).

3.7.2. Community Management in Nepal

In 1942, the Department of Forests was established for scientific management of state-owned forests of Nepal. Similar to other countries, the focus of the FD remained on managing by excluding local people from forests for almost three decades. However, this approach was not very successful due to heavy dependence of local people on forest resources. Hence, the first time, the National Forest Plan, 1976, made a commitment to initiate people's participation in forest management and handing over a part of forests to local political units or village councils called Panchayats. The Panchayat Forest and Panchayat Protected Forest Rules, 1978, initiated the process of implementation of community forestry program in Nepal. Under these rules, forest lands without trees were handed over to panchayats as "Panchayat forest" and with trees as "Panchayat protected forests.", and village councils were made responsible for planting, management, protection, and maintenance of forests. However, due to lack of direct involvement of people (forests were handed over to local political units), lack of incentives to village leaders for better management, and poor quality of forests handed over, these provisions were not very successful.

In 1989, therefore, the Master Plan for the Forestry Sector (MPFS), providing a 25-year policy and planning framework, shifted the focus, and proposed the provisions for handing over all the accessible hill forests of Nepal to user groups (not to the Panchayats), giving priority to supply forest products for those who depend on them, and involving women and the poor in the management of community forests. These recommendations, specifically related to community forestry, of the Master Plan were incorporated in the Forest Act (1993) and Forest Rules (1995). The act and the rules gave substantial rights to local people with respect to in managing community forests. The main features of this legislative framework were institutionalization of Community Forestry User Groups (CFUG) as an independent and self-governing entity, providing utilization and management rights to the local community, and creating an accountability forum for community development (Kanel, Poudyal, & Baral, 2005). The act also limited the role of the district forest office to that of supporter, facilitator, and monitor of community forestry, but at the same time it is the right of forest management and use that is transferred to the user groups and not the ownership of land itself. Members of households living near a particular forest area are members of a CFUG, and an Executive Committee, comprising of 11 members either elected or selected by members, runs the operations of the user group. The CFUG members are allocated forest products for their internal use at a price fixed by the groups themselves, and the surplus forest products are sold to outsiders at market prices. The revenue from the sale of forest products and any other source is deposited to a group fund which is used for forest management and community development activities (Kanel, Poudyal, & Baral, 2005).

In 2000, due to ecological importance of Terai forests, new Forest policy (2000) withdrew some of the rights of local forest users in Terai area. The provisions of Forest Policy included that: (i) the large patch of forests in blocks in the Terai and Inner Terai will not be handed over to local communities as community forests; (ii) these forests will be managed by the collaborative solidarity of local users, local political bodies and the government; (iii) the collaborative solidarity of users and the local political bodies will get 25% of the income from the sale of surplus forest products, and 75% of the income will go to the government. The new

policy has created some antagonism between the Terai users and the government (Kanel, Poudyal, & Baral, 2005).

Up to 2005, about 1.2 million hectares (about 25% of forest land) have been handed over to more than 14,000 CFUGs which include about 1.6 million households (35% of the country's population (Kanel, Poudyal, & Baral, 2005). The main achievements of this program are better forest conditions, income generation for rural development, social mobilization, institutional building at the grass roots level, and local level capacity building (Kanel and Niraula 2004). However, there are many new issues which need to be resolved. These issues include selling of surplus products from community forests, community-level value addition, use of community forests for income generation and poverty alleviation, and better fund utilization by the user groups (Kanel, Poudyal, & Baral, 2005).

3.8 Key Features of the Dynamics of Global Forest Tenures

On the basis of details presented in this section, we can draw many inferences related to changes in land ownership of forestland, forest management by state owned forest companies, privatization of plantations, corporatization of forestry activities, creation of state enterprises within the state forestry agency, and other reforms.

3.8.1 Change in ownership of forestland

The change in ownership of forestland has been mainly concentrated in the USA and economies in transition. In the United Kingdom and Chile, some plantations were sold, but the extent of these sales in the UK was minimal, and in Chile about 365,000 hectares were sold to private landowners and some companies. The key features of change in forestland ownership are discussed next.

1. The change in forestland ownership in the USA is mainly driven by the federal tax laws and accounting procedures. These laws lead to increased economic returns to the TIMOs and REITs simply by a change in landownership as compared to private forest companies. The better economic performance of these organizations does not mean that there is an improved economic efficiency from their forest management operations. In fact, there are indications that in some cases better economic returns may be due to a change in land use and fragmentation of forestland after the change in landownership.
2. The timeframe of these organizations is only about 15 years, which not only leads to forest fragmentation, but it shows that these organizations are aware that there are no long-term high economic returns from forest management operations. In the short-term, these organizations, specifically TIMO's, may be making higher financial returns as compared to forest companies, not only due to advantageous tax laws but also due to peoples' investments in these organizations, in the hope of high returns – leading to high prices of their stocks which results into high returns. However, once these organizations' forest-land conversion and purely money making activities, which usually come at the cost of forest health, are under the strict scrutiny of public and environmental organizations, the public faith in these organizations may be tarnished which will lead to

a fall in stock prices and reduced economic returns. This argument is supported by the short time horizon (15 years) of these organizations. There is a high possibility that the image of TIMO's may become like that of multi-nationals in developing countries, and in financial return terms investors may lose money in long-term.

3. A very interesting feature of the change in forestland ownership in the USA is that a large proportion of forestland (about 10 million acres) has been sold to environmental groups such as the Nature Conservancy. Hence, most likely a good amount of forestland which was under intensive timber management is moving towards non-timber use of forests.
4. In economies in transition, the main objective of change in forestland ownership is the restitution of forest ownership to pre-communist era. The idea of restitution either has no relevance to Canada or if any group deems its relevance to Canada, it will be restitution to pre-colonization period, which means full recognition of Aboriginal and Treaty Rights.
5. Restitution results in forest ownership by individual households, religious and educational institutions, local governments, community organizations, and communes, and not forestland ownership by forest companies. In addition, private ownership has resulted in new problems and not necessarily increased economic efficiency.
6. Chile provides a good example of transfer of forest landownership from the state to private agencies. However, several points need to be noted. First, this was the ownership of plantations and not natural forests. Second, this land was transferred to both – private landowners and forest industry, and the actual distribution among these two groups is not known. Third, the productivity of these plantations ranges from 18cumt/hectare/year to 35 cumt/hectare/year while the average productivity of the Canadian forests is between 2 and 3cumt/ha/year.

3.8.2 Forest Management by State-owned Forest Company

Sveaskog AB of Sweden, a fully state-owned company, owns about 4.3 million hectares of land out of which 3.2 million hectares are of productive forestland (about 15% productive forestland of Sweden). The company manages its forests for multiple functions, and is involved in activities related to selling and buying wood, provision of seedlings and other forest management services, lease of land and water assets for the purposes of hunting rights and fishing rights, and establishment of wind power. The company also owns 50% shares in the Setra Group AB whose ROCE in 2007 was the highest (25.2%), and it operates in a highly competitive environment where all other forest companies are under private ownership. Sveaskog AB is an excellent example that demonstrates ownership of the forest or business is immaterial – government owned companies can run as well as private companies.

