

# Challenges of Forest Management for Achieving the Sustainable Forest Management in DPRK

**Hyun-Ah Choi**

Hanns Seidel Foundation Korea

## Abstract

Deforestation is one of the most severe environmental problems of the DPRK, leading to soil erosion, landslide, and flooding with frequent consequences. Moreover, recently it is seriously affected living conditions with the changing climate in DPRK. Under Kim Jong Un, the active campaign for afforestation started to solve the problem of deforestation. With the onset of the administration of Kim Jong Un in 2011-2012, reforestation became a crucial national priority. While the need for reforestation was, to some extent, stressed in DPRK policy publications. With the millions of trees planted every year, albeit in an unsustainable way, under Kim Jong Un, the significance of reforestation has been highlighted in an unprecedented way. The ten-year plan for afforestation (first dated to 2013-2024, and later version 2015-2024) expects a complete tree cover on all deforested mountains, which may account for more than fifty percent of the total tree cover. It is followed by another long-term (30-year plan) to change forests from prevailing monocultures to more mixed forests with a higher percentage of deciduous trees, able to withstand climate change. This study focused on analyzing the policy to restore the forest ecosystem in DPRK related to sustainable development goals and sustainable forest management. This study can help the cooperation project avoid deforestation and move towards a sustainable forest ecosystem on the Korean Peninsula.

**Key Words:** forest policy, sustainable forest management, cooperation, capacity building

## Introduction

The Democratic People's Republic of Korea (DPRK, also known as North Korea) has considered environmental issues. From the beginning of the DPRK's existence as a socialist state, there was a specific interest in protecting national heritage, such as natural monuments or protected areas. The primary type of vegetation in the DPRK is forest and accordingly, forests are a dominant ecosystem and a key natural resource for economic development. However, deforestation has rapidly increased since the late 1990s. The DPRK has for several decades conducted extensive forest reforestation and afforestation measures.<sup>1</sup> The DPRK government started the Forest Master Plan in 2013, which is meant to recover the forest condition and improve living conditions in the next 30-years and show long-term, stepwise planning.<sup>2</sup> Significantly, the Forest Restoration Campaign was launched in 2015, and a nationwide movement to rehabilitate the deforested mountains has been carried out. The social environment in DPRK ensured the successful implementation of the campaign. While before, the need for reforestation was rejected to some extent in DPR Korean policy publications, and every year millions of trees were planted, albeit unsustainable, the significance of reforestation under Kim Jong Un has been highlighted in an unprecedented way. For instance, this issue was emphasized in his 2012 speech on land management and most recently, in 2015, in his publication "Let the Entire Party, the Whole Army and All the People Conduct a Vigorous Forest Restoration Campaign to Cover the Country's Mountains with Green Woods." Despite the government's efforts to overcome the environmental crisis and decrease the deforestation rate, there is still a long road ahead of them regarding reforestation and afforestation in

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1 UNEP, "The 4th National Report of DPR Korea to the Convention on Biological Diversity" (United Nations Environment Programme, Paris, 2011).

2 Hyun-Ah Choi, "Prospect and Implementation Strategy of the Inter-Korean Forest Cooperation: A Case Study of International Organization Support Project in DPRK," *Unification Policy Studies*, vol. 27 no. 2 (2018): 1-20.

the DPRK. This study focused on the DPRK's current forest management plan and international issues regarding sustainable forest conservation. Furthermore, this study looked into forest cooperation with DPRK and suggested applications for sustainable forest management (SFM) with the international community.

