

**FOREST PATHWAYS THROUGH
NATIONAL REFORESTATION PROGRAMS AND
INNOVATIVE PUBLIC-PRIVATE FOREST INVESTMENTS
LESSONS FROM THE REPUBLIC OF KOREA**

FOREWORD

On behalf of the Secretariat for the Asian Forest Cooperation Organization (AFoCO), I would like to extend my sincere appreciation to the Food and Agriculture Organization of the United Nations (UN-FAO) for the opportunity to work together on AFoCO's first publication since its inauguration in April 2018.

I am delighted to publish this report on 'Forest Pathways Through National Reforestation Programs and Innovative Public-Private Forest Investments' as it fundamentally underpins the delivery of AFoCO's strategic goals. Recognizing that forests provide ecosystem services that are essential for human well-being and are at the forefront of reducing the effects of climate change, the Strategic Plan of AFoCO 2019-2023 highlights the organization's commitment towards 1) achieving the global goal of increasing forest cover up to 3% worldwide; 2) implementing the Paris Agreement on climate change; and 3) improving livelihood and income through forestry-related activities.

Despite the important role that forests play in communities, societies and countries, the world's forests and forest resources remain under threat from unsustainable forestry and agricultural practices. On the bright side, the international community has been trying to restore and reforest degraded forest ecosystems through various cooperative mechanisms at both the global and regional levels. The United Nations Strategic Plan for Forests (2017-2030) set a target of increasing forest area in the world by 3% by 2030 and includes a global objective of reversing forest cover loss through sustainable forest management practices such as restoration, afforestation and reforestation.

In the same vein, the Republic of Korea presents an excellent case that demonstrates how government-led forest policies can lead to forest transition. Following the severe degradation of forests during the Japanese occupation and the Korean war, forest cover in Korea constituted only 35% of the total land area in 1955. After the successful implementations of the First and Second 10-year Forest Rehabilitation Plans between 1973 and 1987, Korea is now covered with more than 60% of forested land. Korea's expertise in reforestation has been under global spotlight as it is the sole country that has achieved its reforestation goals together with economic growth over a short span of 20 years.

This report aims to help mobilize concrete and concerted efforts towards tackling deforestation and forest degradation by sharing the reforestation experiences and know-hows of Korea. By taking a closer look at the best practices and lessons learnt from Korea's reforestation efforts, developing countries around the world can better understand the value and potential contribution of public programs to development and poverty alleviation as well as the large scale restoration of ecosystems.

November, 2018

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Asian Forest Cooperation Organization (AFoCO) Secretariat



PREFACE

In early July 2017, I was asked by Mr. Patrick Durst of FAO to join as a national consultant of the Republic of Korea in preparing the next volume of the State of the World's Forests (SOFO-2018) publication. As part of the 2018 edition, FAO planned to feature case studies of countries that have actually achieved significant accomplishments in forestry. The TOR: Chapter 3 "How to make it work: Country experiences and lessons learned" will present and analyze case studies across the countries in the world highlighting diverse experiences in mainstreaming forest landscape values in a comprehensive, cross-sectoral and integrated approach to sustainable development.

While Korea's experience is not that "recent", it is still considered one of the most impressive large-scale transformations in the world and would therefore make a good case study to highlight. Patrick sensed that the "Korean miracle" in forestry is still evolving and there are probably plenty of recent developments that can be highlighted.

To accomplish this, I was introduced to Mr. Andrey Kushlin, Deputy Director of Forestry Policy and Resources, who is coordinating this part of the SOFO-2018 preparation. The original working title was "Forest Pathways to Sustainable Development: Benefitting Landscapes and Livelihoods" among participating countries. Thus, I and Dr. Kikang Bae prepared the Korea case study entitled "Forest Pathways through National Reforestation Programs and Innovative Public-Private Forest Investments" with the help of the Korea Forest Service and the Korea National Institute of Forest Science.

Eventually, the final title of Chapter 3 became "What Does it Take to Achieve the SDGs? Country Case Studies: Successes and Constraints" in SOFO-2018. The content for each of the country has been reduced. Thus, we asked the permission of the FAO to share our own experiences with other countries through a booklet. The printing of this booklet was permitted as all rights reserved under the FAO.

We much acknowledge those who have helped us in preparing the contents of the Korea case study, in particular the FAO. In addition, much appreciation is given to Dr. Marilyn S. Combalicer of the University of the Philippines Los Baños, Philippines for her English corrections. Hope this may be of great help to reforest degraded forest ecosystems in countries of which situations are similar to Korea before.

November, 2018

Don Koo Lee



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EXECUTIVE SUMMARY

Occupying 63% of the Republic of Korea (ROK) land, forests have been an important resource for Koreans as the people have continually relied on forests for fuel, food, construction material and ecosystem services. In the 1900s, severe forest degradation occurred due to massive timber exploitation during the Japanese occupation (1910-1945), land devastation during the Korean War (1950-1953), illegal logging, and unsustainable use of fuelwood. From 1943 to 1955, the stocked forest area reduced continuously and reached the lowest level in 1955, when forest cover constituted only 35% of the national land area. To attain national restoration goals, policy makers recognized reforestation as the first step. Thus, the government began a national reforestation program requiring large investments in terms of money, time and effort. Hence, nation-wide reforestation/rehabilitation of degraded forests was carried out through the First (1973-1978) and Second (1979-1987) National Forest Plans.



The case of ROK demonstrates that successful forest transition can be carried out in a relatively short period of time by a central authority, even with some flaws in the governance and low levels of economic development. The success factors of the national reforestation programs include: 1)

Political perspective: positioning of forest issues in the national mainstream and application of integrated approaches; 2) Social perspective: mobilization of people and their willingness to participate and encouraging investments on reforestation; and 3) Economic perspective: increased economic growth and changed in main energy sources from fuelwood to coal. Korea's successful reforestation experience can provide good practices and lessons learned to assist and guide reforestation endeavors in other developing countries. Based on Korea's experience, there is a need to: 1) understand and diagnose the causes of deforestation, 2) have an effective, strong and integrated approach to implementation, and 3) motivate people to participate in reforestation activities. Due to the success of reforestation efforts, the dense forests of Korea now provide public benefits of approximately USD 126 billion per year (about 9% of the GDP as of 2015). Since the completion of reforestation activities, Korea Forest Service (KFS) managed forests have been steadily providing environmental services to people based on sustainable forest management, while placing a focus on challenges in relation to the UN Sustainable Development Goals (SDGs) to share Korea's successful experience with other international communities.



1.1

FOREST TRANSITION IN ROK

1.2

INTRODUCTION, OVERALL STRATEGIES AND ACTIONS FOR NATIONAL REFORESTATION IN ROK

1.2.1

National forest rehabilitation efforts (1950s - 1987) in relation to governance

1.2.2

Sustainable forest management (SFM) in the context of the National Forest Plans (1988-2017)



1.1

FOREST TRANSITION IN ROK

The Government of the ROK has ever since designed a national strategy to improve the situation of the country. A rehabilitation policy that integrated forestry, rural development and community mobilization and elicited the active participation of the citizens was adopted (FAO, 2016). This includes the implementation of national campaigns and education programs on reforestation. Up to present, forestry has become a part of a national development plant. For instance, in 2011, a strategy to create a green society through its new national vision for the coming 60 years - “low carbon, green growth” was designed. The flow of forest policies to increase forest value in the context of the government’s vision was conceptualized and the role of the country’s forest sector, both nationally and internationally, in green growth was identified (Lee, 2012).

The people of ROK have relied heavily on forest resources to sustain their livelihood. Until 1950s, people used fuelwood as a major resource for cooking and household heating. For example, fuelwood accounted for about 90% of the ROK’s primary energy sources in 1950. Also, non-wood forest products (NWFPs), such as mushrooms and edible plants, are being gathered for food and income while timber is being collected for building materials. Therefore, as the people became dependent on forests for a living, forest degradation occurred. Reforestation and rehabilitation of degraded forests were initiated to provide wood fuels, household timber and erosion control but eventually restored forests became a source of other services, such as wildlife habitats and recreation and healing places for the people.

