

The forest sector's contribution to a “low carbon, green growth” vision in the Republic of Korea

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The country is pursuing green growth through the sustainable management and conservation of its forests and expanding its regional role.

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The Government of the Republic of Korea has designed a strategy to create a green society through its new national vision for the coming 60 years – “low carbon, green growth”. It aims to change the current approach, which involves an energy system that emits a large amount of greenhouse gases, into a low-carbon, more sustainable one. A smooth transition towards a greener economy requires specific enabling conditions, including national regulations, policies, subsidies and incentives; and international market and legal infrastructure, trade and technical assistance (UNEP, 2011).

This article describes some of the Republic of Korea's enabling activities over the past 60 years that will help move its vision forward for the next 60 years. It presents the successful reforestation of degraded forest areas in the Republic of Korea; discusses the flow of forest policies to increase forest value in the context of the government's “low carbon, green growth” vision; and identifies the role of the country's forest sector, both nationally and internationally, in green growth.

*The “bleeding heart” flower, **Lamprocapnos spectabilis**, grows in a forest in the Republic of Korea*



FOREST LOSS AND FOREST RECOVERY

The forests of the Republic of Korea cover 6.4 million hectares (ha), or about 64 percent of the total land area. In the past, particularly during the first part of the twentieth century, forests in the country were severely degraded. Until the 1960s, forests in the Republic of Korea suffered because of wars, illegal cutting and uncontrolled shifting cultivation. The timber stock volume dropped sharply to about 10 m³ per ha. However, after a series of successful reforestation programmes, described below, the stock had grown to 126 m³ per ha by 2010 (see, for example, Figure 1). Table 1 shows the increase in growing stock over time. The reforestation projects carried out by the Government since 1945 have resulted in about 12 billion trees planted on 4.25 million ha of land across the nation (Korea Forest Service, 1997).

Fuelwood plantation project, 1945–1976

The main causes of forest loss were large-scale clearing of forests and exploitation

1
Degraded forest in Pohang, Gyeongbuk Province, in the 1960s (top). In 1974, this area benefited from an erosion control project. The same area in the 1990s (bottom) shows the result of successful rehabilitation and restoration



Source: Korea Forest Service.

TABLE 1. Forest area and growing stock over time

Year	Area (1 000 ha)	Growing stock (1 000 m ³)	Growing stock (m ³ per ha)
1960	6 700	63 995	9.6
1970	6 611	68 772	10.4
1980	6 567	145 694	22.2
1990	6 476	248 426	38.4
2000	6 430	387 758	60.3
2010	6 369	800 025	125.6

Source: Korea Forest Service.

of forest resources for food and fuel. A substantial amount of fuelwood was required for heating homes in winter. The government initiated national fuelwood plantations in 1945, but the plans ended when the Korean War broke out in 1950. According to an inspection conducted in 1972, 56 percent (436 000 ha) of total plantations (780 000 ha) had survived (Lee, Lee and Kim, 1999).

During the 1960s and 1970s, in response to critical demand for wood for fuel energy in local communities, the government implemented a massive plantation plan using fast-growing trees. Species such as pitch pine (*Pinus rigida*), black locust (*Robinia pseudo-acacia*), alder (*Alnus* species) and sawtooth oak (*Quercus acutissima*) were planted, mostly from 1962 to 1972. Economically valuable species of fruit trees such as sweet chestnut (*Castanea crenata* var. *dulcis*) and timber-producing species

such as Japanese larch (*Larix kaempferi*), Korean pine (*Pinus koraiensis*) and Japanese cypress (*Chamaecyparis obtusa*) were also planted. Of the total forested area, 30 percent consisted of human-made plantations (Lee, 2000). This planting not only contributed to the fuelwood supply and expansion of the country's forest area, it also provided various ecological (e.g. biodiversity conservation and erosion control) and economic benefits.

National Forest Plans: evolution over time

The government has been implementing National Forest Plans since 1973, when the First Ten-year National Forest Plan for rehabilitation and restoration was established. Under this plan, an additional 207 000 ha of plantations was created. Additionally, from 1976 to 1977, about 127 000 ha of plantations (20 percent of the total plantation areas) was established through an International Bank for Reconstruction and Development (IBRD) loan of US\$4.4 million (Korea Rural Economic Institute, 1978). By 1977, the total area of plantations in the country had reached 643 000 ha (Table 2).