## Sustainable Forest Management Related to the Forest Policy in DPRK

According to the World Bank in 1990, 68.1 percent of the DPRK was forested. The range of total forest area has decreased from 9.85 million ha in the 1970s to 7.55 ~ 8.93 million ha in early the 2000s.<sup>3</sup> By 2016, only 40.7 percent of the DPRK was covered with forests. There are several reasons for the severe deforestation. First, the 1990's economic crisis in DPRK caused a coal shortage for residential energy use, and as a result, firewood was consumed at an unsustainable rate.<sup>4</sup> Second, DPRK's *Juche*, "self-reliance" ideology and self-sufficiency policy in food production has intensified the problem. The forest-dominant land cover and scarcity of arable land resulted in only 0.08 ha of

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3 Various researchers analyzed the forest area in DPRK using satellite imagery or estimation trends such as FAO, "Global Forest Resources Assessment 2010: Main Report," *FAO Forestry Paper 163* (Food and Agriculture Organization of the United Nations, Rome, 2010); Kyung Seok Park, "Forest Condition and Policy in North Korea," *KREI Quarterly Agricultural Trends in North Korea*, vol. 15, no. 3 (Autumn 2013): 1-21; Korea Forest Service, *2011 Annual Report of Trend in Forest and Forestry* (Korea Forest Service, Daejeon, 2012); Damin Kim et al., "Estimation of Future Carbon Budget with Climate Change and Reforestation Scenario in North Korea," *Advances in Space Research*, vol. 58, no. 6 (2016): 1002-16; Dong Kun Lee, Young Chool Oh and Jae Uk Kim, "A Study on Forest Changes for A/R CDM in North Korea," *Journal of the Korea Society of Environmental Restoration Technology*, vol. 10, no. 2 (2007): 97-104; So Hee Park, Ja Choon Koo and Seok Hyun Deok, "Selection of Primary Site for Deforested and Degraded Mountain Restoration Projects in North Korea," *Korean Forest Economics Society*, vol. 21, no. 1 (2014): 37-46; Korea Forest Research Institute, *Cooperation Direction and Assignment for Restoration of Degraded Forest in the DPRK* (Korea Forest Research Institute, Seoul, 2010); FAO, "State of the World's Forests 2009" (Food and Agriculture Organization of the United Nations, Rome, 2009) and so on.

4 Ken Piddington, "DPR Korea: State of the Environment" (United Nations Environment Programme, 2003).

available farmland to each person, far short of producing adequate food supply to support the population.<sup>5</sup> The DPRK rulers have ordered farmers to convert forests into agricultural land to increase food production.<sup>6</sup> The final cause of deforestation is a natural hazard and associated secondary disasters. Forests provide essential ecosystem services, including climate regulation, erosion control, and food production.<sup>7</sup> The increase in runoffs also resulted in the loss of crucial farmland developed in hilly areas because of widespread soil erosion due to the absence of efficient sloping land management.

In DPRK, the forest restoration project started in 2015 and is planned until 2044 (former 2013-2042). It is called the Forest Master Plan (National Forestation Strategy) and will span 30 years at the national level. This master plan includes critical topics, such as adaptation to climate change and disaster prevention, and the improvement of livelihood by increasing direct food production and the increased value of forests through an increase of forest products, such as oil-seed fruit trees, and nut-bearing trees. The key slogans of the current efforts for reforestation are *Hwanggeumsan* (Golden Mountain), and a conversion into *Pomulsan* (valuable mountains), which in the DPRK refers to tree use species of higher economic value. It also includes forest restoration plan and strategy (2015-2024) and forest protection plan.<sup>8</sup> The forest restoration plan and strategy, a 10-year plan, aims to maintain the survival rate of trees planted in the mountainous area and plant 6.3 billion trees in the 1.67 million ha of mountainous area. Moreover, 340 million trees will be planted on agricultural lands with slopes over 20°,

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5 Graham Ashford et al., *Democratic People's Republic of Korea Environment and Climate Change Outlook* (Ministry of Land and Environment, Pyongyang, 2012).

6 Rakhyn E. Kim, "International Environmental Cooperation of the Democratic People's Republic of Korea" (paper presented at the DMZ Forum, April 2015); Park, "Forest Condition and Policy in North Korea": 1-21.

7 Matteo Vizzarri, Roberto Tognetti and Marco Marchetti, "Forest Ecosystem Services: Issues and Challenges for Biodiversity, Conservation, and Management in Italy," *Forests*, vol. 6, no. 6 (2015): 1810-38.

