Empowered lives.
Resilient nations.

UN-REDD PROGRAMME

Food and Agriculture Organization of the United Nations

UNEP

1st-14th March, 2016

Lessons Learned from Forestry Development in South Korea and China

Report of the Ethiopian Delegation Visit to the Republic Of Korea and Peoples Republic of China

Key Lessons

- Developing countries with low income level, need to embark on solving forestry problems and this requires strong and committed leadership along with efforts to put forest issues at the forefront of its national agenda. Experiences show that success is vested up on policy and implementation approaches to address critical drivers of deforestation.

- Governments need to present clear policy goals and adopt advocacy strategies to achieve continuous promotion of forest sector development programme to ensure the support and attention of the public at large.

- It is important to mobilize regional authorities for increasing coordinated capacities to attract funding and engage in the investment phase- through nationally coordinated policies and measures

- Capitalize on organizational learning to enhance effectiveness, including partnership management in the forest sector and Institutionalize a stable institutional setup and commitment at various levels to achieve forest rehabilitation success

Foreword

Economic development is dependent on how we use our natural resources and maintain the state of the environment sustainably. Continuous success with the forest rehabilitation plans becomes the driving force behind sustainable economic growth and improved quality of life for many nations including the Republic of South Korea and the People's Republic of China. Ethiopia is well aware of this context while designing its own development strategy. However, the country needs to invest additional efforts to implement the ambitious targets set in the Growth and Transformation Plan. Forests and trees outside forests have a unique role to play in the Ethiopian landscapes. They provide food and energy, support biodiversity and other basic environmental services. The importance of the trees outside the forest can never be undermined as they have a pivotal place within the Ethiopian landscape from an environmental and ecological perspective.

So far, deforestation and forest degradation are serious problems and require urgent effort from every sector. However, no sector can solve the problem on its own or within a short time frame. Identifying new approaches and measures to reap the potential of the forest sector to contribute to climate change mitigation and livelihood is a required priority.

The current contribution of the forest sector to the economic development of the country can be improved by putting a lot of effort in curbing the rate of deforestation; embarking on small and large scale afforestation and reforestation activities and promoting Sustainable Forest Management in the country. Experiences from the Republic of South Korean and the People's Republic of China can be considered as the best case in this point. The Ministry of Environment, Forest and Climate Change of the Federal Democratic Republic of Ethiopia in collaboration with UNDP and UN-REDD has organized a high level visit to both countries to share experience and design a roadmap for the forest sector development program at home. The high level delegation, which involved Ministers, Regional Presidents and high level experts from both sides has created an excellent opportunity not only to share knowledge but also design future joint engagement strategy with specific areas of cooperation identified by both countries.

The experience sharing has revealed as one of the key lessons learned that strong conviction of the leaders and the public at large supported by scientific techniques is critical to achieve success in the forest sector. Fast, consciously planned reforestation by the people followed by close post planting management has been instrumental for the success. Forest rehabilitation has evolved dynamically in subsequent phases with capable and stable institutions at its core. Both Kore and China have continuously explored key issues on forest sector program design, forest science and education system and this has been extremely beneficial for Ethiopia in order to contribute to the design of the Ethiopian model of forest sector development program.

It is my conviction that, my Ministry together with Partners will soon embark on designing nationwide and regional forest sector development program that can serve as framework for the coming decade or so.

HE. Dr. Shiferaw Teklemariam

Minister, Ministry of Environment, Forest and Climate Change

Introduction

Developing countries with low income level need to embark on solving forestry problems and this requires strong and committed leadership along with efforts to put forest issues at the forefront of the national agenda.

As part of the national **Climate Resilient Green Economy (CRGE) Strategy**, Ethiopia has defined the role of the forest sector in emission reduction and economic development. The national strategy identifies and thoroughly analyses institutional and technical issues of the forestry sector that are directly or indirectly expected to contribute to the national emissions. It also identifies the necessary measures for creating enabling implementation framework for reducing emission from deforestation and forest degradation **(REDD+)** in the country. Thus, the success of the forest sector for achieving the desired goals of emission reductions or removals and maximizing other co-benefits is highly dependent on effectiveness of the sectoral development program and cross-sectoral coordination mechanism. Ethiopia had the opportunity to better understand policy and legal instruments, practical experiences and institutional arrangements to position forestry as a key lever for the climate resilience and green economy in the country.

The **Ministry of Environment, Forest and Climate Change** of the Federal Democratic Republic of Ethiopia has purposely organized a high level visit to Republic of Korea (henceforth South Korea) and the People's Republic of China (henceforth China) to share experience and design a roadmap for the forest sector development program that can serve as a master plan for the coming ten years. The high level delegation, which involved Ministers, Regional Presidents and senior experts has created an excellent opportunity not only to share knowledge but also design future joint engagement strategy with both countries. The experience sharing has shown the importance of strong conviction of both leaders and the public at large supported by solid scientific methods and research.