In 1900s, severe forest degradation had occurred due to massive timber exploitation during the Japanese occupation (1910-1945) and Korea experienced a period of chronic poverty and social

turmoil after liberation from the Japanese occupation. The occurrence of the Korean War (1950-1953) also devastated the remaining production facilities and transportation infrastructure, leaving Korea in a deep state of economic crisis. From 1943 to 1955, the stocked forest area reduced continuously and reached the lowest level when forest cover constituted only 35% of the national land area in 1955 (Bae et al., 2012). Subsequently, the ROK faced a timber shortage after its separation from the Democratic People’s Republic of Korea (DPRK) since it has 60% more population and 30% less forest areas. More than half of the forest area of the ROK was devastated while the demand for food and energy continued to increase significantly as population levels rose. This resulted in the widespread conversion of forestlands into agricultural lands as well as the excessive exploitation of fuel to obtain energy. As the ROK is a mountainous country, the destruction of erosion facilities led to heavy rainfalls during rainy seasons in July and August, causing secondary damage. Frequent droughts and floods occurred every year, leading to loss of agricultural productivity, destruction of roads, damage to industrial and housing facilities and even human casualties.

Consequently, the government and the people realized that the rehabilitation of degraded forests is a crucial means to improving livelihoods. The Saemaul Undong or Saemaul Movement (a national campaign involving of new villages working together with the spirits of diligence, self-help and cooperation) was launched as a political initiative on April 22, 1970, and the rehabilitation of degraded forests was one of Saemaul Undong’s main activities. After successful reforestation

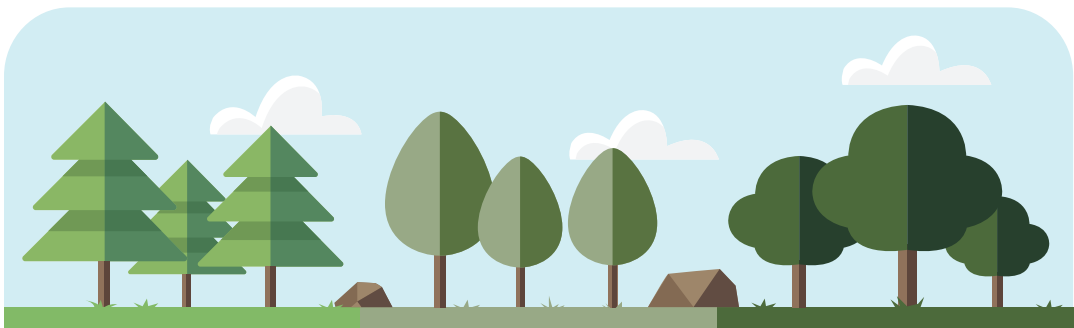
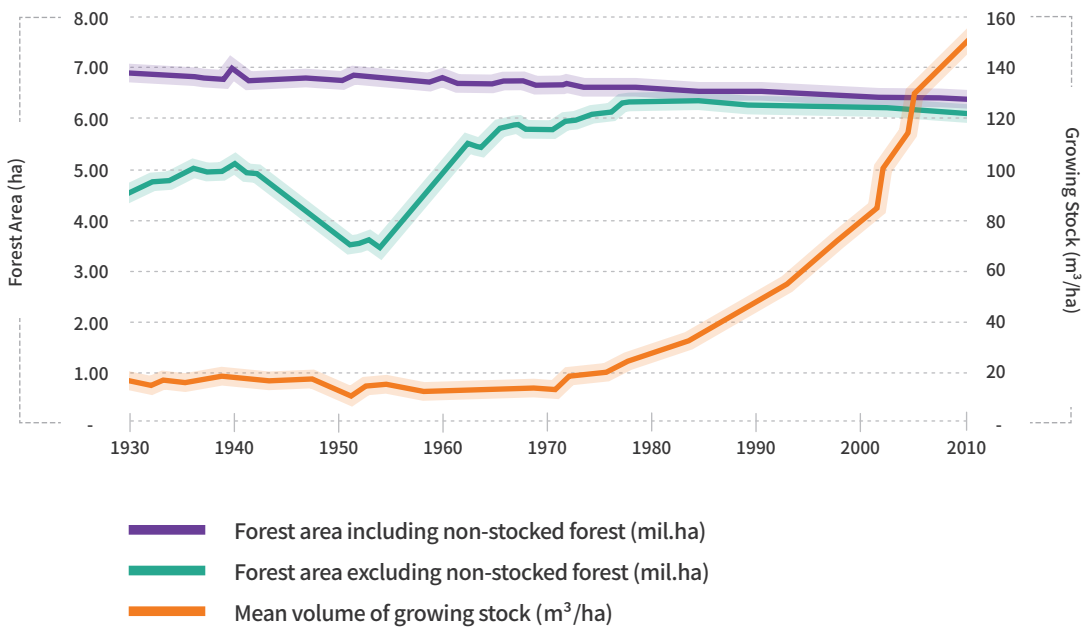




implementations with the planting of 12 billion trees on 4.25 million ha of forest land across the nation, the ROK transformed itself from a poor, forest-degraded country into an economically developed, thickly forested country (Figure 1). Compared to a gross domestic product (GDP) per capita that was less than USD 100 per capita until 1962, the GDP increased to USD 3,512 in 1987 when the national reforestation was completed and to USD 27,097 in 2015 (Statistics Korea, 2017).

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, create new growth engines through investment in environmental sectors, including forests, and to develop an ecological infrastructure (Lee, 2012).

Figure 1
Change in forest area and mean volume of growing stock (Bae *et al.*, 2012)



1.2 INTRODUCTION, OVERALL STRATEGIES AND ACTIONS FOR NATIONAL REFORESTATION IN ROK

1.2.1

National forest rehabilitation efforts (1950s-1987) in relation to governance

The extreme diminished state of forests in the aftermath of the Japanese occupation and the Korean War remained a huge obstacle in achieving restoration goals (Photo 1). Recognizing the need for forest rehabilitation and stronger forest policies, the Forest Law was enacted in 1961 to promote the protection and development of forests as well as to enhance forest productivity. Hence, the reforestation project was included into the First 5-Year Economic Development Plan (1962-1966). Furthermore, to ensure the effectiveness and efficiency of forest policies, the Korea Forest Service (KFS) was established as a national forest administration agency under the Ministry of Agriculture and Forestry (MAF) in 1967 (Photo 2). Under the newly formed KFS, the Second 5-Year Economic Plan (1967-1971) encompassed more extensive forest policies covering issues such as reforestation, forest protection and the promotion of forest industries. Contrary to the government's efforts on reforestation, the First and Second 5-Year Economic Development Plans prioritized the development of

building infrastructure and hence, the lowly prioritized forest rehabilitation projects did not achieve the expected results. Upon witnessing this, President Park Chung-Hee (former President in 1963–1979) repositioned the KFS under the Ministry of Home Affairs (MOHA), giving it more authority to initiate and lead forest rehabilitation projects (Photo 2). Subsequently, the Korean government launched the First and Second 10-year National Forest Plans in 1973 and 1979. The overall aims of the Plans were to restore 39% of the total degraded forest land in the country, which is equivalent to 2,637,000 ha of forests. The First 10-Year National Forest Plan aimed to restore 1 million ha of forests, while the Second 10-Year National Forest Plan intended to restore the remaining amount. Although the First 10-Year National Forest Plan was scheduled for implementation over a span of 10 years, it was completed within just six years (1973-1978). Similarly, the Second 10-Year National Forest Plan was completed a year earlier than planned (1979-1987).