8 MoLEP, *A 30-year National Forest Restoration Plan of Democratic the Democratic People's Republic of Korea* (Ministry of Land and Environment Protection, Pyongyang, 2014).

an additional 110,000 ha, by 2022. Consecutively, all trees planted will be monitored for two years to overview the survival rate of trees. In the forest restoration plan's first phase (2015-2017), the tree nursery area should increase to 13,000 ha, from 7,600 ha in 2014. According to the DPRK's Forest restoration plan and strategy, the tree nursery area should produce 1.4 billion tree saplings during the first phase. Approximately 1,036 ton of seed is needed per year for the whole DPRK. The tree species use for forestation are mostly Japanese larch (*Larix kaempferi*), Korean pine (*Pinus koraiensis*), pitch pine (*Pinus rigida*), Japanese cedar (*Cryptomeria japonica*), and chestnut tree (*Castanea crenata*). The 113 km long forest fire prevention line will be installed, and 3,090 km of the fire prevention line will be installed at the national level until 2024. Prevention of disease and insect pest plan aims to mobilize by manual removal of pest with the military labor force and use bio-pesticide and chemical pesticides. The plan also includes an increase in the number of parasitic bees and facilities producing bio-pesticide. To reduce the damage caused by landslides and floods, projects on the prevention of erosion will be conducted over 100,000 ha and river management, including the construction of dam and waterway. According to the national forest restoration plan, forest restoration and protection projects are implemented every year and it is DPRK's priority to be carried out until 2024. In 2017 the first phase of the afforestation plan has been successfully finished according to the Ministry of Land and Environment Protection (MoLEP), which oversees the Forest Restoration Battle (FRB), observing the country by MoLEP that there has been made visible progress in many places.

In 2016, the DPRK ratified the Paris Agreement and UN 2030 Agenda for Sustainable Development Goals (SDGs). SDGs are a promising way to improve livelihood and human rights since the SDGs are accepted by the DPRK and the focus of several projects. The DPRK has published the 2021 voluntary national review (VNR) at the High-Level Political Forum on SDGs. Assessing forest sustainability conditions will help clarify forest management under climate change in

DPRK. The DPRK Government's national forest restoration plan is linked to the SDGs. The analysis of the connection among forest policy, and indicators, and detailed targets of SDGs in the DPRK are shown in Table 1. SDG 15 “Life on Land: Protect, Restore, and Promote Sustainable Use of Terrestrial Ecosystems; Sustainably Manage Forests; Combat Desertification; Halt and Reverse Land Degradation, and Halt Biodiversity Loss” is directly related to forest policy in DPRK and other SDGs like SDG 13 (Climate Action). The forest policy in DPRK also has the interactions which occur in soil protection, water-food-energy nexus, the global partnership for Disaster Risk Reduction (DRR), Forest Land Restoration (FLR), and Land Degradation Neutrality (LDN) by United Nation. The SDGs' targets related to the Forest Restoration Campaign are 13 and 15, and its detailed targets are 13.1, 15.1, 15.2 and 15.3. The targets of the SDGs related to Forest restoration plan and strategy are 13 and 15, and its detailed targets are 13.1, 15.1, 15.2, 15.3, 15.4

**Table 1. SDGs Related to Forest Policy in DPRK**

Goal	Related policy	Related regulation	Competent authority	Thematic reference
13	National Disaster Reduction Strategy (2019-2030), National Environmental Protection Strategy (2019-2030)	Disaster prevention, relief and recovery law	State Committee of Emergency and Disaster Management, Ministry of Land and Environment	DRR, Water-food-energy nexus
15	National Forestration Strategy (2015-2044), Forest restoration plan and strategy (2015-2024), National Agroforestry Strategy and Action plan (2015-2024)	Forest law, Disaster prevention, relief and recovery law, Forest ordinance, Agroforestry regulation	Ministry of Land and Environment	Soil protection, Water-food-energy nexus, DRR, FLR, LDN

Source: Own compilation based on DPRK's VNR and MoLEP's planning materials

and 15.5.