Fast, consciously planned reforestation by the people followed by close post planting management has been instrumental for the success in the visited countries and forest rehabilitation has evolved dynamically in well-

designed phases through capable and stable institutions at its core. Both countries have continuously explored key issues on forest sector program design, forest science and education system and this has been key lesson to design the Ethiopian model of forest sector development program. Ethiopia needs to set clear policy goals, institutional framework and publicity strategy to achieve continuous promotion of forest sector development programme over a long period of time to ensure attention of the government and its people in forestry endeavors.

The following **report highlights lessons learnt from the high level mission to South Korea and China from 1st-14th March 2016.** The experiences show that success is derived not only from the strong commitment of the people and its dedicated leadership but also sprung from clear policy and implementation approaches aimed at addressing critical drivers of deforestation.

Missions Objectives

The main goal of the knowledge exchange was to gain experiences and build capacities to enhance fast and large scale forest sector development in Ethiopia so as to contribute to the multiple benefits inter alia mitigation, adaptation, poverty reduction and rural livelihood improvement. The visit to South Korea has focused on how to sustainably manage and protect forests, how to engage in bold reforestation processes nationwide in order to stabilize high forest cover and ultimately better position the forest sector in a comprehensive vision of sustainable development whereas the visit to China has been focused primarily on bamboo utilization and production.

The learning exchange had the following specific objectives:

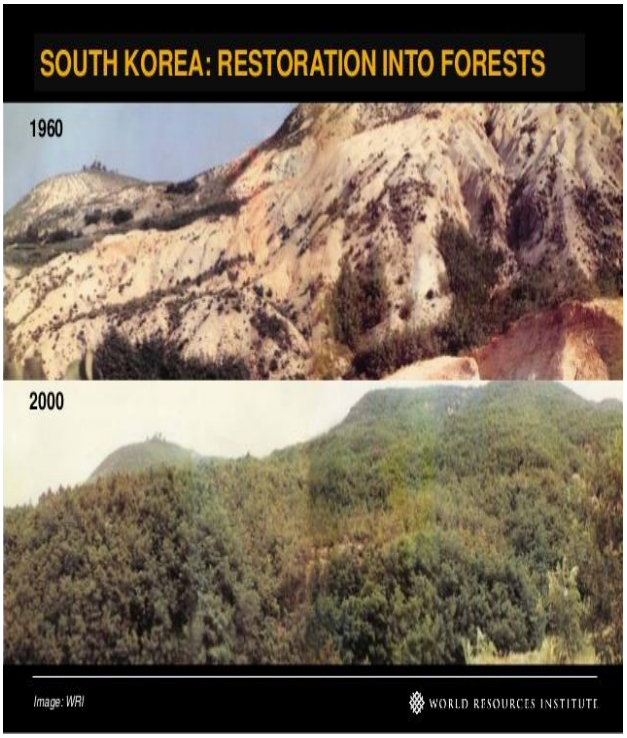
- Understanding the key elements of the policy and legal instruments including the law enforcement mechanisms that foster sector development at transformational scale in South Korea and China
- Assess and grasp the institutional arrangement that elevated the forestry sector as part of the national vision to anchor sustainable development
- Understanding key factors of success including systems to navigate through weakness, risks, strengths and opportunities to make progress in the forestry sector
- Understanding how forests are monitored, managed and valued including marketing and value addition mechanism for forest products
- Assess the role of the different stakeholders in the process in the forest sector of both South Korea and China

Experiences from Visit to the Republic of Korea

Background

South Korea located in Northeast Asia, has an area of 100,210 Km2 with a population of 51,541,582. South Korea has marked impressive transformations in its economy and forest sector over the last 50 years. The economy has grown from a GDP per capita of 67 USD in the 1950s to the current 27,970 USD. In parallel the forest growing stock increased from 6m3/ha to 126 m3/ha over the same period. South Korea is now considered as model country for its reforestation success in a short period of time and an example for the whole world. The country has transformed the landscape from an utterly barren land to the current 64% forest cover just in a period of about 50 years. Degradation of South Korea's forest was caused by over-exploitation (timber harvesting) of the forest resource and deforestation by the slash and burn farming during the Japanese colonization.

Deforestation and forest degradation was aggravated by the Korean War in the early 1950s. Weak governance and over use of fuel wood due to increasing population after the war also contributed to further degradation of forest. South Korea made significant efforts to rehabilitate its forest resources. Early forest rehabilitation efforts failed due to lack of policy and institutional mechanism. Consequently, South Korea made legal, operational and institutional measures in the 1960s. The first Forest Law was enacted in 1961 and in 1964, South Korea started to implement firewood development projects. The Korean Forest Service was established in 1967 whilst in 1973, South Korea developed the Forest Rehabilitation Plan, followed by a series of four periodic forest development plans. The fifth Forest development plan is being implemented between 2008 and 2017. The continuous forest development plans with a stable institutional background has been considered as one of the major forestry factors that lead to the successful reforestation success in South Korea. In addition, the mobilization of people and police force by a strong and determined leader (non-forestry factors) for the protection of forest and tree planting under the 'Saemaul Movement' (new village/community movement) has contributed significantly to the green miracle demonstrated in South Korea.