3.8.3 Privatization of Plantations and not Forests

The advocates of forest privatization, in Canada, generally refer to the cases of change in forest tenures in New Zealand and Australia, and some times they also call it privatization of forests in these countries. In reality, the experience of forest tenure reforms in these two countries, and in

South Africa which followed a similar path as of New Zealand, provide very good evidence against privatization of natural forests. The key features and experiences are summarized next.

1. In all three countries, these reforms were related to plantations and not natural forests, and only the ownership of existing trees was sold and not the ownership of land under the plantations. Hence, none of these cases are related to privatization of forests.
2. The total plantation areas involved in each country in these reforms have been in the range of 100,000 to 500,000 hectares, and even for such a small area, it was not easy to find buyers.

For example, the New Zealand Forest Corporation offered 554,214 hectares of plantations for the sale of trees assets in its first sale in 1989. The sale of tree assets of only 246,700 hectares of land was finalized during the first sale, which was completed in November 1990. The sale on the remaining land could not be finalized due to lower bids. The NZFC created two subsidiaries to manage unsold land, and it took almost six more years to sell the tree assets on the major portion of remaining land. These sales were conducted through bilateral negotiations and not through auctions due to the lack of interested parties. Hence, the price received during these sales is quite debatable. Even in the end, about 4 percent of the total plantations marked for sale were left with the state under the administration of the Crown Forestry Management Ltd, which replaced the NZFC.

Similarly, in South Africa in its first sale of 2001, seven Special Purpose Vehicles (SPVs), amounting to 321,826 hectares of plantations, were offered for sale. Only two SPVs (total plantation area of 90,377 hectares) – only tree ownership and not land ownership - were sold due to a lack of interested buyers. In addition, only a 75% share of the ownership was offered in the market, while a 25% share was retained for different agencies. There is no information about the remaining plantation area.

In Australia, only Victoria went ahead with the sale of plantations. In 1998, 114,000 ha of softwood plantations, only trees and not land, were sold to Hancock Timber which retained the state log supply commitment.

3. The UK decided against the sale of plantations, and the reasons attributed to their decision are quite relevant to other jurisdictions. First, the sale of all the plantations to one or few buyers was problematic due to the scale of the transactions and the limited number of bidders. Second, the forest industry preferred to face a well known supplier rather than face new and probably powerful suppliers – creating a situation of monopoly or oligopoly.. Third, the existing forest companies were not keen to tying-up their capital which they can use more profitably in developing their business rather than buying plantations. Fourth, it would have taken a very long time to sell 1 million hectares of plantations.
4. In New Zealand, forestry reforms were part of privatization reforms in all other sectors, and a nationwide drive to raise public revenue through the sale of public assets to lower

the debt. Hence, the economic efficiency of plantations' management and recovery of the best value of plantations might have become secondary while revenue generation was the primary objective. The government was quite successful in its primary objective – sale of plantations contributed NZ\$3.5 billion in the total revenue from the sale of public assets of NZ\$12 billion. In fact, both in New Zealand and Australia, the agenda of privatization was driven by economic recession.

5. All these privatization sales efforts were for plantations, and specifically for Radiata pine and eucalyptus. Both species are fast-growing with mean annual increments in these three countries are in the range of 15 cumt/hectare/year to 25cunt/hectare/year while the mean annual increment of Canadian forests is about 2.5 cumt/hectare/year.
6. One of the key issues related to privatization of plantations or forests is the valuation of assets to be sold in the market. The valuation of plantations, which are mainly raised for timber purposes, is difficult while the valuation of forests is highly complex due to the large number of associated ecosystem goods and services, many of which are public goods. In addition, the choice of discount rate, specifically in the context of public goods and many lifesaving services, adds another complexity. Privatization, without proper valuation of forest assets will result in dissipation of public assets, and not in economic efficiency of forest management.
7. Even if we assume that the world's best economic minds will be able to correctly value forest resources, which is almost impossible, why would a private agency be willing to pay for public goods while the agency knows that it cannot charge for these goods and services due to their public goods nature?
8. Another key issue related to privatization of the Canadian forests is – will it be an economically sound decision by a private investor to buy Canadian forests? Gray (2003) estimated the value growth in the Boreal forest in the range of 2 to 5% per year (5% is on the higher side, our estimate is in the range of 2 to 3%). The question is why some one will buy the Canadian Boreal forest, rather than buying plantations in tropical countries like Chile, Brazil, and Argentina where returns from plantations will be at least 4 or 5 times higher than returns in Boreal forests?

3.8.4 Corporatization of Forest Management Activities

Many countries have forest corporations in operation. It seems that India was the first country to establish forest corporations. However, the main focus of forest corporations in India was plantations and cash crops like rubber, tea, coffee, and tendu patta. India also corporatized timber logging and sale activities in some states. However, the economic performance of forest corporations, specifically focused on timber harvesting and plantations, has not been very encouraging.

New Zealand and South Africa had corporations focused on plantation assets as an intermediate step to privatization. Chile also has a corporation for plantations. In Australia, South Australia, Queensland and Victoria have corporations focused on commercial activities of

forests. We do not have data to make conclusive comments on the economic performance of these corporations. The New Zealand Forest Corporation, over its lifespan of 3.5 years, doubled the operating surplus per cubic meter of wood produced, but the Treasury was not satisfied with the corporation's valuation of assets. VicForests (Corporation of Victoria, Australia) made a net profit in two years and loss in one year since its creation three years ago. However, it is worth discussing some of the problems associated with the creation of forest corporations.

First, normally the commercial operations of state forest agencies are mixed up with non-commercial operations, and therefore it is almost impossible to evaluate the commercial viability of a stand-alone corporation before hand. Second, in some countries it may be necessary to have annual commercial accounts for three years of the existing agency (state agency) for the creation of a forest corporation (for stock market valuation), and state agencies do not maintain commercial accounts. Third, the valuation of forest assets, for transfer from state agency to corporation, is the biggest challenge, and without proper valuation of transfer assets, financial analysis of the corporation operations will be misleading. Fourth, the process of creating a commercial forestry corporation, out of a government department, may take many years due to differences in accounting systems, staff structures, and organizational cultures. Finally, the low rate of return on forestry activities suggest that the corporation may need government subsidies indefinitely

3.8.5 Creation of Separate Business Enterprise within the State Forestry Agency

The creation of a separate business enterprise within the state forestry agency is the most dominant mode of recent forest tenure reforms. Many countries, such as the United Kingdom, Germany, many states in Australia, and many countries from transition economies (such as Croatia Latvia, Estonia, Romania, Slovakia) have created state enterprises for commercial activities within the forestry agencies.