The Sustainable Development Solutions Network has provided indices to the SDGs to support the sustainable development of individual countries. The DPRK has not been evaluated for decades because roughly 40% of the data required to assess the SDGs are missing. Previous studies have significant restrictions on data collection from DPRK, but recent studies have employed remote sensing data to overcome these limits. Two Koreas agreed on environmental cooperation to protect and restore the natural ecosystem in 2018 as a follow-up to implementing the Panmunjom declaration. In addition, Korean-SDGs newly added the target 16.13 to ensure inter-Korean cooperation for peace and prosperity.

## Sustainable Forest Management Approaches in DPRK with Cooperation

### Achievements and Limitations for Sustainable Forest Management in DPRK

Recently, in cooperation with the international community, the DPRK government has been trying to achieve SDGs designed to overcome environmental issues, social and economic limitations, and include climate change, to finally promote the sustainability of future generations. For example, on the 22nd of April 2016, the DPRK government signed the Paris Agreement under the United Nations Framework Convention Climate Change and ratified on the 1st of August 2016. In addition, the government set up the “UN Strategic Framework 2017-2021 DPRK” to select four priorities, including resilience and sustainability. It means the DPRK's readiness to engage in active exchange and cooperation as a member of the international community in the field of the environment. Furthermore, the government is making efforts in terms of: eliminating poverty of DPR Koreans (SDG

1), keeping people's hunger away (SDG 2), maintaining healthy and good quality of life (SDG 3), activities on the environmental protection (SDG 13), clean water and sanitation (SDG 6), conservation of water resources (SDG 14), ecological protection (SDG 15), and strengthening partnerships for SDG (SDG 17). In connection with the current environmental activities in and out of DPRK, MoLEP was appointed to be the liaison officer in 2019, being a government-designated organization for the Green Climate Fund and the director of the International Cooperation Agency. The designation of MoLEP as an intermediate can be seen as a part of efforts to take action against climate change and its effects, and it highlights the policy efforts and the FRB for forest restoration in DPRK.

The Kim Jong Un regime carried out a constitutional revision and enacted the related legislation. It released a statement on “bring[ing] about a revolutionary shift in national territory management project in line with the demands of constructing a prosperous socialist nation.” This message was addressed to the people responsible for the party, national economic institutions, and labor organizations on 27 April 2012. In this statement, the government ordered to thoroughly carry out afforestation and project on protection and management of forests along with land management projects. It was also ordered to make all the mountains of the DPRK thick with trees by 2022. The statement also covered the strengthening of water management projects through the purification of rivers and streams, the modernization of roadways to increase the weight and speed of transportation, and environmental protection projects. The Kim Jong Un regime announced a declaration of forest enacted on March 17, 2015 for afforestation and restoration and prohibited activities which hinder afforestation and forest development. Since Kim Jong Un came into power, the DPRK developed science and technology-oriented policies, focusing on Pyongyang. The policies emphasized the city's greening, land management, and forest protection projects while highlighting the city's beautification by constructing Changjon Street and Scientist Streets. In April 2019, the DPRK revised

its constitution, specifying scientific technologies as the nation's most important strategic resource. The revised form also included information on people's economy and technology investment expansion. The government of DPRK announced a plan to afforest plant spruce trees, oak trees, pine trees, birches, and mixed forests to enhance the ability of forests to absorb carbon dioxide and store water around tree-planting day on 2nd of March 2020, and a plan to increase the forest per unit area to produce high-quality materials. Furthermore, the government also announced a plan to successfully carry out forest restoration, including strengthening remote training by using *Hwanggeumsan* as the internal network of forest resource management.<sup>9</sup>

The singularity of the Kim Jong Un regime is that the DPRK became aware of the needs and methods of environmental protection when developing and using tourism resources. The development of economic development zone since 2013 also emphasizes on ecological protection, with one of the principles of growth being the protection of the economic development zone and its surrounding natural ecology. The government is required to set proper standards of environmental protection for each development zone, implement the environmental protection plan for the year, and establish measures to prevent environmental pollution. For example, in 2013, the government adopted a renewable energy law and established Korea Green Fund (KGF) to support activities supporting a green society. This support concerned the economy and environment in 2014, such as the continuous use of green energy, the efficient management of land, forest and water resources, the saving resources, the construction of a cycloid economy, and the prevention of environmental pollution. KGF activities aim to “convert the whole nation into forest and garden,” which Kim Jong Un regime emphasized. The KGF also acts as a non-governmental fund to conduct international cooperative activities, with fundraising supported by