In the 1960s, rural poverty was identified as main cause of deforestation and about 24,000 green villages were supported by government for the production of seedlings to support livelihoods of communities (poverty reduction) and reforestation across the country.

However, the South Korean model has commenced with a failure - poor post plantation management resulting in low survival was identified as a crucial bottleneck for rehabilitation of forest in the early times. As a result, serious attention was paid to each planted tree under the program named "tree examination" (examining and follow up of tree growing process). The use of coal in 1973 as new fuel source for cooking and heating (as substitute to fuelwood) across the country has also been attributed to successful forest rehabilitation in South Korea. Widespread use of coal as a substitute for fuelwood was made possible due to the economic growth. Awareness level of forest benefits has increased and the number of tree planted by an individual was considered as an act of patriotism and a source of pride for an individual Korean.

Ultimately, a **strong policy and legal framework** and its implementation by a stable and capable institutional structure, under the framework of a national forest master plan are considered forestry devices that has led the country to successful forest rehabilitation. Furthermore, non-forestry factors- such as strong political will and commitment of political leaders combined with nation-wide mobilization of the population through the Saemaul Movement has made the forest rehabilitation process transformational in South Korea. South Korea is a country that has achieved strong economic progress together with transformed green landscapes that was made possible with a vision of creating a green and wealthy South Korea.

Policy, Institutional and Legal Instruments

The Republic of Korea has successfully transformed its denuded land into rich forests in less than half a century because of its strong forest policy and proper implementation. South Korea has set and implemented forest policy that was intended to ensure forestland recovery and wood supply, forest rehabilitation and sustainable forest management. The government enforced the policy through a series of National Forestry Development Plans (NFDPs) which have been successively generated and coordinated by the Korean Forest Service, which has evolved according to national needs (rehabilitation, sustainable wood production and multiple benefits of forests):

- The **first post-war plan** focused on forestland recovery and wood supply (before the 1st National Forestry Development Plan (NFDP): 1953–1972)
- **The next three plans** run under Forest rehabilitation program (1st, 2nd and 3rd NFDPs: 1973–1997); and
- **The ensuing plan** focused on sustainable forest management (4th and 5th NFDPs: 1998–2017).

Policy, Institutional and Legal Instruments

Phase I

Post-War Forestland Recovery and Wood Supply (1953–1972)

After the Korean War, an increasing population boosted food and energy demands, which in turn led to the conversion of forestlands into

agricultural lands and the excessive exploitation of fuelwood for energy. The South Korean government implemented a forest protection policy to decrease deforestation and forest degradation. The government enacted several acts to realize the successful implementation of the policy:

- The **Forest Products Control Act** of 1961 regulated gathering and extracting products in the mountains.
- The **Abolishment of Slash-and-Burn Fields Act** of 1966 which prohibited slash-and-burn cultivation.
- A **Forest Law** was formulated and enacted in 1961. The law was intended to promote forest protection and forest development and to enhance forest productivity and public functions. Among other things, the law emphasizes the utilization of forest resources, conservation of natural forests and management of national forests.
- The **Erosion Control Act** was enacted in 1962 to restore denuded forestlands and effectively control erosion.

Phase II

Forest Rehabilitation (1973–1979)

After the legal and institutional preparations in the 1960s, the Forest Rehabilitation Projects were initiated in 1973. During the 1st NFDP, from 1973to 1978, erosion control works were conducted in a total 41,932 ha. The government declared the Nationwide Tree planting period (21 March–20 April) and Arbor Day to encourage active public participation. With public participation during the 1st NFDP, 1.08 million ha of denuded forest were eventually restored with fast-growing tree species.

The 10-year project was completed 4 years in advance of its 1982 target. The 1st National Development Plan prohibited slash-and-burn (SAB) cultivation to address the major driver of deforestation and forest degradation in the country. Korea Forest Service (KFS) tried to secure the livelihood of poverty-stricken slash-and-burn farmers. Therefore, KFS allocated 69.9% of the total budget for forestry towards the abolishment of slash-and-burn fields from 1974 to 1979 to provide security for SAB cultivators—38.3% for the reallocation of households and 31.6% for livelihoods support. SAB households were compensated for relocating with 0.2 to 0.5 million Korean won (413 to 1033 USD) per household from 1974 to 1979.