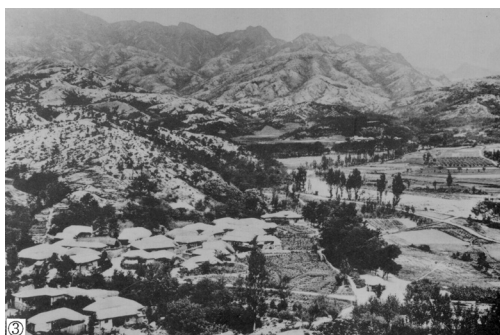


Photo 1 Degraded forests during 1950s - 1960s



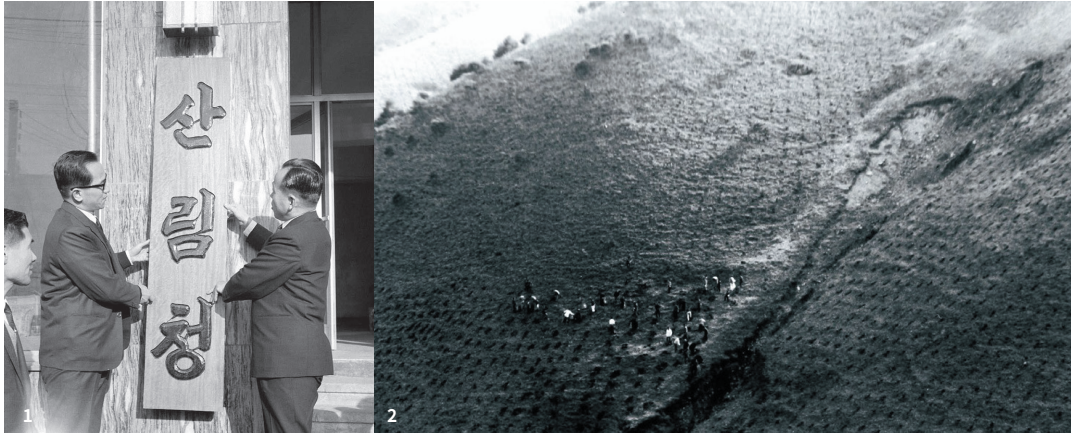


Photo 2 Establishment of the Korea Forest Service in 1967, (1) / and large-scale forest plantation in Boseong, Jeonnam province in 1969 (2)



Photo 3 Rehabilitation of eroded land in Yeongil district

1.2.2

Sustainable forest management (SFM) in the context of the National Forest Plans (1988-2017)

Building on the foundation of the First and Second National Forest Plans, which focused mainly on the re-greening of deforested areas, the subsequent decadal plans established by the KFS were dedicated towards sustainable forest management (SFM). The Third National Forest Plan: Forest Resources Development Project (1988-1997) aimed to build a foundation for sustaining forest land resources through harmonizing economic functions and public benefits of the forests based on forest rehabilitation. The Plan was in response to the country's dependence on imported wood, (which accounted for 90% of the domestic demand) and increased demand for outdoor recreation and environmental conservation. During this period, 0.32 million ha of commercial forests were established and the tending project covering 3.03 million ha was conducted. Also, the Act on Promotion of Forestry and Mountain Village was enacted (1997), forest recreation facilities were expanded, and a forest land utilization system was set up.

In 1998, the Fourth National Forest Plan (1998-2007) signaled the start of a transitional phase in forest policy. The Fourth Plan shifted its main focus from economic functions to enhancing the various benefits provided by forests and pursued the further refinement of policies and objectives for SFM. In the year 2000, the KFS announced 'The 21st Century Forest Vision', which served as the guiding principle where humans and forests can coexist. The objectives set out under the vision included the creation of ecologically healthy and sustainable forest resources, the development of a forest industry which gives hope to foresters and contributes to the national economy, and the promotion of a forest environment that enables a pleasant and eco-friendly life. Later, the Fifth National

Forest Plan (2008-2017) was to realize the goal of SFM nationwide in pursuit of maximizing forest functions. The Fifth Plan highlights the importance of forest functions in responding to climate change. It further stresses forests' recreational and cultural functions for improving quality of life and living environments both in urban areas and mountain villages, providing welfare benefits for the people, and pursuing forest-related industries such as the blue ocean strategy. Furthermore, ROK has been actively participating in international forest programs and negotiations, such as the United Nations Forum on Forests (UNFF), the United Nations Convention to Combat Desertification (UNCCD), the United Nations Convention on Biodiversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), and implemented forestry cooperation projects through partaking in bilateral forest-related initiatives with 31 countries in 2016 as well as the establishment of the Asian Forest Cooperation Organization (AFoCO) as an international organization. Through AFoCO, the 10 ASEAN Member States, Mongolia, Bhutan, East Timor and Kazakhstan collaborate and share experiences with the international community. The themes and major policies of the First to Fifth National Forest Plans are summarized in Figure 2.





► **Figure 2** Summary of 1st - 5th National Forest Plans

| 1st and 2nd NFP 1973~1987 | 3rd and 4th NFP 1988~2007 | 5th NFP 2008~2017 |
|---|---|---|
| <div data-bbox="285 491 360 574" data-label="Image"> </div> <p data-bbox="179 586 454 611">Forest Rehabilitation Project</p> <ul data-bbox="179 635 440 893" style="list-style-type: none"> • Successful rehabilitation in 2.1million ha of degraded forests • National Planting Campaign in March and April • Creation of fuel production forests for rural and mountain villagers as an energy source • Erosion control to prevent natural disasters | <div data-bbox="646 491 742 574" data-label="Image"> </div> <p data-bbox="529 586 760 658">3rd (1988~1997) Development of Various Forest Values</p> <p data-bbox="529 684 831 756">4th (1998~2007) Building a Framework for Sustainable Forest Management</p> <ul data-bbox="529 782 814 1060" style="list-style-type: none"> • Creating commercial plantations and tending forests • Forest road construction and education and training programs for regional foresters • Introduction of SFM as a principle in forest policies and activities • Harmonizing various forest values: ecosystem, environment, recreation, urban forests, etc. | <div data-bbox="1009 491 1092 574" data-label="Image"> </div> <p data-bbox="909 586 1192 611">Forests Leading Green Growth</p> <ul data-bbox="902 635 1195 809" style="list-style-type: none"> • Construction of system for expanding Forest Welfare Service • Construction of system for forest carbon stocks management in response to climate change • International cooperation in forestry |



2.1

POLITICAL PERSPECTIVES

2.1.1

Positioning forest issues in the mainstream

2.1.2

Inter-sectoral cooperation

2.1.3

Policies and laws

2.2

SOCIAL PERSPECTIVES

2.2.1

National campaign and education on reforestation

2.2.2

People's willingness to participate and invest in reforestation

2.3

ECONOMIC PERSPECTIVES

2.3.1

Increased economic growth

2.3.2

Emergence of alternative energy sources
(change in use of fuelwood to coal)

2.3.3

Migration of rural population into urban areas

2.4

DISADVANTAGES OF LARGE-SCALE REFORESTATION



2.1 POLITICAL PERSPECTIVES

2.1.1 Positioning forest issues in the mainstream

■ Forest rehabilitation as a top priority under a national development strategy

Following the establishment of the KFS in 1967, and for 5 - 6 years after its establishment, reforestation was just a second priority next to economic growth. With this, the government approved the revised National Government Organization Act on February 23, 1973, and transferred KFS from the MAF to the Ministry of Home Affairs (MOHA). The reorganization, in the policy-making process, led to the prioritization of forest rehabilitation. This was because President Park Chung-Hee considered Saemaul Movement, also known as Saemaul Undong, to be the most important national project. The Movement was led by MOHA, wherein the KFS became part of. The KFS established a system for conducting forest rehabilitation projects intensively in connection with the Saemaul Movement. This served as a catalyst for moving forest rehabilitation projects forward. In particular, the First National Forest Plan was included in the 5-Year Economic Development Plan and received substantial budget allocations for successful implementation.

A change was brought about in the implementation of the policy. After its transfer to MOHA, KFS was able to utilize financial support from local administrative and police organizations, thereby reinforcing policies, such as the promotion of investments in forests and forest protection. As MOHA was in charge of the Saemaul Movement, local administration, and policy administration, the KFS was able to implement more comprehensive forest-related work. The KFS now had more authority than when it was still a part of the MAF. Under the MAF, provincial-level governors, mayors,

and county governors led forest management. Police superintendents directed forest protection while forest service officials gave technical instructions. In terms of forest policy, this indicated a shift in focus from the promotion of the forest industries to forest protection. Thus, the KFS was given more support to achieve the quantitative goal of developing a 1 million ha plantation during the First National Forest Plan and was able to build a platform to develop forest administration in line with national policy.