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<sup>9</sup> KCNA, “Homepages Helpful to Forestation” (Korean Central News Agency, September 27, 2018); Naenara, “Hwanggeumsan 2.0,” *Naenara (in DPR Korean)*, January 24, 2020.

domestic and foreign institutions, organizations, companies and citizens, as well as the donations and real estate from overseas DPR Koreans and foreigners.

Moreover, environmental protection regulations for Rason economic and trade zone enacted on the 23rd of July 2014 included a clause specifying that companies that want to develop and construct in Rason Special Economic Zone are required to receive an environmental impact assessment to obtain a construction permit. This regulation provides specific and clear provisions regarding the disposal of sanctions, including listing 17 types of actions that result in fines. Unlike environmental protection regulations for Kaesong industrial region enacted on the 11th of November 2006, it is believed that there is a strong will to regulate the activities harming the environment of Rason special economic zone.

The DPRK has adopted relevant laws and regulations and their development through modifications to understand and respond to the importance of environment-related policies. This shows a will to develop the economy while protecting the natural environment in the economic development zones. In particular, the government is making efforts to establish environment-related policies and promote the environment of the national land by introducing advanced scientific technologies. The DPRK also carried forward a project to restore degraded forests, as readiness project of Green Climate Fund.<sup>10</sup> However, the DPRK's forest policy is a national unit plan that does not include the use of satellite data, and therefore an action plan that considers forest ecosystem by region is needed.

Similarly to the economic development of other developing countries, DPRK prioritization of development rather than environmental protection results in a conflicting situation. It is not easy for DPRK to strongly promote ecological environment protection while it is

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<sup>10</sup> Green Climate Fund, "NDA Strengthening and Country Programming Support for DPR Korea through FAO," accessed September 13, 2021, <https://www.greenclimate.fund/document/nda-strengthening-and-country-programming-support-dpr-korea-through-fao>.

internationally recognized as the poorest country. However, the DPRK has a strong interest in environmental protection, as reflected through its policies. When looking at the DPRK's ecological environment protection policies, it is primarily focused on absolute protected area and historical sites. Then, policies also cover the protection of touristic regions and famous sights that can generate revenue through tourism. Third, the new policies are the result of international environmental cooperation. These promote the exchange of human resources (capacity building), overseas trips, and support from the international community to protect sites such as biosphere reserves and bird sanctuaries. The DPRK's ecological environment protection policy is pursued maintain the “*Suryong* (Leader) System” and the protection of tourism is a resource to earn foreign currency.

In the field of economic development, the keyword “self-reliance” was emphasized by Kim Jong Un at the 5th plenary session of the 7th Central Committee of the Korean Worker's Party held in late December 2019. Under the international sanctions on the DPRK, “the system, order and arrangement of economy and business,” “increase of major industrial tasks and agricultural production,” “improvement of science, education and health projects,” and “measures to protect the ecological environment and prevent natural disasters” were presented as significant tasks. This reflects the policy intentions of the top leader, aiming at decisive measures to establish a national crisis management system to handle natural disasters and thoroughly protect the forest. It should first examine how the DPKK government will implement the environmental policies decided by the plenary session after 2020. It should discuss environmental cooperation with the DPRK to ensure sustainability and achieve results. Currently, the DPRK is actively promoting the construction of tree nurseries in each province and modernizing the tree nursery in the county units. The main tree nurseries are 122 tree nursery by the People's Army, the Gangwon Province tree nursery, and the Jungpyong tree nursery in Hamgyong Province at the national level. Together, these nurseries aim at producing 20 million trees annually by focusing on the

production of seedlings, the shells needed for FRB.