According to the Abolishment of Slash-and-Burn Fields Act the government provided farmers who left their SAB fields with arable lands and housing. The abolishment of SAB fields and the associated compensation for household relocation contributed to South Korea's successful forest restoration. The 2nd 10-year National Forest Development Plan (1979–1987) aimed to establish large-scale commercial forests that could be developed into sustainable timber resources for domestic timber demands. The government implemented various strategies such as the foundation of forest development funds to support private and national forests. Along with reforestation projects, erosion control was also actively undertaken to prevent natural disasters on commercial forests. Advanced biotechnology was also adopted to control forest diseases and pests. Under the 2nd National Forest Development Plan, 1.06 million ha of forests were established. Likewise, the 3rd National Forest Development Plan (1988–1997) aimed to harmonize the economic functions and public benefits of forests. The plan focused on establishing forest management infrastructure (e.g., forest road construction, forest mechanization, and education for foresters and forestry workers). Shifting its focus towards the economic functions of forests, this plan embodied a transitional phase in South Korean forest policy.

Phase III

Sustainable Forest Management (1998–2013)

The third phase of South Korean forest policy was oriented toward Sustainable Forest Management (SFM). The 4th National Forest Development Plan (1998–2007) entered a transitional phase in forest policy, shifting its primary focus from economic functions to enhancing multiple benefits of forests (e.g., public and recreational benefits). The 5th National Forest Development Plan (2008–2017) aimed to realize a nation that focuses on forest goods and services from sustainably managed forests. The plan includes five key strategies:

I. **Integrated management** and development of multi-functional forest resources;
II. **Forest industry promotion** for the sustainable use of forest resources;
I. **Conservation and management of forests** as national environmental resources;
II. Increasing **green areas and services** for the public; and
III. **International cooperation** for global forest conservation and timber supply.

Urban forest policies have been introduced in South Korea since the late 1990s. In accordance with the Creation and Management of Forest Resources Act of 2005, the KFS established a basic plan for urban forests (2008–2017) in 2007. Following the plan, central and local governments were constructing and managing various types of urban forests (e.g., street trees, urban parks and school forests). As of 2011, a total of 10.8 million seedlings have been planted, and 957 school forests have been created.

South Korea Framework Act on Forest

South Korea replaced the 1996 Forest Act with the Framework Act on Forest in May 2001. The Framework Act on Forest stipulates basic objectives and structure of forest policies for development of various forest policies. The Framework Act on Forest relates to fundamental forest and forestry law in South Korea and has 7 chapters and 30 articles. This act provides basic directions for policies relating to forest resources, mountainous district management, forest protections and normative criteria that can be commonly applied to each forest stand.

The Act on Forest plays a significant role as a fundamental law which offers background and normative standards for enacting other forest laws in the system of forest legislation. As of March 2014, there are 18 acts, 18 executive orders and 17 ordinances under the Korea Forest Service's jurisdiction. The Framework Act seeks to not only to improve the nation's quality of life but also to develop the nation's economy. Interestingly, the Framework Act includes articles that states national and local governments shall conduct investigations and research regarding forest policies necessary to strengthen international cooperation toward conservation of the earth's forests. According to this act, KFS shall establish and implement basic and regional forest plans to help systematically realize SFM based on the long-term prospects. Basic and regional forest plans shall be established using district units. However, to instill forest management flexibility, certain areas are bound to an integrated management unit along with eco-system and economic characteristics.

Basic and regional forest plans will be established every ten years. It also emphasizes that state and local governments should establish and implement policies for reforestation and silviculture to promote SFM, considering regional specificity to promote the public functions of forests (e.g., forest protection and recreation). State and local governments shall establish and implement necessary policies to provide citizens with recreational places (e.g., constructing various forest recreational facilities) and with

knowledge and information on forests to promote forest culture.

For the purpose of improving forest functions to promote economic benefits, state and local governments shall establish and implement policies to improve forestry productivity and to enhance forest management capabilities in the administrative structure. In particular, to secure the timber supply, the state shall establish and implement policies to develop overseas forest resources (e.g., assistance with overseas forest plantations), which emphasizes international forest cooperation to improve the economic benefits of forests. In addition, this act includes policies to promote mountain villages.

Institutions and Forest Management

Despite the introduction of the forest protection policy in 1950s, illegal logging was not controlled. From 1945 to 1961, the frequency of illegal logging was 24,085 cases, and the average volume of illegally logged timber was 92,853 m3 per year. There was also a pressure from Slush-and-burn which was not completely abolished until 1970s. Recognizing the importance of forest rehabilitation and strengthening forest policies, the Forestry Bureau under the Ministry of Agriculture and Forestry (MAF) had to be expanded for effective and efficient enforcement. To strengthen forest administration power, **the KFS was created as a national forest administration agency** under the MAF in 1967.