TABLE 2. Area of fuelwood plantation

Year	Area	
	Planned	Established
1959–1966	800 000	–
1967–1972	514 000	436 000
1973–1977	207 000	207 000
Total	1 521 000	643 000

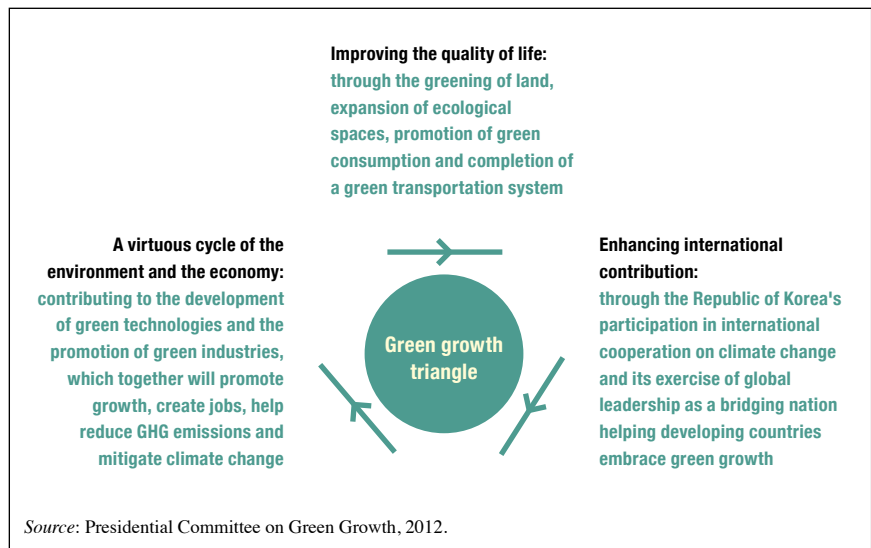
Source: Song, 1982.

²
**“Green growth triangle” foreseen in the
 “low carbon, green growth” strategy**

National Forest Plans have been adapted, over time, to reflect changing circumstances. From 1973 to 1987, the government concentrated on the reforestation of degraded forests through the First and Second Ten-year National Forest Plans. From 1988 to 1997, through the Third National Forest Plan, the government focused on the efficient use of forest resources to increase the economic value of forests and to improve public benefits. The Fourth Ten-year National Forest Plan, which was in effect from 1998 to 2007, established a foundation for sustainable forest management by developing a domestic framework and criteria and indicators, as well as by promoting the participation of civil-society organizations in forest management.

A new type of National Forest Plan: maximizing forest functions for green growth

Based on the foundations and frameworks established under the Fourth Plan, the Fifth National Forest Plan (2008–2017) is designed to expand the implementation of sustainable forest management. In particular, the Plan highlights the importance of forest functions, including carbon sinks, in responding to climate change. In implementing the plan, the Korea Forest Service continues to establish a foundation for the



sustainable welfare of society by developing environmental and social resources, and to pursue forest-related industries as a “blue ocean strategy”¹.

The overall vision of the Fifth Plan is “to realize a green nation with sustainable welfare and growth” by sustainably managing forests as key resources for strengthening the nation’s economic development, land conservation and quality of life.

**FORESTS AND “LOW CARBON, GREEN GROWTH”
 National strategy**

In 2008, in recognition of the need to ensure sustainable development, the government announced a “low carbon, green

growth” strategy as a new vision to guide the nation’s long-term development. This strategy contains policy goals to tackle climate change and energy issues, to create new growth engines through investment in environmental sectors, including forests, and to develop an ecological infrastructure (Figure 2). The following year, the Presidential Committee on Green Growth was established, and the National Strategy for Green Growth was released. As a medium-term plan to implement this Strategy, the Five-year Plan for Green Growth was announced and is being implemented by various ministries and offices.

In addition, the Framework Act on Low Carbon, Green Growth, the first law of its kind in the world, was enacted, which laid the foundation for the implementation of relevant policies. This Act enabled comprehensive and systematic approaches towards green growth.

The National Strategy for Green Growth envisages three main objectives and ten policy directions, based on a consensus

Saemaul Undong: reinforcing reforestation

The successful reforestation of degraded forest is attributable not only to the massive implementation of forest plans, but also to the initiation of a new community movement called “Saemaul Undong”. Launched in 1970 by the president, Saemaul Undong was an effort to modernize the rural economy of the Republic of Korea. Through this movement, the government was able to support human resources by promoting education and conducting training programmes in various parts of the country (Lee and Lee, 2005) to increase the number of forest managers and specialists while boosting reforestation and forest management efforts. Local communities were consulted upon implementation of forest policies, and the need for fuelwood was addressed in rural areas through the implementation of fuelwood plantation projects. Along with these projects, the government provided financial support to local communities through *forest kyes* (mutual aid associations).