## Cooperation for Sustainable Forest Management in DPRK

DPRK has tree planting strategy. The afforestation and greening in DPRK remain a challenge, but it is good to see that DPRK started to work on it. New tree nurseries were built, and people mobilized for tree planting at province and county levels. However, resources necessary for the FRB's success are lacking, such as pipes and fertilize. In addition, there is a lack of knowledge on sustainable forestry management.

Like the Republic of Korea (ROK), DPRK needs support from the international community for SFM. The ROK, since the 1960s also started a successful afforestation program, together with a comprehensive village renewal program, leading to fast-recovering forests and development in the country. Measured by the growth of forest stock, it was one of the most successful countries regarding afforestation. However, new challenges, like upgrading the quality of forests, sustainable economic use of forests, and climate change adaptation have to be resolved. In its drive for afforestation, ROK used large-scale community action with human resources and modern technology, capacity-building, and international cooperation. The German forest service cooperated with the RO Korean forest authorities for several decades. ROK established the organization named Korean-German Forest Management (KGFM) Project in 1974, in Yangsan, South Gyeongsang Province, ROK, to oversee forestry management. During the project, the German foresters helped open the forestry management office in Yangsan in 1975 alongside a forest machinery education center in 1982 in Gangneung, Gangwon Province, ROK. German foresters from the State Forest of Hesse organization worked alongside RO Korean colleagues for the afforestation of the country, and also closely cooperated with the scientific personnel in ROK, having for a long time an office at the grounds of the Korean Forest Research Institute (today National Institute

of Forest Science) under Korea Forest Service. Based on this experience, ROK can improve SFM techniques and implement successful short-term reforestation.

One of the German organizations, Hanns Seidel Foundation (HSF), carried out the project called Improvement of rural living conditions through healthy forests - establishment of a Training Center for Sustainable Forestry in DPRK together with the Forest Management Research Institute (FMRI), Academy of Forest Science under the MoLEP in Sangseo-Ri, South Pyongan, DPRK.<sup>11</sup> This project is similar to KGFM, but it's a small-scale cooperation project. In this project, a Training Centre for sustainable forestry, established in the Central Tree Nursery, has effectively operated and provided good opportunities for science and technology dissemination, contributing to the project and the FRB. In the training centre, equipped with a modern education system such as online learning materials, DPRK researchers developed and operated. This intranet supports general tree planning documents and information at province, city, and county levels. In addition, Pureonsan (Green Mountain), an advanced intranet, is organized by the Academy of Forest Science for researchers. The project improved the local livelihood, which relies heavily on the forest and its products.

One of the main focuses was on training for sustainable forestry management. In this project, 11 local trainings, 5 international seminars and 5 times of oversea trainings were successfully carried out to strengthen the FMRI and experts' technical capacities. The local and central government experts and research institutes participated in the training to develop the country-specific advanced forestry technologies in DPRK. The FMRI and other beneficiaries could increase their technical capacity related to sustainable forestry through the abovementioned activities. At the same time, the project sites could maintain the material

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<sup>11</sup> HSF, "Final Report EU-Project" (Hanns Seidel Foundation Korea), accessed November 2, 2021, [https://korea.hss.de/fileadmin/user\\_upload/Projects\\_HSS/Korea/Dokumente/Flyer-and-Booklets-Publications/FLYER-EU-PROJECT.pdf](https://korea.hss.de/fileadmin/user_upload/Projects_HSS/Korea/Dokumente/Flyer-and-Booklets-Publications/FLYER-EU-PROJECT.pdf).

and technical basis for sustainable forest management. The partner organizations widened their network significantly by working with many institutions and organizations in environmental fields. Through the activities, the technical knowledge of the partner organization was increased, and contacts with relevant technical and scientific counterparts in China, Mongolia, and Germany were established. Some of the contacts lead to other and independent exchange and internationalization of the DPR Korean forestry sector. The project sites provide space for foresters' training and a showcase for sustainable and successful reforestation efforts while improving the livelihood of the local people and additional benefits from ecosystem services around villages in Sangso-Ri. As this project has shown, FMRI and related organizations in DPRK need capacity building and network with the international community to implement SFM. In addition, under the COVID-19 pandemic situation, HSF organized virtual lecture series with MoLEP focused on forest pest control, forest Certification, and SFM.<sup>12</sup> It's an example of the way of cooperation in DPRK regarding SFM. International organizations such as Food and Agriculture Organization, Concern Worldwide, and HSF have capacity building and implementing model projects for many years. It shows the organization has to support the knowledge and training.