The KFS has the overall responsibility for the establishment and implementation of forest policies and laws. The KFS consists of 5 bureaus, 26 divisions, 5 Regional Office of Forest Service and 27 National Forest Stations. It also has affiliate agencies like the Forest Aviation Headquarters, National Institute of Forest Science, the National Arboretum, and the National Recreation Forest Office. Each province and metropolitan city has their local forestry administrative organizations. KFS has five regional offices: Northern, Southern, Eastern, western and central regional offices of forest service.

South Korea Forest Resource Base

The total forest area in South Korea is 6,370,304 ha, 64% of the total area of the country. Three forest types are recognized:

I. Coniferous forest - pine forests - 42%,
II. Broad-leaved forest - 26% and
III. Mixed forest - 29%.

Forests in South Korea are managed sustainably (SFM) for economic benefits while contributing to diverse ecological services. About two-third (68%) of the forest in South Korea is owned by individual holders with economic interest on their forest resources. About 24% of the forest is a national forest while 8% is public. The Korean Forest Service sets regulations for forest resources management while individual owners manage their forest resources. Government entities (national or provincial) manage the rest of the forest resources in the country for various purposes. Timber harvesting, recreation, carbon storage and sequestration, water regulation, flood and landslide control, are the major functions of forest resources in South Korea.

Forest products extracted from the forest resources in South Korea are timber, fruit and nuts, wild vegetables, medicinal plants, and mushroom with an annual economic output of about 7 billion USD. Public benefits emanated from the Reforestation activities and Sustainable Forest Management has steadily increased from USD 1 billion in 1990 to USD 60 billion 2010 in South Korea.

Recently, the total appraised value of forest functions and the public benefits in South Korea was estimated at about USD 100 billion, having increased by 49% compared to 2008 estimate. The appraised value is 9.3% of GDP, or 3.9 times the total production output of agriculture, forestry and fishery, 19.7 times the total production of forestry, and 68 times the budget

of the KFS (KRW 1.6 billion). In recent forest resource development, the environmental value of forest resources is continuously developing, and items with new functions are recognized and added along with the development of tangible products such as timber, fuel-wood and short-term forest products.

As per the evaluations conducted by the Korea Forest Research Institute in 1987,1995 and 2010 the monitoring values of the ten functions of the forest resources are depicted here under:

- Watershed conservation is USD 18,541,467 million
- Water-purification is USD 6,606,789 million
- Prevention of forest soil erosion is USD 13,152,110 million
- Prevention of forest landslide is USD 6,140,183million
- Forest recreation is USD 13,400,642 million

Korea demonstrated that investing in forestry is very rewarding. In 2011 the country invested 2.0 billion USD which generated 100 billion USD of which reduced medical costs was 2.4 billion USD, public benefits USD 70 billion USD and forest products USD 4.7 billion.

Lastly, forest fire monitoring and protection of forest resources is an important aspect of forestry activities in South Korea and forest fire protection is a high tech and intensive activity. The National Forest Aviation Centre located in Daejeon, is responsible for forest fire prevention measures and fire suppression. South Korea has an intensive fire monitoring and suppression system supported with 11 aviation centers, 47 helicopters, 151 surveillance cameras and 12,000 firewatchers across the country. Fire is a threat not only for forest resources but also for the population that live in crowded situation across the forest areas.

Korea's Approach for Reforestation-Success Factors

South Korea, forested land area has almost doubled in size since the mid-1950s, with 64 percent of the country now covered with forests. The increase in forest cover was mainly accomplished through a government-led effort aimed at recovery of degraded lands during the Japanese occupation and the Korean War. Historical records from 1927-2007 showed a turnaround in forest cover trends from net deforestation to net reforestation. Understanding the dynamic forest transition in South Korea provides a starting point for other developing countries, such as Ethiopia, to develop strategies to recover its forest conditions.

The reforestation of degraded lands following in the early 1950s occurred mostly as a result of natural vegetation recovery through enforced policies on illegal logging and shifting cultivation. This was supported by a nationwide afforestation program of about 1.4 million hectares through plantations to recover the growing stocks.

The increased use of coal, economic growth and urbanization further contributed to forest recovery efforts by reducing the demand for firewood, which had until then been the biggest cause of deforestation in South Korea. Also in the 1970s, the Ministry of Internal Affairs oversaw reforestation efforts through directing local governments to lead tree-planting efforts across 1 million hectares, and encouraging villagers to build tree nurseries and sell seedlings for the reforestation program. The second National Forestation Plan, implemented in the 1980s, focused on rehabilitating degraded lands by establishing 1 million hectares of commercial forests with long-rotation species, rather than fuelwood forests. The President at the time, Park Chung-hee declared reforestation to "turn bare land into a green nation."