The creation of SE, as compared to corporation and privatization, has some advantages. First, it avoids the key problem related to the valuation of forest assets, because forests assets are not being transferred to another agency. Second, it offers the flexibility to state agencies in terms of activities which can be transferred to these state enterprises, some examples are given in Table 4 where different countries have made different choices. Third, these enterprises will have a high degree of acceptability from public and environmental groups as well as from politicians and forest industry. Finally, the cost of creation of state enterprises within the state agency will be much lower than the cost of privatization and corporatization. However, the creation of SE can also be criticized for lack of professionalism, government control, the same organizational culture as the state agency, and the lack of clarity about the division of responsibilities or overlapping responsibilities. These may be true in some cases, but I believe the basic fact is:

“In fact there is very little empirical research which shows that organizational structures, by themselves and in isolation, are the key element to a successful reform process. To the contrary, the evidence strongly suggests that the functional form of a forest organization simply does not matter. Very different models can succeed, and very different models can fail..... To argue that any of these models are “better than others is to ignore the frameworks of accountability and governance which underpin

each of them, and which are derived from a range of political, economic, and physical factors which are in many respects unique and which have historical, social, and cultural elements to them .” (The World Bank, 2005)

These observations are fully supported by the diversity of forest tenure reforms in China, and different approaches taken by various ex-communist countries Europe.

3.8.6 Some Other Observations

The case of forest concessions to private companies on public forests in Brazil provides a good example of the use of the Canadian system of forest licenses in other countries. On the other hand, examples of community forest tenures from India and Nepal provide us good learning material for community tenures in Canada. In addition, while people talk about privatization of about 100,000 hectares of softwood plantations in Australia, they totally ignore Regional Forest Agreements (RFA) which cover about 23 million hectares of productive forests in Australia. These RFAs are good examples of balancing environmental, social, economic, and heritage values and provide certainty for all sectors of forestry - forest-based industries, forest-dependent communities, and conservation efforts. These RFAs may provide lessons for the Canadian forest policy makers and managers.

4. Timber Pricing Mechanisms

In general, an ideal timber pricing system should reflect demand and supply factors of timber, which will include availability of timber in a given area, quality and volume of timber, harvesting costs, and distance from the processing facility. Due to large transportation costs of timber, timber markets are generally spatial markets that limit the number of buyers who can buy timber in a given geographical area, and this introduces imperfections in timber market from buyer side. On the other hand, where most forests are owned either by the state or some big forest owners, such as forest companies, the numbers of sellers are limited, and it introduces market imperfections from suppliers' side. Hence, generally timber markets are not perfect, and timber pricing is always subject to some short of market imperfection.

4.1 Timber Pricing Mechanisms Used By Different Countries

In view of the facts stated above, a wide range of pricing mechanisms are used to fix timber prices in different countries. The most common pricing mechanisms are administered prices, negotiated prices, timber auctions, tenders based on market reference prices, or prices reflecting the cost of production and forest management. In the state owned forests, the most common approach is administered prices, but timber auctions and tenders are also used in some countries. The key parameters and the basic principles of determining administered prices vary across jurisdictions, but the most common approach in developed world is based on the Residual Value approach, which is common in most of the provinces in Canada and many states in Australia. In recent years, British Columbia in Canada and Victoria in Australia have started timber auctions at a smaller scale, and timber auction prices are used to determine

administratively fixed timber prices in these jurisdictions. However, due to wide variation in forest terrain and forest types, the governments of these states still have to use many administratively determined parameters in their calculation of timber prices.

In the United States, most of the states and federal government use timber auctions for the sale of their timber. In the most western European countries, where private forest ownership is dominant, timber sale arrangements are made through bilateral negotiations between the buyer and seller (The World Bank, 2005). In addition, privately arranged concessions are also common, specifically when private forest owners have forest management service contracts with private companies (The World Bank, 2005). In many transition economies, mostly timber sales are arranged by state forest enterprises, and prices are fixed administratively using market prices as a reference point (The World Bank, 2005). Latvia and Romania are exceptions which rely on timber auction markets for sale of timber to harvesting or other companies (The World Bank, 2005). In countries like Finland and Germany, where forest cooperatives play a critical role in forest management by private woodlot owners, in many cases cooperatives negotiate timber prices for their members with forest companies.

In the USA, forest companies use three different approaches to buy timber. In the first approach, mills fix mill-gate timber price or price at the mill-depot, and any supplier can bring the timber of pre-determined specifications to the mill-gate or mill-depot, and the mill will buy at the price which is already advertised. Second, mills enter into supply contracts, which include prices, with secondary suppliers; the secondary suppliers buy from primary suppliers, and prices in these sales, between primary and secondary suppliers, are determined through bilateral negotiations, or some times these negotiations are facilitated through consultants. Third, mills participate in auctions by big suppliers like state forest departments or few selected big forest owners. .

In recent years, there has been a big push by the USA for timber auctions in Canada, and British Columbia, started offering its 20% timber through timber auctions. Hence, it will be useful to provide some analysis about timber auctions.

4.2 Auctions and Competitive Market Prices

Auctions have long been used to transfer goods, and they have become enormously popular in recent years. The reasons are not too obvious, but some people argue that it has some economic logic behind it. In the beginning, auctions were used for artworks and antiques, and these products have no known fixed price in the market, each artwork is uniquely different from all the rest and its price is unknown to the seller. The price is largely determined by the purely subjective evaluation of the individual who derives some pleasure in its ownership. Auctions, for such products, can definitely help in fetching the highest price from a person who values the work most. Over time, four different types of auctions – English auction (ascending prices), Dutch auction (descending prices), a first price sealed bid, and a second price sealed bid auction – have developed, and each has its merits and demerits (Crowley and O'Connor 1993). Economists are proud of their role in pushing for auctions even after knowing the demerits. Coase (1959) was among the first to advocate auctioning the radio spectrum. But, many auctions, including some designed with the help of leading academic economists, have been fiascoes

(Klemperer 2002). Hence, it is necessary to understand different aspects of auctions. Some general features and pitfalls are discussed below:

First, an auction can never meet the requirement of a large number of buyers and large number of sellers, a necessary condition for a perfectly competitive market. Normally, an auction has one seller and many buyers (monopolist), or one buyer and many sellers (monopsonist). Hence, the outcome of an auction will never be equal to a market price set by a perfectly competitive market. Second, a successful auction, defined in terms of getting fair market price, generally requires: (i) sufficiently large number of buyers or seller to ensure effective competition; (ii) a defined and public set of rules to be followed during the auction; (iii) a well defined and marked object or good to be sold; (iv) small transaction costs, associated with designing, holding, and implementing the results of auctions, with respect to the total revenue from auction; and (v) no side payments or other such considerations that would compromise the integrity of the process. Due to these strict and diverse requirements for successful auctions, many pitfalls have been observed in auctions.