¹ As used here, a “blue ocean” is a market that is not yet in existence and is therefore not affected by competition. A blue ocean strategy, as set out by Kim and Mauborgne (2005), describes the growth that an entity can generate by creating demand in a new marketplace.



Source: Korea Forest Service.

among societal, business, academic and government stakeholders. The three objectives are the mitigation of climate change and the strengthening of the country's energy independence; the creation of new growth engines and improvement of the quality of people's lives; and the enhancement of the Republic of Korea's international contribution.

The Five-year Plan for Green Growth of the Korea Forest Service

The government believes that forests are key resources for green growth. Forests in the Republic of Korea sequestered 41 million tonnes of CO₂ in 2007, which was equivalent to 66 percent of total carbon emissions in the country (Lee, 2010). To maximize forest value as a key resource, the Korea Forest Service has been working on pursuing green growth through such methods as bioenergy technology development, the conservation of forest resources, offering recreation forests and expanding urban forests, among others. Aside from the development of eco-friendly products, the Korea Forest Service is striving to improve its market competitiveness and to promote the production of high-value forest products like mushrooms, chestnuts, and medicinal plants.

The Korea Forest Service focuses on promoting the systematic implementation of forest conservation and management for the purpose of achieving well-balanced land development and conservation. It also plays a central role in efforts to prevent and mitigate the effects of natural

disasters, including improving ecosystem health and vitality and contributing to public safety and environmental conservation. The Korea Forest Service highlights the recreational and cultural functions of forests to improve the quality of life and the living environment in both urban areas and mountain villages.

In accordance with the Five-year Plan for Green Growth, the Korea Forest Service is pursuing the following forest policies: 1) reinforcement of a carbon cycle economy, with an emphasis on renewable forest resources; 2) conserving and managing forest resources; 3) improving the quality of a "green life"; and 4) sharing experiences and contributing to international dialogue. The next sections discuss these in more detail.

Reinforcing an economy based on the carbon cycle, using renewable forest resources

Since timber and forest biomass, such as wood pellets, are renewable natural resources that function as alternative fuel and carbon sinks, they are considered key resources for addressing climate change (Figure 3). In addition to supporting wood-pellet processing plants, wood-pellet boilers will be supplied to a large number of rural households. Biocirculation forests will be developed in areas in which *Pinus rigida* is concentrated. In some 24 villages across the country, timber produced within villages will be used

Engraved stone in the Baekdu-daegan Mountains, the Republic of Korea

3
Wood pellets (left), a greenhouse heated by a wood-pellet boiler (centre), and the wood-pellet processing plant (right), the Republic of Korea

to construct low-carbon wooden houses and facilities, creating sustainable villages. Timber supply systems have been constructed to enhance the value added of domestic timber resources, as well as to create new timber demand by developing eco-friendly wooden goods and to foster the forest biomass industry.

Conserving and managing forest resources as green assets

Among the protected areas designated to conserve biodiversity and enhance the functions of forest resources are the Baekdu-daegan Mountains, which are considered the backbone of the Korean Peninsula.



KOREA FOREST SERVICE



Lilies grow on the forest floor in spring, Republic of Korea

FAO/FO-7/94/BEOMTAEKIM







The Baekdu-daegan Mountains are a major range that stretches about 1 400 km from Mount Baekdu in the Democratic People’s Republic of Korea to Mount Jiri in the Republic of Korea. The range provides habitat for a great variety of flora and fauna and so is at the core of biodiversity conservation. The Act on the Protection of the Baekdu-daegan Mountains was legislated by the government in 2003 to preserve them. Based on the Act, land-development restrictions are placed on protected areas. About 263 000 ha (4 percent of the total forest cover) of protected areas in the country have been designated and classified into core and buffer zones of 170 000 ha and 93 000 ha, respectively (Korea Forest Research Institute, 2003).

As climate change has an impact on various elements that make up the forest ecosystem, capacity-building for adaptation to climate change is emphasized. The Korea Forest Research Institute has designated long-term ecological research sites to monitor the distribution of forest vegetation, changes in biodiversity and physiological reactions. In particular, monitoring

sub-alpine species will be reinforced, as these populations are expected to decrease. In addition, adaptive systems for disaster mitigation and response, as well as vulnerability assessment, are being developed as part of preventive measures against large-scale forest fires, landslides and forest pests. A programme of thinning and pruning pine trees contributes to maintaining healthy forests and enhancing their resilience, as well as preventing damage from forest fires.