■ Government budget for reforestation

Until 1966, before KFS was founded, the Korean government provided financial resources for forest rehabilitation mainly in the form of direct investment and subsidies from local governments and the private sector as the forestry department was one of the small bureaus under the MAF. However, since the annual provision of funding was not stable and funds were not provided as planned, especially in the 1950s, forest-related projects were not successfully implemented.

It was only after the establishment of KFS as an independent organization under the MAF that the budget for various activities and projects was expanded. The budget for forest projects was assigned to plantations, erosion control work, forest protection (Box 1), forestry pilot research, special forest products, and other forest-related activities. When the KFS was established in 1967, the budget for forest rehabilitation amounted to 2.1 billion Korean Won (USD 1.00 = KRW 255),



which accounted for 0.7% of the entire government budget. The budget since then increased steadily and reached KRW 6.3 billion in 1972, which was three times larger than the period when the KFS was established. The increased budget was mainly due to the financial support on special account (management of public forest land, financial management, and special account for economic development).

In 1973, when the First National Forest Plan was initiated, forest-related budget exceeded KRW 10 billion and occupied over 1% of the government budget. The growth continued and the budget

increased 2.7 times during the period of the First Plan (from KRW 10.2 billion in 1973 to KRW 27.3 billion in 1979). Although the proportion of forest-related budget in the entire government budget was reduced to 0.3-0.5% during the period of the Second National Forest Plan, the total amount rose 1.8 times from KRW 34 billion to KRW 62.3 billion. In light of this, the key to the success of forest rehabilitation projects lies in the significant increase in the forest-related government budget since 1972. This budget increase provided more support for the implementation of forest rehabilitation projects, such as large-scale plantations, erosion control work, and development of nurseries.



BOX 1**National Slash-and-Burn Clearance Project**

One of the biggest successes of the forest protection project during the First National Forest Plan was the implementation of the National Slash-and-Burn Clearance Project (Photo 3). Slash-and-burn agriculture was a deep-seated problem with around 300,000 households (1.8-2 mil. people, 6-7% of the total population) practicing slash-and-burn agriculture covering 126,000 ha in the early 1970s. Since slash-and-burn agriculture degraded forest lands seriously by burning trees and damaging soil structures, the government spent budget to eradicate slash-and-burn, especially for implementing rehabilitation/reforestation, but failed continuously.

After several failures the government's bold investment after the introduction of the 5-year Slash-and-Burn Clearance Plan (1974-1978) made the project a great success in just a very short span of time. In 1974, the government's budget had risen to 25 times that of 1960's, securing sufficient budget for the project. The key success factor was that the National Slash-and-Burn Clearance Project focused on establishing settlement and job creation measures in farming areas (69.9%), a fundamental cause of slash-and-burn, rather than implementing rehabilitation/reforestation projects (22.8%), thereby reducing dependence on forests.



1



2

Photo 4 Slash-and-burn farmers (1) Migrating into a new settlement (2)



2.1.2 Inter-sectoral cooperation

■ Inter-sectoral cooperation

All relevant sectors worked together towards the same goal of reforestation and the activities were integrated with several government programs. President Park Chung-Hee realized that cooperation among different government sectors was essentially strengthened for the effective implementation of the reforestation programs; hence cabinet meetings were initiated for inter-ministerial coordination. In this regard, reforestation was implemented in line with major government policies, such as the 5-Year Economic Development Plans (1962-1976) and the 10-Year National Comprehensive Development Plans (1972-present) and became the top priority in policy decisions.

In January 1973, the President announced the First National Forest Plan (1973-1982) and started to implement transformative forest policies. In particular, the president was determined to link the Saemaul Movement with the National Reforestation Program for efficient and successful implementation. The Saemaul Movement played an important role in the nationwide reforestation work as planting

trees on the rugged mountains in the ROK was a difficult task requiring the participation of the local people. Based on the concepts of diligence, self-help and cooperation, Saemaul Movement soon became a nationwide movement with active support from the government, and it expanded from an agricultural development project to a modernization movement of Korean society as a whole.

The nationwide tree planting movement, implemented by MOHA, was conducted in cooperation with various government divisions (Box 2). Private sector stakeholders, such as forestry organizations and the National Forestry Cooperative Federation, also participated actively in the government's reforestation programs by building plantations and providing technical training for mountain owners. After tree plantations, the government also aligned the administrative power of the central government in order to provide strong regulation and enforcement on forest protection, which could not be handled by the KFS alone.

BOX 2

Ministries and their responsibilities during the nationwide tree planting movement

| Ministry / Division | Responsibilities |
|--------------------------------------|--|
| Ministry of Agriculture and Forestry | Supply fertilizers for the timely implementation of planting activities |
| Ministry of Culture and Information | Promote the national reforestation campaign |
| Ministry of Defense | Provide transportation equipment and labor force required for tree planting |
| Ministry of Education | Develop the student tree planting campaign |
| Ministry of Transportation | Manage reforestation activities along expressways and railroads |
| Local governments | Oversee reforestation planning in each city and village |
| Related divisions | Encourage the participation of related organizations and agencies in the planting campaign |

2.1.3 Policies and laws

The reforestation policy of ROK is one of the most successful cases worldwide. This is because the government regulation system on forest preservation and usage is well supported and the regulation policy was quite effective.

In order to prevent forest destruction and degradation, even during the Korean War (1950-1953), the government established and proclaimed Temporary Measures for Forest Protection Law (1951). Also there were efforts to strengthen the Forest Police Duty (1952). In 1961, the Forest Law was established and through this, the existing temporary Acts were organized. Also, there were several regulations for encouraging reforestation and forest protection, such as Act on the Control of Forest Resources (1961), Erosion Control Act (1962), and Abolishment of Slash-and-Burn Fields Act (1966). Not only that, the Act on Arrangement of Special Employees for Forest Protection (1963) was enacted and this encouraged people to participate in reforestation activities. Although the Act was based on voluntary contribution of the people, if necessary, the government could force people to work for the reforestation. This kind of labor was called forest-kye, and it eventually became mandatory labor for government

employees, students and employees of public organizations.

Moreover, the government used administrative guidance and cooperative policy in order to reach its reforestation goals. This administrative guidance and cooperative policy refers to the middle point between legal enforcement and public enlightenment. At that time, the government used to apply the administrative guidance and cooperative policy to cover manpower shortage when promoting nationwide businesses, and the method was also used to actively promote and support various organizations, as well as to authorize and launch business trades. To complete the reforestation task, the National Forestry Cooperative, as a representative organization, made efforts to increase participation in reforestation activities among residents, making the policy more understandable. The cooperative also organized programs to educate the public on tree species selection and impart technical skills related to tree planting and management. Also, the government mobilized ordinary people to prevent illegal logging, slash-and-burn, forest fires, and forest insects and diseases through proactive management.



Photo 5 National tree plantation campaign, poster (1) and its banner at central park of Seoul (2)



2.2 SOCIAL PERSPECTIVES

2.2.1

National campaign and education on reforestation

To achieve the goal of reforesting 2.6 million ha of degraded forest land when the First and Second Plans were being implemented, the ROK government spearheaded a powerful and active promotional campaign to encourage people to participate in the National Reforestation Program. The ‘Tree-planting system by all people’ was adopted as a core implementation tool and the campaign mobilized all members of the society, as it required the participation of both direct and indirect stakeholders in reforestation activities to achieve the national goal. For example, public occasions, like Arbor Day (April 5), were declared to promote reforestation activities among the public. Organized by the KFS, Arbor Day was a national event that mobilized millions of people, including soldiers and students. The image of President Park Chung-Hee planting trees also served as a visual promotion to show his

strong commitment towards forest restoration. Back then, half of the trees required to meet plantation target for the year was planted on Arbor Day. The government also designated the Nationwide Tree-planting Month (March 21 to April 20) and the National Tree-tending Day (first Saturday of every November), and the entire nation was involved in tree planting and tending activities. The national tree planting campaign and education on reforestation was emphasized and publicized through the media (Photo 5). In 1974, for instance, around 0.78 million individuals participated in local seminars on national forest conservation and a total of 1,024 promotions were made via newspapers and media broadcasts. Due to consistent promotional activities since the First National Forest Plan, tree planting became deeply rooted in Korean society.