The first major concern involves the risk that participants may explicitly or tactically collude to avoid bidding up prices. The second concern involves attracting bidders since an auction with too few bidders risks being unprofitable and potentially inefficient. Ascending price auctions are often particularly poor in this respect, since they can allow some bidders to deter the entry, or depress the bidding, of rivals. The third major concern is setting of a proper reserve price (a minimum amount the winner is required to pay). Inadequate reserve prices also increase the incentives for predation and may encourage collusion that would not otherwise have been in the interest of all bidders. A stronger bidder in an ascending auction has a choice between either tactically colluding to end the auction quickly at a low price or forcing the price up to drive out the weaker bidders. The lower the reserve price at which the auction can be concluded, the more attractive is the first option. It is not uncommon to observe political, industrial or administrative interests contributing to low reservation prices. Fourth, in some cases, the auction rules may leave gaping loopholes, or it may not be possible for the auctioneer to punish a bidder violating the auction rules when just one bidder needs to be eliminated to end an auction, because excluding the offending bidder would end the auction immediately, and it may be hard to impose fines large enough to have a serious deterrent effect (Klemperer 2002).

Timber auctions in the US have been the main driving force behind the argument for starting timber auctions in Canada, and therefore it will be useful to know some thing about the US timber auctions.

4.2.1 Some Observations about the US Forest Service Timber Auctions:

In fact, USFS auction sales are commonly known as “Below-cost Timber Sales on Public Lands” (Barber et al. 1994). The USFS in its annual report for the financial year 1998 reported a loss of \$126 million for 1998 and a loss of \$116 million for 1997 in its forest management program. In 1998 for a sale of 3.3 BBF timber sale receipts were \$452 million and total direct costs on timber sale were \$597 million, resulting in a net loss of \$145 million (USDA 2001b, p, 60). However, there are many claims that these figures do not reflect the total federal costs associated with timber sales program. Reed (2002) estimated that below cost timber sales in the

U.S. account for a subsidy of \$500 million /year, an average of \$125 per thousand board feet; and in 1998, only 2 out of 109 National Forests paid their way.

The performance of the USFS in terms of revenue generation and cost reduction has been a continuous concern to the United States General Accounting Office. USGAO, in its report to the Chairman, Committee on the Budget, House of Representatives in 1998; observed:

“When the Congress has given the Forest Service the authority to obtain fair market value for goods or recover costs for services, the agency often has not done so ..., and (3) not used sealed bids for timber sale, relying instead on oral bids, which generate lower revenue.

The Forest Service has also not always acted to contain costs, even when the Congress has asked it to do so. In fiscal year 1991, for example, the Congress asked the agency to develop a multiyear program to reduce the escalating costs of its timber program by not less than 5% per year. However, the Forest Service has not developed such a program, and the costs of preparing and administering timber sales remain high even though internal and external reviews of agency’s processes and procedures have identified opportunities to significantly improve operational efficiency at virtually every organizational level.” (USGAO 1998, p. 5-6)

The matter of below cost timber sales is very serious and has drawn continuous attention from USGAO. In 2001 USGAO attempted to determine the total net federal costs¹ associated with the Forest Service’s timber sales program for the financial years 1997, 1998, and 1999. However, USGAO could not succeed in its attempt, and observed:

“While we deferred our response to your questions pending the Forest Service’s completion of the fiscal years 1998 and 1999 TSPIRS (Timber Sales Program Information Reporting System) reports, ultimately it was the serious accounting and financial reporting deficiencies that existed at the Forest Service during fiscal years 1998 and 1999 that precluded us from making an accurate determination of the total federal costs associated with the timber sales program for fiscal years 1998 and 1999. These deficiencies rendered the Forest Service’s cost information totally unreliable.

Because the foundation upon which we could have added other identified net federal costs related to the timber sales program was unreliable, we did not contact the Department of Justice or other federal agencies we believed might have incurred significant costs in support of the timber sales program in order to determine the costs they incurred related to the program” (USGAO 2001, p. 1-4).

In the light of these discussions, it is worth noting that the USGAO designated Forest Service financial management as one of "our high risk areas" in January 1999 (High Risk Series:

¹ In this report total net federal costs included the costs incurred by the Forest Service to carry out the program as well as costs incurred by other federal agencies that either support the timber sales program or incur costs as a result.

An Update, GAO/HR-99-1, Jan 1999) and continued this designation in January 2001(High-Risk Series: An Update, GAO-01-263, Jan 2001).

Forest economics literature also supports many of the weaknesses of USFS timber sales program. A general perception is that bid prices on public lands are lower than bid prices on private lands in the same area², and similarly the prices paid for public leases are substantially less than for private leases (LaFrance and Watts 1995). The potential for collusive bidding at government timber sales has long been recognized (Cassady 1967, p. 186). In 1977, it was a focus of congressional hearings (US Senate 1977); nevertheless, the Justice Department has been able to successfully prosecute less than a handful of cases Baldwin et al. (1997). By the analysis of the USFS timber sales data in Pacific Northwest, for the period of 1975-81, Baldwin et al. (1997) found that winning bids are best explained by bidder collusion. Similarly, Brannman (1996) observed collusion in sealed-bid auction and preclusive bidding (a type of collusion) in oral timber auctions of USFS. The author found that outsider firms that may have been more efficient in either their operations or total hauling costs were precluded from bidding in oral auctions.

In a debate over “below cost sales” the USFS is accused of setting timber sales reserve prices below the full cost of forest management, and thus offering the industry an indirect subsidy. Carter and Newman (1998) found that reserve prices are not set optimally, and increasing reserve prices will likely increase timber revenues on sales in North Carolina. However, the USFS has been putting forward two main arguments in the defense of these below cost timber sales. First, the national forests have a different mandate than a private timber growing business; significant differences exist in terms longer rotation, higher level of growing stock, greater emphasis on natural and uneven-aged forests and non-timber benefits, and the greater emphasis on the analysis of potential environmental affects. Second, timber sales provide many benefits beyond the revenue earned, such as employment opportunities, additional incomes to individuals and business, increased taxes to different levels of government, and the receipt share payments that go to benefit local schools and roads (USDA 2001b, p. 69). All these arguments of USFS can be defended in the context of social welfare maximization, but there is no doubt that the Below Cost Timber Sales subsidize the timber industry, and do not provide any evidence that an auction system is capable of getting the timber prices that would prevail in a free competitive market. Similarly, the experiences of USFS do not provide any evidence that the auction system for standing timber is better than RTV based administrative pricing, at least from the perspective of getting competitive market prices for timber.

4.2.2 Market Performances of Residual Value and Auction-based Stumpage Systems

The BC Ministry of Forests (MOF) has been using timber auctions on a small portion (20%) of annual harvest. The central concept of the BC stumpage system is that auctions of stumpage establish the market values which can then be used to set the stumpage price for timber harvested under long-term tenures (BC MOF 2004). The potential acceptance of this system depends on the capability of auctions to simulate a truly competitive market (Niquidet and van

² Munn and Rucker (1995) found, from 220 private sales and 99 USFS sealed bid timber sales in North Carolina during 1987 and 1991, that per acre prices are about \$675 (\$1103 per acre on private sales and \$427 per acre on USFS sales) higher on the private sales.