The core success factors that supported forest recovery of South Korea were external to the forestry sector. **Korea has a long history of a strong communitarian culture**, where mountainous forests were viewed as common-pool resources as well as sacred places. Forestry and non-forestry related success factors in the Korean afforestation program include:

High-Level Political Commitment- President Park, considered as a patriarch leading the country through a difficult period was committted to reforesting the denuded landscape, and made forest rehabilitation a top government priority. To achieve this, President Park integrated this goal into other government programmes, such as the 5-Year Economic Development Plan, 'Saemaul Undong' New Village Movement, and the National Comprehensive Development Plan. The ROK's political system during Park's leadership was a centralized presidency, which gave the president a great deal of authority. By prioritizing forest rehabilitation, making personal visits to the fields, and including forest officials in monthly economic briefings, President Park's actions had stronger effects than any other institutional strategy.The president continuously announced in speeches 'cutting trees is evil, and planting trees is patriotism' and the government reinforced this ideology every chance it had. Tree-planting was understood to be the responsibility of the entire country. This included all citizens, not just forest owners. For the most part, the government led efforts to create forest management plans, prevent and suppress fires, and control insect pests and diseases. Other politically influential champions include Ministers who have made the National Reforestation Programme a national priority through the concept of Saemaul Undong. Ministers showed great interest in reforestation and supported the KFS by providing whatever it required (i.e.mobilizing the police force to deal with forest related crimes, recruiting forest personnel, and securing needed budget). The Ministry of Home Affairs (MOHA) especially concentrated on encouraging rural people to participate in the Programme and advocating conservation of forests to the public. The man behind the First Plan was then Forest Minister of the KFS, Son Su Ik. The KFS under Forest Minister Son from January 1973 to September 1978 established accurate, efficient rehabilitation plans, achieving the targets set under the First Plan in only 6 years. Forest Minister Son established interlinked-cooperative framework for forest-related policies using his strong leadership. He also ran a very strict supervisory administration with a great deal of field guidance and assessments and provided critical support to forestry officers by providing new professional opportunities when appropriate.

Institutionalization of Forestry Administration- Korea's forest administration began as a bureau. However, the bureau had not shown any progress towards reforestation half a decade after its establishment. As a result, President Park reorganized the KFS under Ministry of Home Affairs (MOHA). By combining the regional administrative power and police force of the MOHA with the technical expertise of the KFS, forest rehabilitation was effectively initiated. To implement the First Plan, the government mobilized and coordinated the administrative power of everycentral, province, county/city, and village unit. Forestry cooperatives were organized in every village and region, supported government policies by undertaking reforestation activities and educating forest owners.

The KFS Forestry Experiment Station and Forest Genetics Research Institute supported the forest rehabilitation policies- by offering technical expertise in forestry and forest technologies to local communities. This included selecting tree species for reforestation, developing erosion control technologies, and developing forest resources to increase income o frural villages. At the same time, stricter government policies cracked down on illegal logging and slash-and-burn practices by controlling access to forests and increasing law

enforcement.The government has trained many forestry experts and officials for rehabilitation, starting with Seoul National University, which established the Department of Forestry immediately following liberation. Since then, there have been more than 20 forestry departments established at Korean universities, training approximately 1,000 forestry experts each year. The Forest Research Institute, Forest Genetics Research Institute, and Forest Training Institute were established under the KFS for forestry education and research. At the provincial/county level offices, forestry bureaus and departments were established for administrative purposes. The forest cooperative association placed around 700 forestry experts at the local cooperatives to train citizens on tree planting and tree-tending techniques.

Promotions to forestry organizations and officers to reward participation in forest rehabilitation projects- Forest divisions of each province were promoted to forest bureaus, forestry department of each county was promoted to forest divisions, and about two hundred forest officers were promoted. These promotions motivated officers to actively participate in the National Reforestation Programme.

Integrated Approach- The National Reforestation Programme was integrated into multiple government programmes, including the 5-Year Economic Development Plan and National Comprehensive Development Plan. It was also integrated into fuel-wood-policy measures for rural villages, which was a cross-sectoral programme. Inter-agency cooperation was indispensable, and President Park personally oversaw this coordination. At the beginning of the First Plan implementation, he determined the scope of rehabilitation efforts for the year and ordered inter-ministerial coordination during the Saemaul National Cabinet Meeting. One example of this inter-agency cooperation was the nationwide tree-planting movement. Each agency played a vital role, taking responsibility for the public tree-planting movement, the provision of fertilizers, provision of military basis and facilities for the ongoing campaigns. The KFS was heavily involved in this project, providing needed materials for tree-planting, planting sites, and technical training.

This demonstrates that high level political commitments are especially important to developing countries dealing with the natural resources restoration such as forests. In this respect, the strong leadership of the President was an extremely important factor in managing successful reforestation in the Republic of Korea at the time.

Saemaul Undong had a very important role in forest rehabilitation as well, because a tree-planting project in a rugged mountainous country like the Republic of Korea is impossible without the participation of the local population. The rural villages at the time were very poor but had ample labor available. The government was able to succeed in forest rehabilitation through the continuous attention of President Park and the active participation of villagers. President Park, after identifying forest rehabilitation as the top government priority, exercised control over administrative and social organizations to establish rehabilitation projects. In this way, the president's strong leadership and ability to coordinate contributed to the success of the comprehensive forest rehabilitation project.