Photo 6 Tree planting by police officers (1) and students (2)



2.2.2

People's willingness to participate and invest in reforestation

The forest-kye (sanlim-kye; mutual aid association in villages) is familiar to residents of mountain villages since it was set up in the Chosun Dynasty (1392-1910). In order to establish large-scale plantations to address the fuel crisis in rural areas, the government enacted the Forest Law in 1961, including the forest-kye and National Forestry Cooperative, and made them involved in the reforestation projects as a matter of duty. Forest-kye played a pivotal role in creating a 363,000 ha fuelwood forest plantation just after the KFS was established in 1967. This was also the largest plantation created since the government took office. Also, the Saemaul forest-kye (actually the same association as forest-kye), was established in 1973, and actively participated in the tree plantation to meet the goal of reforesting 1 million ha of land during the First National Forest Plan. Such large-scale plantation would not have been possible without the participation of the people. The government also provided benefits to them to incentivise and encourage participation.

A. Planting trees for fuelwood in village forests

Up till the 1960s, most people relied on fuelwood for cooking and heating, and forests were degraded due to the collection and sale of fuelwood. The government realized that reforestation would be impossible if the fuel crisis is not addressed. Hence, the government only allowed families who were part of the forest-kye and participated in plantation and forest preservation activities, to extract fuelwood in designated village forests. To ensure the sustainable use of village forests, the village even allocated funds to each family for the maintenance of the forests and issued regulations to decide on the annual plantation and harvest amounts.

B. "Wheat flour" to sustain erosion control project

Without the active participation of the villagers, erosion control projects would never be completed. Immediately after the Korean War, the entire nation was facing a severe food crisis and many people survived on herb roots or tree barks. With funding from the United Nations and the United States of America, flour was distributed as a U.S. PL480 relief food to residents of villages who participated in erosion control work. As food was scarce, people had to queue up in long lines to participate in erosion control work in order to obtain a bowl of flour in return. Hence, erosion control was widely known as 'Flour Erosion Control'. The World Food Programme also supplied wheat/cereals in the erosion control project known as the three-river valley development till 1971.

C. Income generation projects through Saemaul Movement

The First National Forest Plan focused on three main concepts to increase rural income: the plantation of fast-growing trees, tree planting system by all people, and tree planting system for economic development. The income generation through tree planting system for economic development further boosted participation of farmers. One good example among the tree planting systems for economic development is the 'Saemaul nursery'.

To cope with the sudden and sharp increase in the demand for seedlings to meet the reforestation target of 1 million ha in the First National Forest Plan, the government introduced a program known as the Saemaul nursery (Photo 7). Through this program, villages started the Saemaul nursery project and the government provided the necessary support and subsidies, such as: 1) an initial loan of zero interest for the establishment of a nursery, 2) seedlings, fertilizers and containers, and 3) transportation means for the seedlings and fertilizers. Afterwards, the government purchased all the seedlings produced from the nursery at the market price, thereby guaranteeing income for the village. This program represented a win-win situation for both the government and the villages. The seedlings obtained from Saemaul nursery projects constituted 34.8% (9.4 million) of the total seedlings produced during the First National Forest Rehabilitation Plan.



During the First and Second Plans, income from the Saemaul nursery projects amounted to USD 15.4 million, which was about USD 474 per village (Lee, 2012). Not only that, the income from the projects was doubled by the ‘Compound Income Projects’. The villagers kept half of the income while

the other half was allocated for the village fund for investments and other profit-making projects of the Saemaul Movement in the village. This allowed villages to implement other projects and continue to generate income.



Photo 7 Saemaul nursery (1) and chestnut production (2) for income generation

D. Planting fruit trees/cultivating mushrooms/collecting medicinal herbs for short-term income

In the past, there was an abundance of herbs, edible plants and mushrooms, and they were a common source of food for rural communities. Between the 1950s and the 1960s, the forests of the ROK were severely degraded and the densely forested mountains were reduced to bare land. People could no longer obtain forest resources, such as materials and food.

The planting of trees through reforestation activities created forests and over time, the number of edible plants, mushrooms and herbs increased. People were

able to harvest and obtain financial income from the sale of these products. Especially, chestnuts were known as the most important crop in forestry and a staple food source for the people. Chestnuts also bring about the largest amount of profits in the income-boosting forest projects under the Saemaul Movement (Photo 7). The chestnut became one of the Korea’s main export items and in 1987, when the Second National Forest Plan was concluded, chestnuts generated 78% of the total income from non-wood forest products (NWFPs). These incentives made the establishment of chestnut plantations a popular activity favored by rural communities.



Regardless of the benefits mentioned above, there were outstanding individuals and corporations committed to planting trees only for the re-greening of Korea. These individuals and corporations looked beyond earning profits in the short term and even invested in the planting of trees. In return, they receive special favors from the government and become more motivated to dedicate more efforts towards reforestation activities. One example of such an individual is Mr. Im Jong-guk (Box 3), who had planted 2.79 million trees on 800 ha with his own personal expenses. President Park Chung-Hee recognized his work and allowed him to attend a monthly briefing to the President on economic affairs. According to a recorded transcript of the briefing, Mr. Im attended the briefing and discussed about forestry issues with the President and the Minister of KFS.

Since 1968, in order to honor individuals and corporations who contributed to the improvement of the state of forests, the KFS designated them as 'Sincere Forest Managers'. 'Sincere Forest Managers' are classified into three categories (Exemplary, Excellent and Self-Supporting Forest Managers) depending on the scale of the forests owned. Once designated as a 'Sincere Forest Manager', an individual or corporation would be given various benefits – permits to fell (cut down) damaged trees, the autonomous right to conduct projects based on forest management plans, priority rights to receive technological guidance, loans and subsidies, and priority rights granted in the planning process of the profit sharing of national forests.

BOX 3

Sincere Forest Managers

Im Jong-guk (1915-1987) dedicated his life to reforestation, planting more than 2.79 million trees over 800 ha of land at his own expenses.

Im Jong-guk encountered countless obstacles and setbacks, but he never gave up. The establishment of evergreen forests of Hinoki cypresses and Japanese cedar on Mt. Chukryong was the life's work of Im Jong-guk and his forests have been well-loved and appreciated by the public.

Nowadays, Mt. Chukryong is widely known as a healing forest because of the healthy phytoncides emitted by cypresses, which have soothing and relaxation effects.

SK Forest Co., Ltd – Chey Jong-hyun (1929-1998) became the first entrepreneur to be listed in the Forest Hall of Fame for his lifetime contribution to afforestation. Back in the 1970s, securing budgets for planting activities was a difficult task. Under Chairman Chey's leadership, SK Forest was designated as a corporate 'Sincere Forest Manager' and eventually grew to become the ROK's only forestry enterprise with more than 40 years of history.

SK Forest has reforested around 4,000 ha of land with 3 million trees and contributed greatly in the development of the silviculture and forest resources industry.



2.3 ECONOMIC PERSPECTIVES

2.3.1

Increased economic growth

The success of the 5-Year Economic Development Plan after 1962 resulted in a continuous and rapid growth of Korea's economy. The GDP at the beginning of the First National Forest Plan in 1973 was 11 times greater than that in 1953. By the time the Second National Forest Plan was completed in 1987, it was 108 times of that in 1953. This massive

economic growth made the transition from fuelwood to fossil fuel consumption in households possible as people became more affluent and were able to purchase briquettes or gas to meet their energy needs instead of collecting fuelwood, which is a labor-intensive task.