Kooten 2006). It is noted that lack of competition is perhaps the biggest obstacle to auction-based pricing (Fox 1991). Niquidet and van Kooten (2006) examined the impact of competition on the effectiveness of using auctions to determine the stumpage fees on public forestlands in the BC interior and found that lack of competition in several northern zones of BC has caused the bids to be lower than their true values by \$Cdn1.47 – 2.64/m³ and particularly in one zone dominated by only one significant manufacture (monopsony) which has substantial market power in this district, the bids are less than their true values by \$Cdn12.56/m³, which is about equal to the transportation cost to the nearest sawmill in an adjacent zone. In addition, they found that the stumpage equation based on ordinary least squares method (OLS) (proposed and used by the U.S. for timber valuation) biases the true value of forestlands – it tends to overestimate the value of lower-valued stands and underestimate the value of higher-valued stands. Moreover, their results imply that the imposition of the CVD resulted in a decline in bids by \$Cdn 5.21/m³, which is probably neither the intension of the BC government nor the U.S. government. Furthermore, they concluded that in BC increased dependence on timber auctions to issue harvest rights and determine stumpage prices will face challenges, one of which is dealing with the different levels of competition throughout the province and failure to address it would significantly hinder the success of an auction-based stumpage pricing system. Roise (2005) examined the performance of the auction-based system on the BC coast and found that tenure holders may pay more or less than the market price in the short-term and pay more than the market rates at least 50 percent time and pay less than 50 percent time in the long-term.

On the basis of the comparison between the Ontario's residual value (RV) based stumpage system and the above mentioned findings about the BC's auction based stumpage system, Yang and Kant (2008) observed that: 1) both the auction-based and RV-based system may underestimate the market value of timber in some stands or in the short-run; 2) when there is lack of competition, particularly in a market dominated by monopsony, the auction-based system may generate a stumpage price less than the price determined under RV-based pricing system; 3) when the softwood lumber trade is controlled by trade restrictions, specifically by the import tariff regime, the RV-based stumpage systems generates a higher stumpage price as a result of a higher mill net price induced by the trade restriction; however, the auction-based stumpage system generates a lower stumpage price as tariff is a significant cost to the producer and it reduces the producer's ability to pay a higher stumpage price; 4) the auction-based stumpage system is more difficult to implement and evaluate with respect to the market performance as compared to the RV-based system given the different competition levels in the different regions of BC and Ontario.

In the United States, Spelter (2005) compared the timber prices reported by various public and private U.S. agencies and the estimates of timber value based on the RV approach. He found that the residual value estimates deviated from the reported prices; however, over 5 years, the deviations even-out each other. In addition, the Forest Service Prices (determined by auctions) were substantially lower than the RV calculations. These results indicate that the administratively determined stumpage prices based on the RV approach are not necessarily below the prices determined by auctions or the competitive price level in the long-run. Moreover, the prices determined by competitive auctions can deviate from the true market values of timber and thus may not result in true market values of timber in the U.S. markets, as believed and argued by the U.S. governments, in the short-run. Therefore, the RV-based stumpage price

system may not be worse, instead may even be better than the market performance of the auction-based pricing system in an area where there is a lack of competition. Similar conclusion was reached by Leefers and Potter-Witter (2006), who compared four public agency stumpage pricing systems in the Lake States, bordering to Ontario, where forests have similar species composition, but are managed under different institutions. They concluded the RV approach is more appropriate to areas with little competition and in Northern Ontario where competition is limited, this traditional approach including product market may provide the best method for determining stumpage prices.

4.3 Key Inferences about Timber Pricing Mechanisms

Timber pricing is not like pricing of milk or cake or vegetable. Heavy transportation costs lead to a spatial market of timber. Diversity of ownership (forest companies, private landowners, and governments) of forests, and totally different economic and management interests of these owners from forests further adds to the complexity of timber pricing. All these conditions put together assure that a perfectly competitive market will never exist for timber. Hence, the choice of timber pricing mechanisms means the selection of the second-best mechanism, and there is no evidence to suggest that timber auctions or timber auctions based calculations of stumpage will be always better than the residual value based stumpage system. All the candidates of the second-best pricing mechanisms have their merits and demerits, and forest managers' challenge is to select the pricing mechanism which has the highest potential to be the second best in the given forest, social, and economic conditions, and work hard to prove it the right choice. However, if it becomes clearly apparent that the choice is not the correct one, the choice should not be defended on arbitrary grounds and blind faith in the selected mechanism.

5.0 Conclusions

In this paper, we examined three critical aspects – forest ownership, dynamics of forest tenures, and timber pricing mechanisms - related to forest management institutions or forest regimes. The analysis of forest ownership demonstrated that the extent of private forest ownership in Canada is not dismal as projected by many scholars by using the percentage of forest area as a measure of ownership. In fact, 26.5 million hectares of forests are under private ownership in Canada, which is higher than that of national forest area in more than 200 countries, and these countries include all developed European countries (including four European countries which are members of the G8), Japan, New Zealand, South Africa, South Korea, and Malaysia. In addition, even in terms of forest area owned by forest companies, Canada is third, after the USA and Sweden, and the Canadian forest industry owns more forest land than forest industries in any other developed country, except in the USA and Sweden, including Finland, Japan, New Zealand, and Australia. However, this huge private forest ownership does not mean that forest tenures in Canada are economically optimal and/or are the best to meet social and ecological values of the Canadian people. In fact, forestry in this century, specifically in the next two or three decades, is going to be drastically different than forestry in the last three decades. Hence, Canadian policy makers and forest managers have to come up with innovative forest tenure arrangements to meet these challenges and to provide global leadership. Next, we propose some key elements/guiding principles for forestry tenures in Canada.

Forestry Tenures for the Future: Policy makers have to remember that new forest tenures need to meet future challenges and not deal with the historical forest sector. It is quite evident that the future of the forest industry is not in the conventional wood commodities, such as lumber and pulp, but future forestry industry will be dominated by bio-composites, bio-fuels, and bio-refinery. Hence, forest tenure reforms should not only account for these emerging industrial trends, but should set a stage for Canadian leadership.

Forest Tenure for Multiple Forest Attributes: The main focus of existing forest tenures has been on timber while other attributes such as recreation, aesthetics, biodiversity, and carbon has been treated as secondary products. The Government-owned forest company – Sveaskog AB – provides a very good example of managing multiple attributes of forests for business purposes. In future, many of these forest attributes will become more valuable than in the past, and some of these attributes may provide better financial returns than timber. Hence, future forest tenures should be designed to optimize returns from all forest attributes and not only from timber.

Flexible, Diverse, and Adaptive Forest Tenures: The forest sector, including the forest industry, is in a transitional stage, and there are indications of future trends. However the picture is not completely clear, specifically in terms of the dominance of bio products. In addition, climate change may bring some surprises to the forestry sector. Hence, forest tenure reforms should give highest priority for flexibility, diversity, and adaptiveness, so that we do not commit the same mistakes as we did in the past – lack of flexibility and diversity in forest tenures. There should be enough diversity in forest tenures to provide optimal tenure arrangements to diverse forest industry stakeholders as well as other stakeholders.

