
Management and utilization of forest resources in Korea

Eui-Gyeong Kim¹ and Dong-Jun Kim²

*¹Division of Forest Science, Gyeongsang National University,
Chinju 660-701, Korea*

*²Department of Forestry, Chungbuk National University,
Cheongju 361-763, Korea*

Introduction

Forests provide a variety of products and environmental services. Yet, forest degradation is widespread globally, more so in the developing countries. This article is an attempt to summarize the important issues and problems related to forest resources in Korea.

Forest devastation and rehabilitation

Forest devastation became widespread during Japanese imperialism, reaching its peak in the year 1956. Over 90% of devastated forest land was in the southern part of Korean peninsula.

Illegal cutting of trees for timber and fuel wood, and slash-and-burn agriculture were the main causes of deforestation. To control illegal cutting, the government made the policy of marking of trees by government officials before they were cut. Further, government established checkpoints to check if unmarked trees were cut and exported. Even these measures did not turn to be highly successful. Forest conservation goal was better achieved from 1980 onwards when entry of people to government forests was regulated as evident from negligible rate of deforestation during post-1980 period (Table 1).

Table 1. Extent of deforested area (x1000 ha) during 1919-1987 period.

Year	Forest area	Non-tree forest area	Degraded forest area
1919	N/A	N/A	17.0
1933	N/A	N/A	205.5
1935	16,199	N/A	237.1
1946	N/A	N/A	412.0
1953	6,415.4	N/A	607.0
1956	6,691.8	N/A	686.2
1960	6,700.9	N/A	524.4
1965	6,613.6	1,244.2	120.8
1970	6,611.5	859.7	89.9
1975	6,575.4	646.9	70.0
1980	6,567.8	241.3	34.0
1985	6,531.1	244.4	5.3
1987	6499.1	184.4	1.2

N/A, Data not available.

Source: Forestry Administration (1989).

Area under slash and burn agriculture practiced since Chosun dynasty substantially increased during 1916-1946 period. Looking at threats to forest resources due to slash and burn agriculture, government brought out a law to put an end to this land use practice. As a result of strict implementation of this law, this agricultural land use virtually disappeared by 1978 (Table 2).

Table 2. Area under slash and burn agriculture in Korea during 1916-1979 period

Year	Area (ha)
1916	81,701
1933	366,570
1942	374,247
1946	47,686
1973	63,385
1974	52,565
1975	48,459
1976	18,998
1977	7,719
1978	912
1979	445

Source: Forestry Administration (1989).

Extraction of huge quantities of forest biomass for energy has been another significant factor that contributed to forest degradation. Dependence on forest products used as fuel increased substantially after 1945 when there was a drastic cut in use of electricity and coal. Migration of a huge population of refugees together with urbanization and lack of any formal forest property rights further aggravated pressure on forests after liberation in 1945. Policy interventions, such as encouragement of use of anthracite/peat and prohibition of transporting firewood to urban area, led to consistent decline in the use of firewood, more so, from 1975 onwards (Figure 1).

Reforestation was a major activity in erosion control and afforestation plans implemented by the government during 1973-1987 period. During the first plan period, ten fast growing tree species were identified for plantation and March/April period was identified as the most suitable period for plantation. Involvement of local administration system and schools was a reflection of appreciation of the government for participatory approaches. Restrictions on removal of litter from forest floor and promotion of composite fertilizers from 1973 onwards imparted significant success to planting

efforts. During the second erosion control and afforestation plan, as many as 21 tree species were identified for plantation. Most of the degraded forest area has been reforested/afforested during first and second plan period (Table 3) (Figure 2).

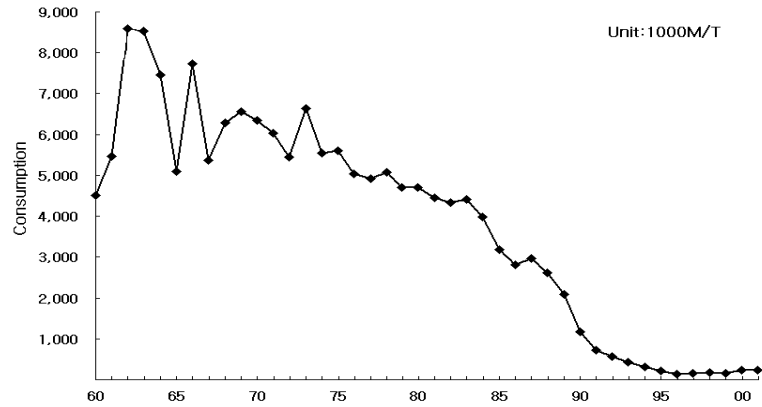


Figure 1. Consumption of firewood in Kenya during 1960-2001 period. **Source:** Statistics Year book of Forestry (Forestry Administration)