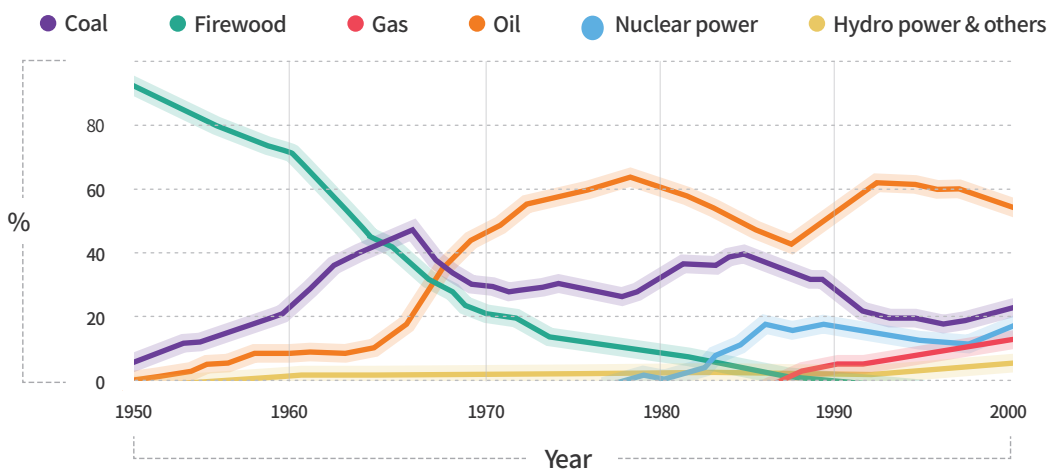
2.3.2

Emergence of alternative energy sources (change in use of fuelwood to coal)

The most direct and significant driver of forest degradation was the use of fuelwood. Although massive tree planting activities were being implemented, the consumption rate of fuelwood was faster than the planting rate in 1955, considering that all trees would disappear in a decade. In 1973, the amount of forest fuel collected peaked at 7.44

million tons and gradually decreased over time till 1979 (Figure 3). Improvements in fireplaces during the Saemaul Movement as well as the expansion and enhancement of roads and coal railroad lines, such as Yeongam and Taebaek railroad lines that lead to rural areas, resulted in the introduction of other modernized fuels like coal, briquette, petroleum and diesel as well as a reduction in forest fuel demand.

Figure 3 Changes in primary energy consumption (Bae *et al.*, 2012)



2.3.3

Migration of rural population into urban areas

The population of the ROK had been increasing steadily and urbanization accelerated in the 1960s due to rapid economic growth and industrialization. Since people in rural areas are more dependent on forest fuels than those in urban areas, the urban migration of rural populations had a positive impact on the status of reforestation in the country. The result of this increasing urbanization led to a significant increase in the country's urban population from 24% in 1955 to 54% in 1970 and then to 94% in 2010.

2.4

DISADVANTAGES OF LARGE-SCALE REFORESTATION

Reforestation in the 1970s has resulted in a remarkable transformation in the landscape of the ROK within a comparatively short time. The First National Forest Plan was widely successful and resulted in the planting of trees over 1.08 million ha of land in a span of five years. Consequently, this large-scale mass plantation of a single tree species within a short period of time resulted in several underlying problems.

A. Tight control by the government

The reforestation project in the 1970s was completed ahead of schedule under the supervision and control of the government. The government set reforestation goals for the country and the people were instructed to participate in reforestation activities in order to achieve these goals. In order to accomplish the goals set out in the First and Second National Forest Plans, reforestation had to be conducted throughout the entire country and the government's decisions overpowered the opinions of the landowners. Although it was important to consider other factors, such as sustainable forest management, suitable tree species, soil properties and means of generating income from forest products, the government focused on the planting of large numbers of trees in the shortest time possible. The opinions and needs of private forest owners, who then owned about 80% of the forest lands in the ROK, were mostly ignored and 70% of them ended up following the government's instructions.

The government-led, large-scale reforestation projects that ignored the needs and concerns of private forest

owners led to the lack of ownership in private forest lands up till today. To solve this problem, the KFS tried to educate and encourage private forest owners to participate in reforestation, but it has not been successful. In this regard, the KFS established a Public Land Management Plan (2009-2050) with the aim of acquiring more private land to ensure that the government sustainably manages the ROK'S forests and forest resources. The KFS aims to purchase private land from landowners to increase the proportion of national forests from 26% (in 2016) to 32% by 2030.

B. Low survival rate of seedlings in forest nurseries

To achieve reforestation goals, it was essential to produce large quantities of seedlings. Many farmers in the Village Forestry Cooperatives (Forest-kye) had to produce seedlings on their rice paddies even though rice paddies were unsuitable for seedling growth (Box 4). As a result, many seedlings did not survive and died when they were planted in mountain sites.



BOX 4

Initial failure of the Saemaul nursery project

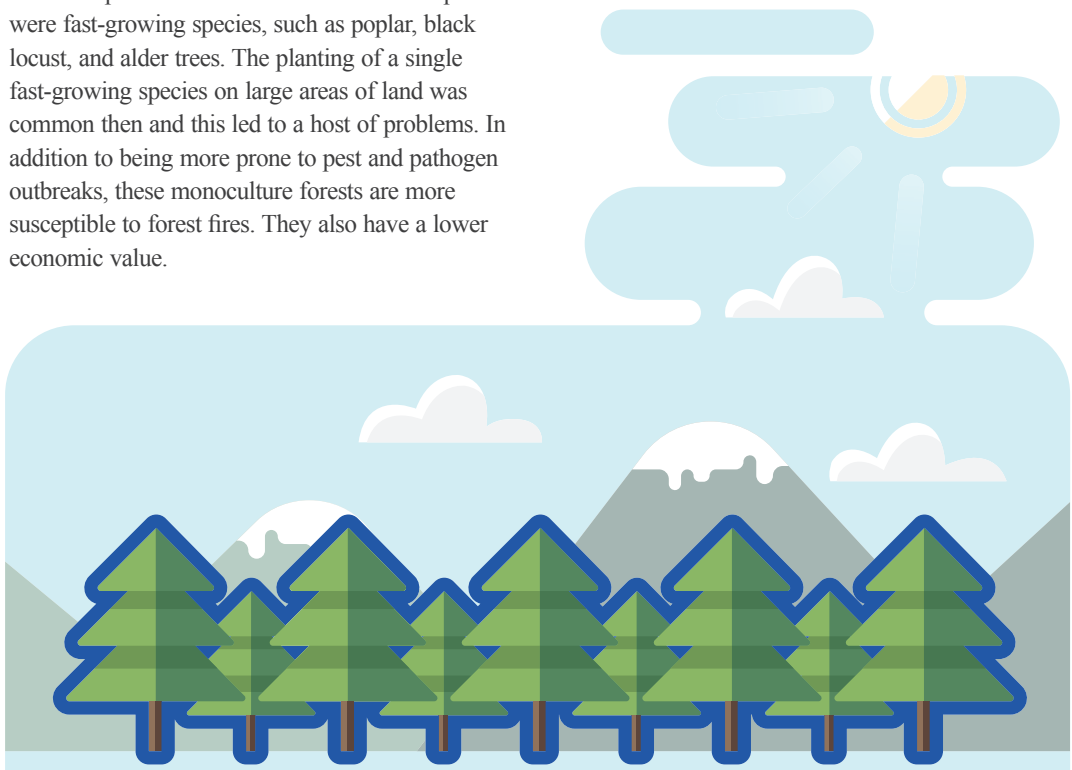
During the first year of implementation of the Saemaul nursery project in 1973, the government's original plan was to produce 140 million trees from village nurseries with the participation of 14,255 villagers. However, the final number of trees produced was 86 million and accounted for only 61% of the expected production number. Although this was a pioneer project of its kind and problems were unavoidable, the failure of the project in its first year was chiefly attributed to the villagers' lack of knowledge of nursery techniques and related experience. Other reasons cited included the inappropriate selection of nursery sites, the dispersion of many small nurseries across the country as well as the lack of proper supervision and management.

Taking into account these issues and lessons learnt, the new plan in 1974 included a reduction in the number of villages (5,000) and an increase in the number of seedlings to be produced (227 million trees).

Instead of planting several tree species, the concentration was on the planting of a few selected tree species. Technical supervisors were also dispatched to each village to guide the villagers working in the nurseries. The result of these changes was the production of 193 million seedlings, which was 85% of the original goal. In 1975, the Saemaul nursery project continued its success and 90% of the target number of seedlings were produced.

C. Improper selection of tree species

The tree species selected in the reforestation plans were fast-growing species, such as poplar, black locust, and alder trees. The planting of a single fast-growing species on large areas of land was common then and this led to a host of problems. In addition to being more prone to pest and pathogen outbreaks, these monoculture forests are more susceptible to forest fires. They also have a lower economic value.