What can realistically do in a time when sanctions still exist? The challenge in preparing a thorough afforestation plan is supporting a new, modern forest inventory of DPRK for SFM. A forest inventory is the systematic collection of data and forest information for assessment or analysis. Estimating timber's value and possible uses is an essential part of the broader information required to sustain ecosystems. The forest inventory collects species, diameter at breast height, height, site quality, age, and defects. One can calculate the number of trees per acre, the basal area, the volume of trees in area, and the timber value

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12 HSF, "Sustainable Forest Management and Forest Certification with North Korea" (Hanns Seidel Foundation Korea), accessed November 2, 2021, <https://korea.hss.de/en/news/detail/seminar-1-news7938/>.

from the data collected. In the ten-year forest restoration plan and strategy (2015-2024), DPRK already specified the number of hectares to be reforested and the main tree species, information found on the county level in many places in maps outside tree nurseries. However, this information is not enough. In particular, the calculation and changes of biomass are essential since planting many hundred trees might not be enough if much stronger older trees are felled, resulting in a decline of forest biomass despite evident plantation of new trees.

The forest inventory is not only crucial for national deciders to evaluate the success of the FRB. As a baseline, it is indispensable for projects of green finance in the future; all international donors able to finance afforestation projects, e.g., as part of climate change policies, first need to see this baseline. A second, related but even more significant consideration is the question of material aid for afforestation. Today, the Green Climate Fund (GCF) has become a significant source of funding of projects on climate change, including afforestation, biodiversity projects, etc. DPRK is ready to cooperate with the GCF. But it still has to go a long way due to UN sanctions. One meaningful way of supporting DPRK could be an agreement of funding organizations, the UN, and other important actors like the US to define which forest-related activities would be possible under the current sanctions regime and which might be exempted in the future. It could be an essential focus of forest-related diplomacy of ROK, but not much has been achieved in this way. The emphasis on forestry would probably also help inner-Korean relations much more than plans for large-scale economic cooperation such as industrial or transport since it could start small-scale but soon and lead to practical collaboration and trust-building. For ROK and the international community, much remains to be done. However, it is good to see that nature can retake its place reasonably soon. ROK, itself for decades suffering from severe deforestation, is a good example, with its current health and slow aging forests, which cover all mountains. In addition, the Korean Peninsula is one of the countries most affected by climate change already. In DPRK, with a

weak environmental protection system and severe problems due to decades of environmental mismanagement, mainly deforestation, related disasters like droughts and floods, are likely to be exacerbated. ROK again is one of the world's largest emitters of CO<sub>2</sub>. Since it vowed to become climate neutral in 2050, it has to work hard to find ways to reduce dependency on fossil fuels. In 2020, the ROK designed a new strategy to create a carbon-neutral society through the Korean New Deal policy. As a result, ROK should consider the carbon removal to decrease by 30% from the current level by 2050. Innovative forest management is key to increasing carbon sink and storage. The ROK plans to increase carbon sinks by creating urban green spaces for recreational use, restoring degraded forestlands, and tree-planting in underutilized lands. It will continue its forest management to maintain forest carbon removals at the highest level possible by changing tree species and implementing programs to keep the forests.<sup>13</sup> In this part of the plan, Korea Forest Service (KFS) announced 3 billion new trees would plant over the next 30 years after logging aged trees to offset carbon emissions and US\$ 5.3 billion will invest in creating pristine forests by 2050. KFS also has plans to expand carbon sink and storage through inter-Korean forest cooperation by 2050.<sup>14</sup> In line with the new climate system, the ROK will plant 300 million trees in DPRK to restore devastated forests, absorb 1 million tons of carbon every year, and restore 147,000 ha. Creating a cooperative model to distribute incentives to DPRK authorities and residents planting and cultivating forests is necessary. DPRK's failure to climate change could undermine political stability on the Korean

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13 The Government of the Republic of Korea, "2050 Carbon Neutral Strategy of the Republic of Korea - Towards a Sustainable and Green Society" (The Government of the Republic of Korea, Seoul, 2020).