Planned economic development was set in from 1960s onwards. A realization that forest devastation implies drought and flood among policy makers and planners led to implementation of programs to control erosion by increasing tree cover. Prohibition of transport of firewood to urban areas together with incentives for plantation of fuelwood species and energy conservation in rural areas led to a drastic reduction in the demand of fuelwood. These interventions thus reduced threats to forests from unsustainable levels of fuelwood extraction. Demand of industrial timber also decreased over time partly because of increasing use of alternative materials.

A forest owner was required to have a proper management plan. If a forest was not managed in accordance with the plan, forest union was empowered to take over the management responsibilities. Industries dependent on raw material from forests were urged to raise and maintain their own forests. One was forced to replace a tree felled area within a 3 year period. Illegal cutting was considered a

crime as serious as robbery. The director of local administration agency was responsible for controlling and managing forest fire.

Table 3. Afforestation area by forest plan (x1000 ha)

Plantation species	First plan (1973-1978)		Second plan (1979-1987)		Third plan (1988-1997)	
	Goal	Area	Goal	Area	Goal	Area
Fruit trees	300	154	50	28	13	15
Fast-growing forest trees	300	360	750	442	42	33
Slow-growing forest trees	195	358	700	496	247	254
Others	205	208	-	109	15	19
Total	1,000	1,080	1,500	1,075	317	321

Note: The first plan was ten-year period, but completed shortly owing to the governmental aggressive endeavor.

Source: Forestry Administration (1989)

New Community Movement began in 1971 and developed with governmental support coupled with people's participation. Forestry administration was transferred from the Ministry of Agriculture and Forestry to the Ministry of Home Affairs for enabling forest resource development as a people's movement and initiative. Efforts were made to increase area and quality of forest resources through promotion of individual voluntary endeavors, cooperative endeavors and a synergy between individuals, cooperatives and government agencies.

Food and Agriculture Organization (FAO) documents reflect Korea as one of the best country in respect of development of forest resources after devastation during second world war even though it has a developing country status. Korea progressed economically more by conserving and regenerating its natural resource base rather than by adopting unsustainable ways of resource extraction. Korean afforestation/reforestation programs illustrate how one can move ahead for environmentally sound economic development. About 65% of national land of Korea is forest with steep slopes. In the absence

of a protective forest cover, disasters like flood during rainy season are quite likely.

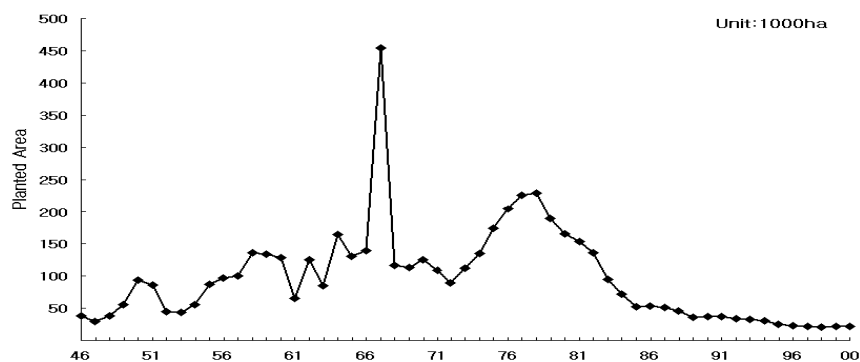


Figure 2. Area reforested during 1946-2000 period. **Source:** Statistics Yearbook of Forestry (Forestry Administration)

Management of forest resources

After achieving of afforestation/reforestation targets, focus shifted from creation of forest capital to its sustainable utilization. Forestry Administration of Korea started valuation of ecological services rendered by forests at 3-5 years interval from 1987 onwards. Economic value of forest ecosystem services including recreation, air purification, water conservation, soil outflow prevention, soil collapse prevention and wildlife habitat provision has been estimated to be 25 to 35 times higher compared to that of forest products (Table 4). Environmental services received more attention also because of economic uncertainties. Forest plantations raised in 1970s required thinning around 1990s. However, forest owners gave up thinning because of high expenditure/low profitability associated with thinning operations. In 1997 Korea experienced foreign exchange and unemployment crisis. To stand up with this crisis, government accomplished a public work project. About 32% of the project budget was invested for forest management. Systematic management of about 437,000 ha of forests in this project exposed the importance of forest management to people (Table 5). During 2002-2003, flood and landslides caused severe damages. Realizing that logs left in

forests significantly contributed to this problem, government established the policy of collecting logs lying in forests and thereby preventing natural disaster by forest management.