3.1

KEY CONTRIBUTING FACTORS OF REFORESTATION AND LESSONS LEARNT

3.2

BENEFITS OBTAINED FROM REFORESTATION AND CURRENT ISSUES



3.1 KEY CONTRIBUTING FACTORS OF REFORESTATION AND LESSONS LEARNT

After the successful reforestation, throughout the following half century, the government has been putting much effort into keeping the country green despite numerous natural changes in the country's landscape. As a result, the forest growing stock increased by 26 times, and amount of forest resources saw a 14-fold increase. The ROK is the only country that has succeeded in both nation-wide reforestation and economic growth since the 20th century. The ROK is also the only country that has changed from a country that receives aid into a country that actually provides aid. This has led to worldwide interest in the country's forestry and environmental field, which presents many opportunities to share about its successful experiences in reforestation.

■ Reforestation as a top priority policy

At the time when the economic situation of the ROK was unfavorable and governance was weak, strong leadership was necessary to implement the reforestation activities. Recognizing this, the President set reforestation as its number one priority, and with the government's guidance and the people's active participation, the problem of forest protection was solved. To achieve the goal of reforesting extensive areas of bare forest land in a short period of time, the top priority government Plans (5-Year Economic Development Plan, National Comprehensive Development Plan, and Saemaul Movement Plan) were interlinked to increase the effect of the new policy. A huge budget was set aside for reforestation and the government initiated activities such as the cultivation of seedlings, planting of trees and protecting planting areas from illegal logging and slash-and-burn practices. In addition, through the provision of technical support for reforestation activities, the entire nation was mobilized to participate in the greening of the country. Reforestation was not simply a goal of the government, it was perceived and dealt with as a problem that needed to be solved. What made this policy successful was the fact that all means possible were used to realize the policy goals.

■ Reforestation as a solution to the country's problem

The government had to make a self-assessment of the status of forest ownership in the country to solve the problem of reforestation. By doing so, there was a high potential for developing a comprehensive countermeasure for better understanding. In 1960s, the government's main interest was in ensuring economic growth and this was the same policy direction that other developing countries had taken. To lay the foundation for economic growth however, the ROK had already made the 5-Year Economic Development Plan, which includes an aspect on forest management. This led to the conclusion that the ROK, which consists of over 60% of forested land, cannot achieve economic growth if damages from repeatedly occurring droughts and floods are being neglected. To deal with this problem, after the Korean War, the government utilized the reconstruction loan from the International Bank for Reconstruction and Development (IBRD) and actively engaged in reforestation, which became a worldwide issue as well.

Another thing the government did was to figure out the direct reasons for the forest loss. These turned out to be fuelwood consumption, illegal logging for food and income, and slash-and-burn land use. To solve this completely, a realistic and innovative policy was undertaken and carried out. Along with economic growth, the problem was solved very quickly. At that time, the ROK was one of the poorest countries with weak governance, but as people started developing a sense of ownership for forests, they also became more enthusiastic and passionate in dealing with forest-related problems.



■ Setting a strategic goal

Without the active participation of the people, reforestation and cultivation on a national scale would not have been possible. Until 1960s, most of the people used fuelwood as a daily necessity, so the policy of forbidding cutting firewood simply for forest protection had to face inevitable failure.

To solve the situation, the government introduced a very specific and practical goal. The entire nation was persuaded and there was an enthusiastic reaction towards reforestation initiatives. In 1972, according to a scientific survey on fuelwood, 2.8 million families, about half of the nation's population were using forest fuel for farm consumption. The annual fuel consumption was 4.2 tons per household and the total annual fuel consumption amounted to 1,173 million tons.

The government proceeded with a research on fuel production forests and realized the need for reforestation. In 1973, the 1 million ha afforestation goal was reached and the National Forest Plan was established. Also, the “national long-range plan with an emphasis on forestation management” was promoted as a logo that encouraged the citizens to cooperate. The country takes pride in having good forestation management practices, happiness and prosperity, hence, leaving a valuable legacy for the next generation. The appeal for patriotism triggered nationwide participation not only by the government and forest land owners, but also by ordinary citizens.



Photo 8 Citizens in a recreational forest



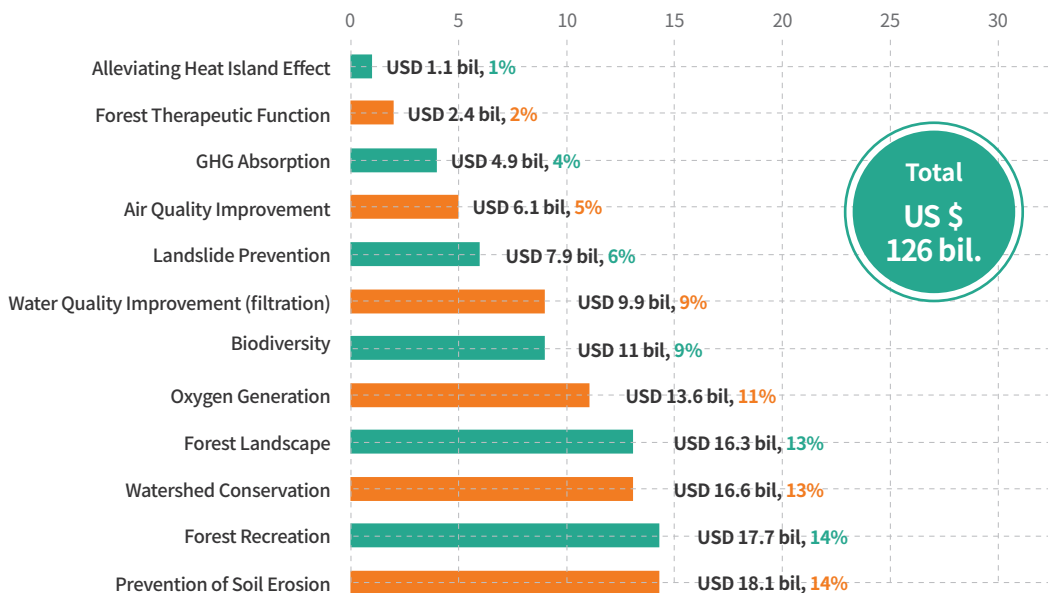
Photo 9 People of all ages enjoy nature in Korea's rehabilitated forests



3.2 BENEFITS OBTAINED FROM REFORESTATION AND CURRENT ISSUES

Today, the lives of the people in the ROK remain closely connected to forests, and forests continue to play an important role in the provision of public benefits in the form of ecosystem services. Forests in the ROK contribute to watershed conservation and water purification (21%), soil erosion prevention (21%), carbon absorption and air purification (20%), forest recreation and healing (16%), forest landscape (13%) as well as biodiversity maintenance (9%). In 2015, it is estimated that the economic value of forests is USD 126 billion worth of public benefits (Figure 4), which could not be created without the reforestation efforts. This means that each year, about USD 2,400 worth of public benefits from forest is provided for each citizen in Korea. Forests in Korea have been rehabilitated in the 1970s and 1980s, and are considered young. Hence, Korea has to protect these forests from various disasters, such as floods, landslides, forest fires and pests to preserve and increase forest resources. Despite the USD 2 billion investment by the KFS in nurturing, protecting and utilizing forests to ensure healthy forests, the country has now generated massive profits. Aside from public benefits, forests provide about USD 8.3 billion worth of direct economic benefits from forest products (e.g. timber, nuts and fruits, wild vegetables, soil and stones). The benefits from forests are protected from the impacts of natural disasters, thereby contributing to improvements in the quality of life as well as the creation of new forest-based industries and forest-related jobs.

► **Figure 4** Public values of forest in 2015



Along with the public's increasing demand for a better quality of life, recreational activities in forests are becoming more popular, evident by the growing number of forest visitors (Photo 10). About 15 million people (one out of three of the entire population over the age of 13) visit forests more than once a month to hike or climb. Since 1988, the recreation forest project has been implemented to meet the public demand for forest recreation, and the KFS has been operating a total of 152 recreation forests with visitor

numbers reaching 12 million per year (2012). Accordingly, diverse environmental education programs are provided to help visitors obtain a better understanding of forest and nature. Visitors also contribute to the income generated by local communities. For example, in Mt. Jiri, about 50,000 visitors can potentially generate an income of USD 0.4 million, with indirect values amounting to USD 1.07 million, and produce 53 jobs as tourist guides for local residents .