Forest Tenures to Promote Competitiveness: Currently, Canada belongs to the category of developed world, which is a quite different economic situation than the early 20th century when the existing forest tenures were started. Hence, now the focus of forest tenures should be to promote competitiveness among forest industries, and only the fittest industry should survive. Forest tenures should discourage the treatment of the forest industry as a dependent child or industry, which runs to the government for every problem encountered. The government should create forest tenures not for a secure supply of timber at fixed prices, but should aim for a secure supply of timber for those who can afford it at competitive prices. Hence, if a particular industry wants a security of five, ten, fifteen years, the industry has to pay the price for that security. This will require diversity and flexibility in forest tenures.

Forest Tenures for Economically Optimal Timber Supply and Not for Timber Supply Based on AAC: Forest managers have to move beyond the concept of biologically determined annual allowable cut and the idea that timber harvesting is necessary for the health of forests. Forest tenures should allow the determination of annual harvest based on economic and biological factors, separately, and the minimum of the two should be used. In fact, in determination of economic harvest, the government should consider its monopolist position in forest ownership. The reduced timber harvest may solve the softwood lumber dispute problem, it will increase softwood lumber prices which should lead to increased economic returns to the competitive forest industry, and it will provide more economic returns per unit of timber harvested to the owner of forest. Environmentalist will be happy with this, and it will provide more space to other forest values. A negative side effect of this will be closure of inefficient

mills leading to increased unemployment in some communities. However this is not an uncommon phenomenon in developed economies, and in fact is presently being faced by all communities.

Forest Tenures to Maximize the Value of Timber Harvested and Not to Maximize the Harvest: Nanotechnology has revolutionized the use of fiber from trees and other biological products, and this will increase the value of fiber from trees to a significant level. These technological changes are also expected to create more jobs per cubic meter of timber. Hence, future tenures should be focused on maximizing the economic value from timber fiber and not maximizing the timber harvest.

Non-separation of Forest Management and Timber Allocation and Harvesting: Forest management and timber allocation and harvesting are inter-dependent and non-separable, and therefore forest tenures have to deal with them jointly. However, it does not mean that the same agency will have to deal with both.

Privatization of Forests: Privatization of forests may mean sale of forestland to private individuals, community organizations, education and religious organizations, local governments, and forest companies. Sale of forestlands to all these different agencies will have different social, economic, and ecological implications to forest management, as well as the feasibility of sale to all these agencies has to be examined separately. In addition, privatization may also mean restitution of forest lands to previous owners, which in the case of Canada, are Aboriginal people. I believe that proponents of privatization are talking about sale of forest land to the forest industry, and not to any other agency or restitution. However, based on experiences from other countries and hard core economic facts, I do not believe it is an economically viable option. I will not repeat economic facts discussed in the paper, but I will add one other fact. I hope the proponents of privatization of forestland will agree that Canadian agricultural land is more productive than forestland. If Canadian farming operations cannot be economically viable without large government subsidies, how can forestry operations be economically viable without government subsidies? Hence, I strongly believe that any effort of privatizing forest land in Canada will not only be environmentally, socially, and politically unacceptable, but it will not be economically justifiable.

Institutional and Organizational Framework: Forest Tenures provide an institutional framework for forest management and timber allocation and harvesting. Organizations translate this institutional framework into real actions and forest management outputs and outcomes. As discussed earlier, the evidence strongly suggests that the functional form of a forest organization simply does not matter, and very different forms can succeed, though the same forms can also fail under different conditions. Hence, I would not like to make a pre-judgment without a complete analysis. I would suggest a SWOT (Strengths, weaknesses, opportunities, and threats) analysis of all possible functional forms – corporations, state enterprises, government-owned forest company (similar to Sweden) – for every province in Canada separately, and make a decision based on that analysis.

Timber Pricing Mechanisms: Similar to forestry organizations, different pricing mechanisms have their merits and demerits, and the same mechanism can provide very good results in some

areas while in others it may totally fail due to contextual factors. Hence, no mechanism, including timber auctions, can be prescribed for all areas. A SWOT analysis of these mechanisms will be a desired step before making a choice for any mechanism or before making a decision of substituting one mechanism with other.

Constitutions of an Expert Group on Forest Tenures: I believe that forest tenure is a highly complex issue which cannot be addressed properly and efficiently either by academic researchers or by forest managers and policy makers alone. Academic researchers have in-depth theoretical knowledge but are far from practical realities, while policy makers and resource managers have extensive knowledge of field realities but are not fully conversant in theoretical concepts. Hence, I suggest that the provincial governments should constitute expert groups and the mandate of these groups should be to carry out in-depth SWOT analysis of all institutional and organizational options. I also believe that consulting contracts, either to academic researchers or consultant organizations, cannot fulfill the same function as these expert groups. I would also suggest that no direct stakeholder, other than the owner of the forest resource, should be the part of these groups.

I hope these eleven points provide ample food for thought for decision makers. Additionally, to obtain first hand information about global forest tenure reforms, a well-planned conference or workshop with only invited speakers may also be an option.

Literature Cited

- Arnot, Christopher D. 2007.* Perceived tenure security and incentives for investment in Canadian forest tenures: A literature review and empirical analysis. M. Sc. Thesis, Department of Rural Economy, University of Alberta, Edmonton.
- Asserståhl, Roger. 2006.* Privatizing state forests in Sweden. Presented at the BC Forum Symposium “Creating New Opportunities: Forest Tenure and Land Management in BC”, November 1, 2006.
- Australian Government. 2007.* Australia’s Forests at a Glance. 2007. Commonwealth of Australia. 2008. State of Forests Report: 2008.
- Baldwin, L. H., R. C. Marshall., and J. Richard. 1997.* Bidder Collusion at Forest Service Timber Sales. Journal of Political Economy, 105(4), 657-699.
- Banerjee, Onil, Macpherson, A. J., and Alavalapati, J. 2009.* Towards a policy for sustainable forest management in Brazil: An Historical Perspective. Paper submitted to Forest Policy and Economics.
- Barber, C., N. Johnson., and E. Hafild. 1994.* Breaking the Logjam: Obstacles to Forest Policy Reform in Indonesia and the United States. WRI.
- BC Ministry of Forests. 2004.* Market Pricing System: Coast. Revenue Branch, Ministry of Forests (January 16, 2004).
- Brannman, L. E. 1996.* Potential Competition and Possible Collusion in Forest Service Timber Auctions. Economic Inquiry, XXXIV, 730-745.
- Birchfield, R.J. & Grant, I.E. 1993.* *Out of the woods—the restructuring and sale of New Zealand’s state forests.* Wellington, New Zealand, GP Publications. 250 pp.
- Block, Nadine E. and Sample, V. Alaric. 2001.* *Industrial Timberland Divestitures and Investments: Opportunities and Challenges in Forestland Conservation.* PinchotInstitute for Conservation. Washington, DC. 50p.
- Brown, C. 1997.* *In depth country study – New Zealand. Forestry sector outlook study.* FAO Working Paper No. 505/WP/05. www.fao.org/documents
- Canadian Council of Forest Ministers (CCFM). 1992.* Sustainable Forests: A Canadian Commitment, Hull, Quebec.
- Carter, D. R., and D. H. Newman. 1998.* The Impact of Reserve Prices in Sealed Bid federal Timber Sale Auctions. Forest Science, 44(4):485-495.
- Cassady, R. Jr. 1967.* Auctions and Auctioneering. University of California Press, Berkeley.