Table 4. Valuation of goods and services from Korean forests

(Unit: 100 million *Won*)

Function	Valuation				
	1987	1990	1992	1995	2000
Services					
Recreation	59,970	42,660	35,480	44,880	48,300
Air purification	45,790	47,780	83,797	72,280	135,350
Water conservation	30,400	83,660	79,318	99,300	132,990
Soil outflow prevention	34,730	45,950	57,630	64,000	100,560
Soil collapse prevention	3,080	4,090	14,664	16,630	26,360
Wildlife protection	2,590	9,560	5,211	7,790	7,680
Water still	-	-	-	41,230	48,270
Total of all services (A)	176,560	233,700	276,100	346,110	499,510
Tangible forest products (B)	6,921	7,314	8,252	9,798	17,268
A/B (%)	25.5	32.0	33.5	35.3	28.9
Gross National Product (C)	1,060,240	1,714,880	2,299,385	3,482,843	5,170,966
A/C (%)	16.7	13.6	12.0	10.0	9.7

Note: US \$ 1= about 1,200 *Won*

Source: Korea Forest Research Institute

Utilization of forest resources

Income from timber in mountain villages decreased from 13% of total income from forests in 1975 to 5% in 2000 because enforcement of policies that restrict timber extraction and promoted import of timber to meet domestic needs. On the other hand, income

from non-timber forest products including medicinal plants and wild vegetables has increased, more so after 1990 (Table 6).

Table 5. Some features of public work project launched by the Government of Korea

Classification	Total	1998	1999	2000	2001	2002
Budget (x100 million <i>Won</i>)						
Central administration (A)	18,383	2,083	7,000	5,300	2,500	1,500
Local administration (B)	5,804	549	1,766	1,589	1,200	700
Employment (x1000 persons)	15,544	1,486	4,833	4,299	3,220	1,706
Forest area managed (x1000 ha)	437	43	130	117	95	52

Source: Forestry Administration (2002)

Table 6. Contribution of different forest products (%) to total income in mountain villages in Korea during 1975-2000 period.

Products	1975	1980	1985	1990	1995	2000
Timber	13.3	8.2	6.5	8.6	6.9	5.3
Nuts	5.5	10.7	9.1	20.6	30.2	19.2
Mushrooms	3.0	3.8	5.4	8.8	9.3	9.9
Medicinal plants	0.5	0.4	0.5	1.4	1.4	0.6
Wild vegetable	0.3	0.2	0.7	3.5	7.0	9.9
Others	77.5	76.8	77.7	57.1	45.2	55.2

Since the 1990s, the demand for Goroswae (Painted maple, *Acer mono* Maximowicz) sap has been increasing. Villagers do not export this product, but provide it as a part of a tourist package. Such tourism linked promotion of non-timber forest products enabled not only economic benefits to villagers but also an appreciation of nature among urban people. Crops like *Jangnwaesam* (cultivated jingseng, *Panax schinseng*) were paid more attention in upland forests partly

because restrictions imposed on economic benefits from timber and partly because these crops yielded better quality products when grown under shaded conditions. Non-timber forest products were promoted by Forestry Administration through introduction of multiple-use forestry system. This system prohibited felling of trees but permitted cultivation of non-timber forest product species.

With increase in the demand for forest recreation, threats to conservation areas notified as national parks also increased. To cope up with this threat Forestry Administration introduced 'Recreation Forests' outside national parks. The first Recreation Forest was opened in 1988. Now there are 83 Recreation Forests (Table 7). Recreation Forest can be established not only in public/national forestland but also in private forestland. Recreation Forest brings restaurants and home-stay facilities in the neighboring villages and, through this change, economic upliftment of village communities. Forestry Administration is also making efforts towards rural development by developing infrastructure and essential services such as entrance road, water supply and drainage facility and facilities for storage of perishable products.

Table 7. Number of Recreation Forests and visitors during 1990-2000 period.

Parameter	Year		
	1990	1995	2000
Number of Recreation Forests	13	52	83
Visitors (1000 persons)	N/A	2,079	3,798

N/A, Data not available.

Conclusions

Devastation of Korean forests continued till 1950s. Large scale afforestation/reforestation efforts during 1960-90 period led to recuperation of forest cover in degraded areas. Synergy in government, non-government organizations and individual efforts together with an appreciation for conservation and sustainable use of forest resources in Korean culture enabled recover of forest capital that was degraded in the past.

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