Photo 10 Mt. Jangtae Recreation Forest in Daejeon (1)
forest therapy program in Jangsung, Jeonnam province (2)



Recently, an increasing number of people are becoming aware of environmental issues, including forest degradation. At the international level, many global forest goals, such as the Global Partnership on Forest and Landscape Restoration, the Bonn Challenge, the New York Declaration, and the Paris Agreement prove that people in the world are still suffering from the adverse impacts of forest degradation. The ROK's reforestation experiences between the 1960s and the 1980s as well as its sustainable forest management practices carried out

after the reforestation may provide inspiration for other developing countries. Also, it is undeniable that the ROK's reforestation experiences contributed to achieving the UN Sustainable Development Goals (SDGs), especially SDG 1 (no poverty), SDG 2 (zero hunger), SDG 6 (clean water and sanitation), and SDG 13 (climate action) as well as 'Food Security', which is derived from the declaration of the World Summit on Food Security in 2009. Significant development from the reforestation success in the ROK helps increase the relevance of UN SDGs and global food security issues (Box 5), too.

BOX 5

Contribution of the ROK's Reforestation to Four Dimensions of Food Security (FAO, 2016)

Food Availability

- Fruits and nuts from reforestation projects
- Mushrooms and other edible, medical plants after reforestation

Food Access

- Sales of forest products
- Participation in reforestation projects for income
- Income generation from recreational use of forests

Utilization

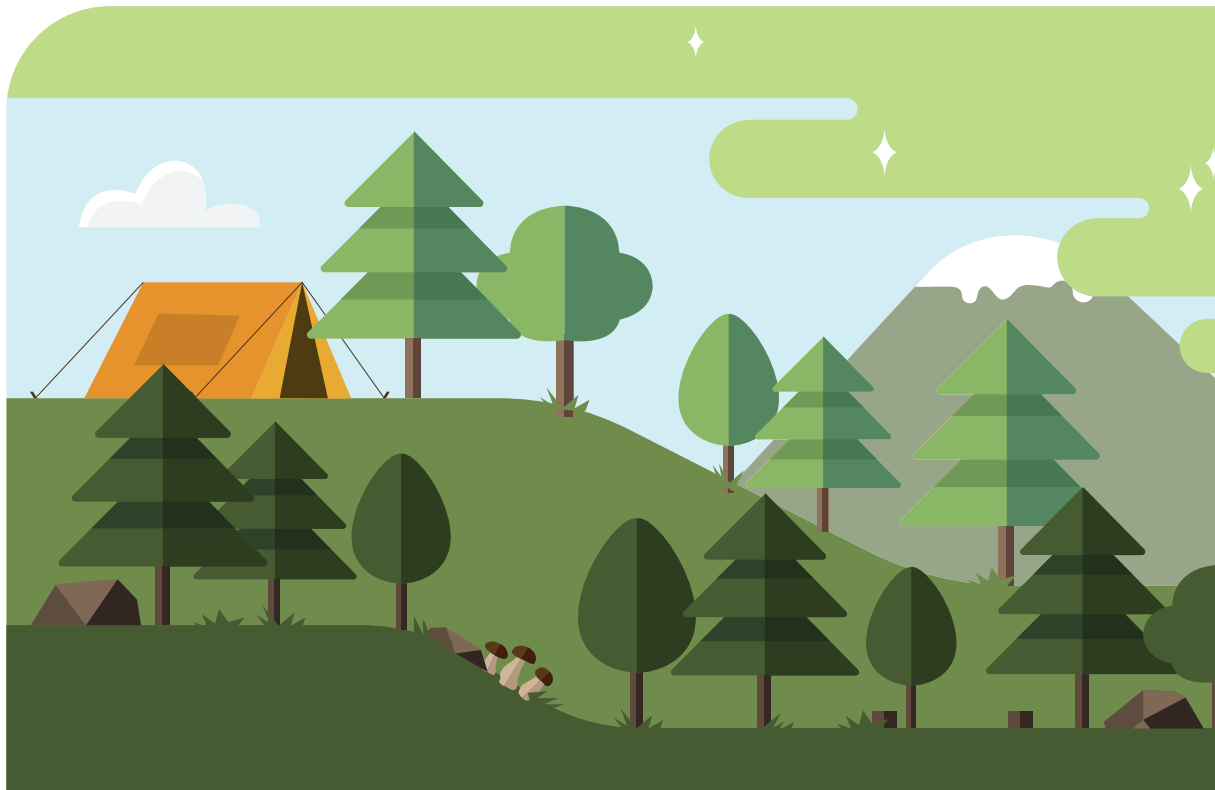
- Fuelwood for cooking
- Provision of clean water through watershed rehabilitation
- Nutrients provided by forest foods

Stability

- Improved conditions for agricultural production with enhanced forest ecosystem services

FAO, IFAD and WFP. 2013. The State of Food Insecurity in the World 2013. The multiple dimensions of food security. Rome. FAO.





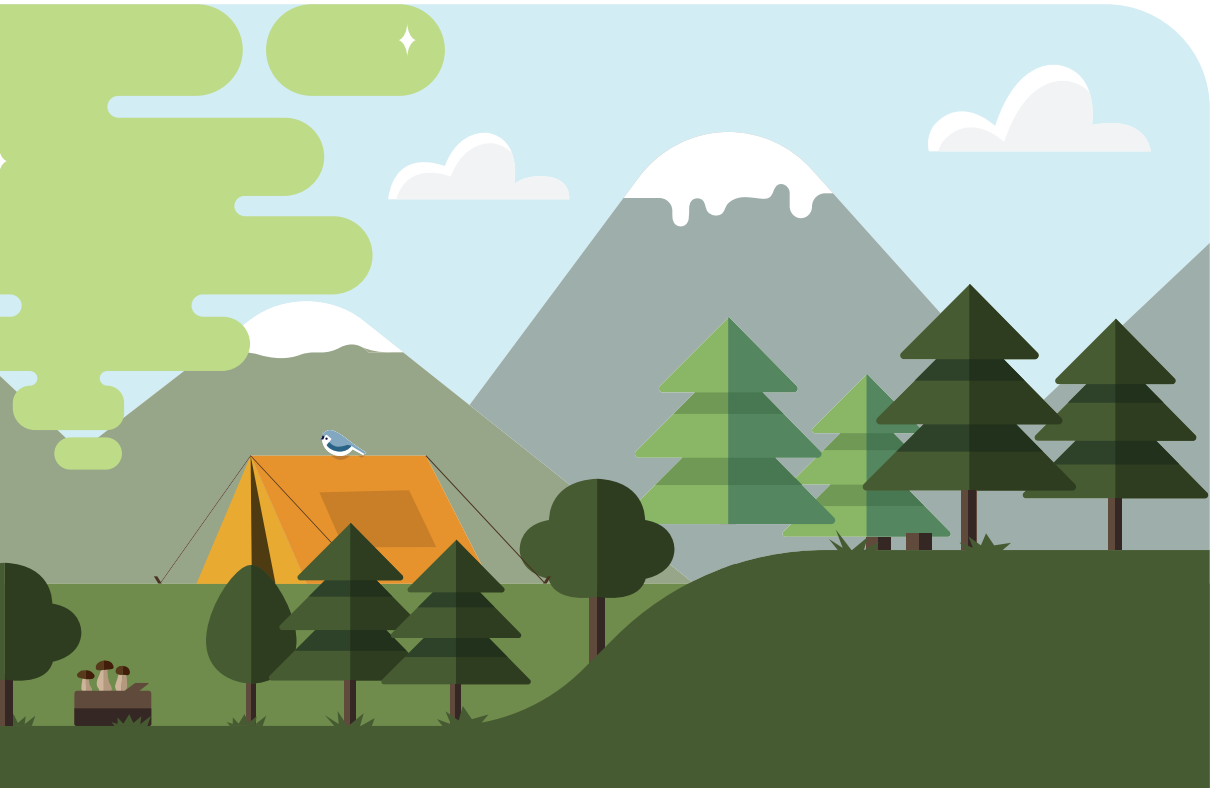
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