Continuous Economic Growth:After 1962, the Republic of Korea had accomplished continuous and rapid economic growth due to the success of the 5-Year Economic Development Plan. Compared to a GDP of USD 1.1 billion in 1953, the GDP at the time of the initiation of the First National Forest Plan (1973)was 11 times greater. It was 108 times greater in 1987 when the Second National Forest Plan was completed. As a result of this economic growth, the transition from household fuelwood use (the most direct cause of the forest degradation at the time) to fossil fuel use was possible. People could now afford to purchase briquettes or gas rather than going to the mountains to cut down trees for fuelwood.

Until the early1960s, villagers would spend all day cutting trees, but could only carry home three to four days' worth of fuel. By the 1970s, however, a daily wage could buy twenty five briquettes, which would be sufficient for a week. In other words, rising income led to a change in fuel use from wood to charcoal. Implementation of the National Reforestation Programme and the clearing project for slash-and-burn fields would not have been possible without national financing. Rapidly increasing domestic timber demands were met with imports under free timber trade and economic growth. In this way, continuous economic growth became the basis for preventing forest degradation.

The National Slash-and-Burn (SAB) Clearance Project: When the First 10-Year Forest Rehabilitation Plan was implemented in 1973, around 300,000 households were still practicing slash-and-burn agriculture impacting 125,000 ha of forest, which was 1.3% of total forest land. Although the size seemed small, shifting cultivation took up about 13-14% of agricultural activities in the Republic of Korea at that time. Slash-and-burn farmers cultivated without applying fertilizers after burning all plants. Such extensive agriculture was a major cause of forest degradation. Moreover, unimaginable damage could be caused if these burns resulted in forest fire. The clearing of the slash-and-burn fields was one of the major goals, along with conversion of household energy sources and large-scale reforestation. Despite the intensive clearing project started in Gangwon Province in 1965, the number of slash-and-burn cases continued increasing. People were still practicing it in 1973 when the First 10-Year Forest Rehabilitation Plan was implemented. This major driver of degradation slowed down from 1974 through 1979 and disappeared entirely thereafter.The main reasons for the decline in slash-and-burn fields were the drastic decrease in rural populations and continuous national support in many forms, including education and promotion.

As of 1967, rural population plummeted, making it possible for the government to convert slash-and-burn fields. Since slash-and-burn farmers were forced into this practice due to socioeconomic circumstances, clearing slash-and-burn fields could not be easily achieved unless the socio-economic circumstances changed.The outcomes of the Economic Development Plans initiated in the mid-1960s began to show positive effects by the end of 1960s. The Korean government's budget and GNP skyrocketed after turning it around in 1967. When the National Slash-and-Burn Clearance Project started in 1974, the budget and GNP

were about 25 times greater than in 1960. This provided a suitable environment for the government to successfully convert the slash-and-burn fields into forests. It was undeniable how necessary the project was for social, economic, and forestry reasons; however, without the support of the President and respective ministers for the farmers' livelihoods such a project would have been a failure. In order to ensure the success of the project, the government had to eliminate the re-farming trend. The slash-and-burn farmers were mostly responsible for re-farming done at that time. Due to extreme poverty, many farmers migrated from village to village, depending solely on slash-and-burn agriculture. Therefore, it was crucial to provide stable livelihoods for them to minimize reforestation practice.

Taking this into consideration, it was no surprise that during the National Slash-and-Burn Clearance Project, 38.3% of the total project budget was allocated to 17,643 households, which was only 6.6% of total 267,301 targeted households from 1974-1979. All targeted households experienced some income cuts regardless of amount due to the decrease of farmlands. Without compensating the income losses, the government could not eliminate returning to farming on slash-and-burn fields entirely. This clearly explained why 31.6% of the total project budget was used to support farmers with cattle farms, pig farms, mulberry fields, joint nurseries, wages, employment, farmland and other necessities. Continued support for the farmers prevented re-plantations, making the National Slash-and-Burn Clearance Project a great success.