Improving the quality of green life using forest resources

There is an increasing need for eco-friendly products and lifestyles and renewable energy. As well, the Republic of Korea is facing the challenge of an aging population. Forest resources are starting to be recognized as health assets for the elderly and the young, for healing, and as recreational spaces (Figure 4). According to a survey undertaken by the Korea Forest

From cradle to grave ... life with forests					
Prenatal	Early childhood	Adolescent	Adult and middle age	Third age	Death
Prenatal care	Kindergarten	Camping in forests	Recreational forests	Nursing homes in forests	Tree burial forests
15 places by 2012	60 places by 2012	200 places by 2012	10 places for leisure 157 places for recreation	2 pilot projects by 2012	36 burial grounds
					

4
A new paradigm for using forests to improve the quality of life
 Source: Korea Forest Service.



5
The Agreement between the Governments of the Member States of ASEAN and the Republic of Korea on Forest Cooperation was signed by foreign ministers during the 19th ASEAN Summit (18 November 2011, Bali, Indonesia)

Service, forests are used by about 20 million mountain hikers each year. Another survey showed that 77 percent of the people polled who were undergoing long-term healthcare prefer to stay in healing places, such as forests, during their continuing care. The Korea Forest Service is therefore establishing green welfare infrastructure, including recreational and healing forests. Currently, seven healing forests are available for short-term stays.

INTERNATIONAL COOPERATION

In the 1950s, the Republic of Korea was one of the less developed countries; its per capita national income was US\$67. In half a century, however, the country has achieved democratization, social stability and rapid economic development. It is, at present, the 13th largest economy (by gross domestic product) in the world (IMF, 2011). Overseas assistance such as the IBRD loan and support from the German Government, in particular for the establishment of the Forest Works Training Centre, has contributed to the successful implementation of reforestation projects.

The Government of the Republic of Korea is committed to sharing its reforestation experiences with those countries that are in need of cooperation for green growth. By sharing experiences and technologies with other countries, the Republic

of Korea is now leading some climate change initiatives at an international level. One of these is the establishment of the Asian Forest Cooperation Organization (AFoCO), which will contribute to conserving the global environment, thus boosting global efforts towards achieving green growth. Another was the hosting, in 2011, of the 10th Session of the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD COP 10). Both these initiatives are discussed further below.

AFoCO: a key engine for green growth in the Republic of Korea and the Asian region

Through the proclamation of “low carbon, green growth” as a key policy agenda for national development, a move from a conventional approach to economic and industrial development to an environmentally friendly approach to development was initiated. In order to share this vision internationally, the President of the Republic of Korea, Myung-Bak Lee, proposed the establishment of AFoCO during the Association of Southeast Asian Nations (ASEAN)–Republic of Korea Commemorative Summit in June 2009. Greening Asian forests and strengthening cooperation to address emerging forestry issues, including climate change, are the main objectives of this endeavour.

Today, about 20 percent of the world’s forest cover is located in Southeast Asia, where an estimated 200 million people rely on forests and their resources (ASEAN, 2011). AFoCO will be an ideal venue for tackling forest-related issues in the region.

After the establishment of AFoCO was proposed, intensive negotiations continued between ASEAN and forestry officials from the Republic of Korea, a process that led to the signing of the Agreement between the Governments of the Member States of the Association of Southeast Asian Nations and the Republic

AFoCO

Proposed by the Government of the Republic of Korea at the ASEAN–Republic of Korea Commemorative Summit in June 2009, the Asian Forest Cooperation Organization aims to facilitate field-oriented collaborative actions primarily addressing sustainable forest management and climate change issues in the region. Activities will be related to translating sound forest policies and proven technologies into action with a mission to prevent deforestation and to rehabilitate degraded forests.

Information on the initiative can be found at: www.afocosec.org.

of Korea on Forest Cooperation, at the 19th ASEAN Summit, in Bali, Indonesia, in November 2011 (Figure 5). The Agreement represents a milestone in the history of ASEAN–Republic of Korea forest cooperation. The Agreement entered into force on 5 August 2012, which led to the launching of the AFoCO Secretariat in Seoul in September 2012.