- Clarke, J. 1997. Logging costs skyrocketing in BC. *Logging and Sawmilling Journal*, 28(4):5-6.
- Clarke, M. 1997. *Devolving forest ownership in New Zealand: processes, issues and outcomes*. FAO Working Paper. www.fao.org/documents
- Coase, R. H. 1959. The Federal Communication Commission. *Journal of Law and Economics*, October 1959, 1-40.
- Crowley, R. W., and M. O'Connor. 1993. Auctions, Contracts and Property Rights in the Natural Resource Sector. Government and Competitiveness School of Policy Studies, Queen's University, Canada.
- Dachang, Liu. 2001. Tenure and management of non-state forests in China since 1950. *Environmental History*, 2001, 239-263.
- Dlomo Maude and Pitcher Mike. 2005. Juggling Social and Economic Goals: South Africa. In Garforth Mike, and Mayers, James (eds.). *Plantation, Privatization, Poverty, and Power: Changing Ownership and Management of State Forests*. London: Earthscan. Pp.223-245.
- Douglas, R. 1993. *Unfinished business*. Auckland, New Zealand, Random House New Zealand Ltd. 305 pp.
- Edgar, M.J., Lee, D. & Quinn, B.P. 1992. *New Zealand forest industries strategy study*. Wellington, New Zealand, NZ Forest Industries Council Publication. 278 pp.
- Fangming Chen and Qian Gao. 1997. Viewpoint Shared by Studies of Stocked Cooperative Economics in China, *Forestry Economy* no. 1 (1997): 65-68.
- Flynn, Robert. 2003. Changing Timberland Ownership Trends in the USA. Presented at International Conference on Global Forest Products Markets, September 9-10, 2003, Santiago, Chile
- Fox, Irving K. 1991. Politics of Canada-U.S. Trade. In Russell S. Uhler (ed.) *Canada-United States Trade in Forest Products*, Vancouver, Canada: University of British Columbia Press. pp.15-56.
- Gargavel, J. 1995. *Fashioning Australia's Forests*. Oxford University Press, Melbourne.
- Government of India (GOI). 1976. Report of the National Commission on Agriculture, Part II, Volume.9. Government Press, New Delhi.
- Government of India. 1990. Report of the Team of Experts to Review the Functioning of State Forest Development Corporations under the State Government/Union Territories. Ministry of Environment and Forests, Government of India, New Delhi.

- Government of India. 2002. Joint Forest Management: A Decade of Partnership. Ministry of Environment and Forests, New Delhi.*
- Gray, John A. 2003. Forest Tenures and Concession Experience in Canada and Selected Other Countries. In "Institutional Changes in Forest Management in Countries with Transition Economies: Problems and Solutions" Workshop Proceedings, Moscow, Russia, February 25, 2003.*
- Grundy, David. 2005. From plantation development to steward of the Nation's Forests: the UK In Garforth Mike, and Mayers, James (eds.). Plantation, Privatization, Poverty, and Power: Changing Ownership and Management of State Forests. London: Earthscan. Pp.246-265..*
- Haley, D., and Nelson, H. 2007. Has the time come to rethink Canada's Crown forest tenure systems? Forestry Chronicle, 83(5):630-641.*
- Haley, D. 1996. Paying the piper. The cost of the British Columbia Forest Practices Code. RPF Forum 3(5):26-28.*
- Hickman, C. 2006. TIMOs and REITs. Forester, R&D, Policy Analysis Staff*
- Hong Jiang and Pingkang Liu, 1997. A Study on Collective Forest Property and Income Distribution, Forest Economy no. 4 (1997): 31-39.*
- Ireland, Lloyd C. 2005. US Forest Ownership: Historic and Global Perspective. Maine Policy Review. Winter Issue. pp. 16-22.*
- Kanel, Keshav R., Durga R. Niraula 2004. Can Rural livelihood be improved in Nepal through community forestry. Banko Jankari, Volume 14 (1.)*
- Kanel, Keshav Raj, Poudyal, Ram Prasad, & Baral, Jagadish Prasad. 2005. Nepal: Community Forestry 2005. In Noelle O'Brien, Sam Matthews & Michael Nurse (eds.). The Proceedings of First Regional Forestry Forum: Regulatory Frameworks for Community Forestry in Asia, held in Bangkok, Thailand, August 24-25, 2005. pp. 69-84.*
- Kant, S., and R. A. Berry. 2005. Institutions, Organizations, and External Setting: Dynamic of Institutions. In S. Kant and R. A. Berry (eds.) *Sustainability, Institutions, and Natural Resources: Institutions for Sustainable Forest Management* (pp. 83-114). Dordrecht: Springer*
- Kelsey, J. 1997. The New Zealand experiment – a world model for structural adjustment? Auckland, New Zealand, Auckland University Press. 433 pp.*
- Kirkland, A. 1988. The rise and fall of multiple-use forest management in NZ. NZ J. Forestry, 33(1): 9-12.*

- Kirkland, A. & Berg, P. 1997. *A century of state-honed enterprise*. Auckland, New Zealand, Profit Books. 176 pp.
- Klemperer, P. 2002. What Really Matters in Auction Design. Journal of Economic Perspective, 16(1), 169-189.
- LaFrance, J. T., and M. J. Watts. 1995. Public grazing in the West and Rangeland Reform 1994. American Journal of Agriculture Economics. 77:447-461.
- Leefers, Larry A., and Karen Potter-Witter. 2006. Timber Sale Characteristics and Competition for Public Lands Stumpage: A Case Study from the Lake States. *Forest Science* 52: 460-467
- Le Heron, R., Johnston, T., Johnson, R., Anderson, G., Armstrong, J., Hartley, M., Aldwell, P. & Roche, M. 1996. Farms, fisheries and forests. In R. Le Heron & E. Pawson, eds. *Changing places in New Zealand*, pp. 120–168. Auckland, New Zealand, Longman Paul Ltd.
- Lu, Rong. 2008. Preferences of Industry and Government Stakeholders for Characteristics of Forest Tenures in Canada – An Application of Best-worst Scaling Methods. M. Sc. Thesis, Department of Rural Economy, University of Alberta, Edmonton.
- Luckert, Marty., David Haley, and George Hoberg. 2008. Canadian Tenure Policies for Sustainable Forest Management. Draft October, 2008.
- Macqueen, D., Grieg-Gran, M., Lima, E., MacGregor, J., Merry, F., Prochnick, V., Scotland, N., Smeraldi, R., & Young, C. (2003). *Growing timber exports: the Brazilian tropical timber industry and international markets*. Edinburgh: International Institute for Environment and Development. Retrieved October 14, 2007, from: <http://www.iied.org/pubs/display.php?n=2&l=2&a=R%20Smeraldi&x=Y>
- Mandel-Campbell, Andrea. 2009. Competing in the Global Marketplace - Why Mexican's Don't Drink Molsons. Presentation at the OPFA Annual Meeting
- Mayers, J., Evan, J., and Foy, T. 2001. Raising the Stakes. Impacts of privatization, certification and partnerships in South African forestry. London: IIED
- Minister's Council on Forest Sector Competitiveness. 2005. Final Report of the Minister's Council on Forest Sector Competitiveness, May 2005. OMNR, Toronto, Ontario. 46 p.
- MOA, 1984. China Agricultural Yearbook 1983, Beijing: China Agricultural Publishing House.
- MOF. 1987. China Forestry Yearbook 1949–86. Beijing: China Forestry Publishing House.
- Mooney, Scott. 1998. Understanding Timber MLPs and REITs. Timber Mart South Newsletter, 2nd Quarter. 2p.