14 Korea Forest Service, "Plant 3 Billion Trees by 2050 to Reduce 34 Million Tonnes of Carbon" (Korea Forest Service, January 20, 2021), accessed November 2, 2021, [https://www.forest.go.kr/kfswb/cop/bbs/selectBoardArticle.do?jsessionid=Spxy5h6EeTZ1roxjK0scA2d20J77z4qm3PCf1gatJOFFPOhCJnxl4tBz5IQ3XQDH.frsws02\\_servlet\\_engine5?nttld=3154431&bbsld=BBSMSTR\\_1036&pageUnit=10&pageIndex=1&searchtitle=title&searchcont=&searchkey=&searchwriter=&searchWrd=&ctgryLrcls=&ctgryMdcls=&ctgrySmcls=&ntcStartDt=&ntcEndDt=&mn=NKFS\\_01\\_01&orgld=](https://www.forest.go.kr/kfswb/cop/bbs/selectBoardArticle.do?jsessionid=Spxy5h6EeTZ1roxjK0scA2d20J77z4qm3PCf1gatJOFFPOhCJnxl4tBz5IQ3XQDH.frsws02_servlet_engine5?nttld=3154431&bbsld=BBSMSTR_1036&pageUnit=10&pageIndex=1&searchtitle=title&searchcont=&searchkey=&searchwriter=&searchWrd=&ctgryLrcls=&ctgryMdcls=&ctgrySmcls=&ntcStartDt=&ntcEndDt=&mn=NKFS_01_01&orgld=).

Peninsula, so if the two Koreas can cooperate to climate change by establishing a system to respond to climate change jointly, it is also vital as a task. DPRK will contribute to peace on the Korean Peninsula by first using the path of forest restoration to establish a non-political climate change joint response system related to the Kim Jong Un regime's FRB. In addition, from the ROK's point of view, it can be a Win-Win strategy that can expand carbon storage and absorption sources through inter-Korean forest cooperation to achieve the goal of carbon neutrality.

## Conclusion

For many areas, DPRK has been isolated from cooperation in various fields. It is one of the reasons why so much is unknown about the country. Its district's political and social system suggest that the country's opening can not be expected any time soon. However, there are topics where cooperation is not only beneficial but urgently required. Environmental protections, climate change and SDGs are such topics. We cannot achieve global, regional, and national changes without coordination and joint effort. The increased awareness of SDGs has quickly affected other fields, and the understanding that forests and biodiversity are key elements of a functioning ecosystem also has been increasingly recognized in DPRK. Forest cooperation with DPRK is difficult because of the current relations between the two Koreas, UN sanctions on DPRK, and the COVID-19 pandemic. Nonetheless, it is necessary to prepare to respond to the climate crisis and cooperate with DPRK in the near future. Thus, this study analyzed the forest policy in DPRK concerning the SDGs, and suggested cooperation with DPRK for SFM. Numerous international actors can address multiple topics, including forestry, specifically sustainable forestry in the DPRK, wetland, and biodiversity conservation. The case of international organizations that continuously conduct exchange and cooperation is an important measure

of collaboration. It furthermore leads to dialogue and cooperation while also building empirical trust with DPRK. In particular, it supports soft-power instead of hard-power. It brings people together and improves education while exchanging information and cooperating. Therefore, it is necessary to build mutual trust with DPRK through environmental partnerships, including forests, conduct various information exchanges and pilot projects, and take a step-by-step approach to work on small and large-scale projects. Although this study analyzed DPRK's forest policy, follow-up studies are needed to evaluate the implementation of linked policies and measures to maximize policy effectiveness in DPRK.

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