In addition to forestry cooperation activities between ASEAN and the Republic of Korea, the Agreement provided a legal platform for dialogue towards the establishment of AFoCO, which is expected to be realized two years from the entry into force of the Agreement. Third-party countries other than the ASEAN Member States and the Republic of Korea are also expected to be involved as members of the Organization.

AFoCO will be established as a legal regional entity under an intergovernmental multilateral arrangement involving ASEAN member states, the Republic of Korea and other Asian countries. The Organization’s vision and areas of cooperation are illustrated in Figure 6.

UNCCD COP 10 and the Changwon Initiative

In 2011, the Republic of Korea hosted UNCCD COP 10 in Changwon. During the event, the government proposed the Changwon Initiative, which was welcomed and endorsed by the country Parties. The objective of this initiative is to complement UNCCD’s ten-year strategic plan and framework to enhance the implementation of the Convention (2008–2018) through target-setting and the consolidation of effective partnerships. One of the main components of the Changwon Initiative is the Land for Life Award, which is expected to raise awareness of the importance of sustainable land management and encourage cooperation at all levels on initiatives to promote sustainable land management.

Also envisioned in the Changwon Initiative is the establishment of the Greening Drylands Partnership among developing countries. The Partnership seeks to address the mitigation of desertification, land degradation and drought at the global and subregional levels. Activities through the partnership involve promoting

Changwon Initiative

Proposed by the Government of the Republic of Korea at the 10th Session of the Conference of Parties to the United Nations Convention to Combat Desertification in Changwon, Republic of Korea, in 2011, the Changwon Initiative aims to complement the ten-year strategic plan to enhance the implementation of the Convention through target-setting and the consolidation of effective partnerships.

Full documentation on the Changwon Initiative can be found at: www.unccd.int/Lists/OfficialDocuments/cop10/misc5rev4eng.pdf.

community forestry for enhanced ecosystem services and local livelihoods, improving capacity-building on sustainable land management practices, and aligning with national action programmes. A separate, subregional partnership, the Northeast Asia DLDD (desertification, land degradation and drought) Network, promotes cooperation in controlling and preventing dust and sandstorms, as well as mitigating desertification, land degradation and drought, in the Northeast Asian region.

What we can do through AFoCo

Sustainable development for a green Asia

Forest rehabilitation and prevention of forest-related disasters	Climate change mitigation and adaptation	Sustainable forest management	Capacity-building and transfer of technology
<ul style="list-style-type: none"> • Rehabilitate forest ecosystems to prevent calamities • Restore degraded tropical forests and combat desertification in Asia • Prevent forest disasters 	<ul style="list-style-type: none"> • Enhance forest carbon stocks and support initiatives on mitigation and adaptation of impacts of climate change • Support REDD activities • Reinforce sound industrial plantations within the region 	<ul style="list-style-type: none"> • Promote sustainable forest management practices • Encourage sustainable trade of forest products • Protect livelihoods of forest-dependent and indigenous people • Promote community-based forestry activities 	<ul style="list-style-type: none"> • Improve human resource development • Public awareness • Conduct research and development in forest sector • Establish a database for comprehensive information-sharing

CONCLUSION

Evolution of National Forest Plans over time

The Republic of Korea acknowledges that forests are a key resource for the implementation of the government policy on “low carbon, green growth”. The government has demonstrated its commitment to the forest sector over the past 60 years, particularly through a series of intensive National Forest Plans, which have evolved over time to reflect changing situations. Whereas the First and Second National Forest Plans focused on rehabilitation

⁶ *Vision of the Asian Forest Cooperation Organization*

and restoration of degraded forests, later National Forest Plans highlighted the efficient use of forest resources. Given the particular challenges at hand in the country, such as the ageing of the population, it has become evident that there is a need to strengthen the nation's development and quality of life.

With the current Fifth National Forest Plan, the Korea Forest Service is striving to build a sustainable green nation in line with the national strategy of low carbon, green growth through sustainable forest management.

Lessons learned from the past for a sustainable future

The Republic of Korea is building on its successful reforestation, having planted approximately 12 billion trees. The transition to a green economy is well under way, with long-term investments in the forest sector and the comprehensive implementation of forest policies reflecting changes over time at the national level. The Korea Forest Service is taking the lead in green growth through the sustainable management and conservation of forest resources, as well as by promoting the use of forest biomass. By establishing AFoCO and implementing the Changwon Initiative, the Korea Forest Service is fulfilling its commitment to share Korea's experiences and knowledge with the international community. ♦



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