- Morales, E. 2005.* Early experiences of total divestment: Chile. In Garforth Mike, and Mayers, James (eds.). *Plantation, Privatization, Poverty, and Power: Changing Ownership and Management of State Forests*. London: Earthscan. Pp.126-153.
- Munn, I. A., and R. R. Rucker. 1995.* An Economic Analysis of the Differences between Bid Prices on Forest Service and Private Timber Sales. *Forest Science*, 41(4), 823-840.
- Nelson, H., and William Nikolakis. 2008.* How does corporatization improve performance of government agencies? Lessons from restructuring of state owned agencies in Australia. Draft Paper.
- New Zealand Institute of Forestry Inc. 2005.* *New Zealand Institute of Forestry handbook*, ed. M. Colley. Christchurch, New Zealand, NZ Institute of Forestry Inc. 318 pp.
- Niquidet, Kurt, and G. C. van Kooten. 2006.* Transaction Evidence Appraisal: Competition in British Columbia's Stumpage Markets. *Forest Science* 52: 451-459.
- O'Loughlin, Colin. 2008.* Institutional restructuring, reforms, and other changes within the New Zealand forestry sector since 1986. In Patrick Durst, Chris Brown, Jeremy Broadhead, Regan Suzuki, Robin Leslie and Akiko Inoguchi (eds.) *Reinventing Forestry Agencies : Experiences of Institutional Restructure in Asia and the Pacific*, Rome FAO.
- Pollard, David, 2007.* Issues in Corporatization in Australian Forestry, presented at the BC Forum on Forest Policy and Economics, BC, May 11, 2007).
- Price Waterhouse Coopers. 2008.* Global Forest, Paper and Packaging Industry Survey. 2008 Edition – Survey of 2007 Results.
- Qian Gao et al.1997.* Investigation and Analysis on Stocked Cooperative Forestry in Anhui Province. *Forestry Economy* (1997):
- Ravenel, Ramsey; Tyrrell, Mary; and Mendelsohn, Robert (eds.). 2002.* *Institutional Timberland Investment*. A Yale Forest Forum Publication. Vol. 5. No. 3. New Haven, CT. 52p.
- Reed, FLC Les. 2002.* A Fresh Perspective on the Softwood Lumber War. www.ftlc.org. (January 17, 2003)
- Roche, M. 1990.* *History of New Zealand forestry*. Wellington, New Zealand, GP Publications Ltd. 466 pp.
- Roering, Hans-Walter, 2004.* Study of Forestry in Germany, Federal Research Centre for Forestry and Forest Products, Hamburg, Germany.
- Roise, Joseph P. 2005.* Observations on the New Stumpage Market Pricing System in British Columbia. http://www.sfu.ca/mpp/pdf_news/Roise-Observations.pdf

- Rumker, D. 2004.* Forestry investment in New Zealand: an attractive opportunity. *NZ J. Forestry*, 49(3): 8–10.
- Saigal, S. 2005.* Joint Management of State Forest Lands: Experience from India. In Garforth Mike, and Mayers, James (eds.). *Plantation, Privatization, Poverty, and Power: Changing Ownership and Management of State Forests*. London: Earthscan. Pp.177-199.
- Spelter, Henry. 2005.* Review of Alternative Measures of Softwood Sawtimber Prices in the United States. Research Paper FPL-RP-629. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.
- State Services Commission. 1982.* Report of the New Zealand Forest Service Review Committee, September 1982. Wellington, New Zealand, State Services Commission Report.
- Sunderlin, William D., Hatcher, Jeffrey, and Liddle, Megan. 2008.* From exclusion to ownership? Challenges and opportunities in advancing forest tenure reform. Rights and Resources Initiative, Washington, D.C.
- Sveaskog AB - www.sveaskog.se (accessed on March 30,2009)
- The World Bank, 2005.* Forest Institutions in Transition: Experience and Lessons from Eastern Europe. PROFOR at the World Bank, Washington DC.
- United Nations. 2000.* Forest Resources of Europe, CIS, North America, Australia, Japan, and New Zealand. Geneva Timber and Forest Study Papers, No. 17. United Nations, New York and Geneva.
- USDA, Forest Service, 2001a.* US Forest Facts and Historical Trends. FS-696-M, June 2001.
- USDA, Forest Service, 2001b.* National Summary: Forest Management Program, Annual Report, Fiscal Year 1998 (Preliminary Version).
- USGAO, 1998.* Forest Service: Barriers to Generating Revenue or Reducing Costs. *GAO/RCED-98-58*.
- USGAO, 2001.* Forest Service Timber Costs. GAO-01-1101R.
- U. S. Senate.* Timber Sales Bidding Procedures: Hearings before the Senate Subcommittee on Public Lands and Resources. 95th Congress, 1st Session, 1977.
- Veríssimo, A. 2006.* Estratégia e mecanismos financeiros para florestas nativas do Brasil. Food and Agriculture Organization. Retrieved June 16, 2007, from: http://www.docpark.net/FAO-Fo/Esp/NATIVA_BRASIL_fev06_Final_1.pdf

- Viana, M. B.* 2004. A contribuição parlamentar para a política florestal no Brasil. Brasília: Câmara dos Deputados. Retrieved June 16, 2007, from: http://www2.camara.gov.br/internet/publicacoes/estnottec/tema14/pdf/2004_10446.pdf
- Vic Forests,* 2008. VicForests Annual Report 2008. <http://www.vicforests.com.au/assets/docs/vicforests%20annual%20report%202008.pdf> Accessed on March 19, 2009.
- White, Andy, and Martin, A.* 2002. Who owns the World's forests? Forest tenure and public forests in transition . Forest Trends and Centre for International Environmental Law, Washington D.C.
- Yang, F., and S. Kant.* 2008. Rent Capture Analysis of Ontario's Stumpage System Using an Enhanced Parity Bounds Model. Land Economics, 84(4):667-688. (Joint author)