Large-Scale Reforestation: It wasn't until after the underlying problems were addressed that the large-scale reforestation policy began to have effects. Reforestation was essential for successful forest rehabilitation. Reforestation consists of both natural regeneration and artificial planting. In the 1960s artificial planting was emphasized in order to deal with serious forest degradation, rather than relying on natural regeneration to quickly increase forest cover. In 1960 there were 2.8 million ha of unstocked land (approximately 42% of the total forest area) and 0.52 million ha of degraded land (19% of the unstocked land).Over 55 years, the Korean government planted an annual average of 97,000 ha, reforesting 5.32 million ha by 2000 (approximately, 83% of the total forest land). About 94% of total plantations were on relatively more degraded private forests. Seedling establishment failures, the lack of follow-up after planting (post planting management) and natural disasters can all result in an area requiring replanting. Despite this, there is no doubt that artificial reforestation, especially in the 1960's, had a significant influence on current Korean forests. The outcome of the National Reforestation Programme is reviewed in 5-year terms. Between 1966 and 1980, an annual average of 200,000 ha of degraded areas was reforested, with the highest rates occurring during the First and Second Plans, with the exception of 1967. In 1967, the KFS was established and 450,000 ha were planted, including the establishment of 360,000 ha fuelwood plantations. From 1966 to 1970, an average of 190,000 ha of degraded areas was reforested annually, marking the second highest record since the massive reforestation outcomes in 1967.

Reforestation from 1961 to 1970 accounted for 59% of what had been planted during the entire period. Meanwhile, reforestation outcomes from 1971 to 1980 during which time the First Plan was carried out accounted for 31% of the entire period. Since the 1980s, the rate of reforestation has decreased continually because there are less degraded forests due to the conversion of energy sources, the successful clearance of slash-and burn fields, and previous reforestation efforts. From 1983 to 2000 the average annual reforested area dropped from 100,000 to just 20,000. In this respect, the pinnacle of reforestation occurred from 1973 to 1987 when the National Reforestation Programme was most actively implemented.

Experiences from Visit to the Peoples Republic of China

Background
Institutions and Forest Management

The forest area in China accounts for 5% of world's total, ranking the fifth behind Russia, Brazil, Canada and the United States. The forest stock volume is 3% of the world's total, ranking the sixth after Brazil, Russia, the United States, the Democratic Republic of the Congo and Canada. The plantation area ranks China the first in the world. The plantation area amounts to 69.33 million ha, taking up 36% of the forested land area. The Chinese government has attached great importance to cultivation of plantation resources and taken a series of policies and measures to promote afforestation and greening work. With unremitting efforts made for several decades, China has greatly developed and expanded the plantation resources.

Bamboo Forest in China

In terms of bamboo area, potential and number of bamboo species, China is one of the richest countries in the world. China has more than 500 bamboo species in 39 genera. The number of cultivated economic bamboo species reaches 50 species. The area of bamboo forest is 6.01 million ha. The economic value generated from the bamboo subsector is about USD 19.5 billion. The Chinese people have used bamboos widely because of their easy propagation, vigorous regeneration, fast growth, high production, quick maturity, short rotation and graceful form. The particular qualities of bamboo culms- straightness, lightness, strength, hardness, high fibre content and easy workability - are ideal for different technological purposes.

The Chinese are properly conserving their bamboo resources by establishing arboretums. The arboretum is also intended to promote the conservation of endangered wild animals such as panda. Bamboo resources are vital for the socio-economic conditions of the local people and the economy of bamboo growing provinces such as Zhejiang province. Bamboo development and utilization in China is greatly supported by research findings. The Research Institute of Subtropical Forestry and Chinese Academy of Forestry are engaged in developing technologies that support bamboo development and conservation activities since 1960s. The program includes a scheduled visit to the paper industry in Fuyang district of Hangzhou city/capital of Zhejiang province. This paper industry produces packaging materials from waste paper, which the company mainly imported from USA. Such paper production from waste papers collected from different sources is vital to conserve forest resources.

Moso Bamboo Science and Technological Demonstration Park in Shanchuan village of Anji county, illustrated that bamboo management can be integrated with other livelihood interventions such as poultry production. The local community in the village uses living bamboo culms to prepare juice and alcohol. The alcohol and the juice prepared in bamboo culms have spectacular bamboo flavor which is a favorite with the local people. It was evident that afforestation and re-afforestation of bamboo is useful in landscape re-greening and beautification. The Visit in Zhejiang Yoyu Bamboo

Company showroom and factory was very important in terms of understanding the diverse products that can be made from bamboo- with different types of mats and other important materials that can be used for the day-to-day activities.

Bamboo has a huge potential as commercial non timber forest product to satisfy the demand for various forest products. Similar show room visit was conducted in ICBR (International Center for Bamboo and Rattan) in Beijing. In the visit of the show room the delegation has observed various products made out of bamboo. The products include clothes, different IT products as well as office and other household materials. The 4 days visit was completed with a meeting conducted with MmeJiang Zehui, Co-chair of INBAR Board of Trustee, Ministry of Commerce (MOFCOM), and officials from SFA, ICBR and INBAR where the cooperation in the China-Africa Bamboo training establishment and other collaborations were thoroughly discussed. China Ministry of Commence (MOFCOM) requested the Ethiopian side to develop a proposal that show details on how to run the proposed center.

Figure 3. Partial view of Bamboo forest

In terms of bamboo area, potential and number of bamboo species, China is one of the richest countries in the world. China has more than 500 bamboo species in 39 genera. The number of cultivated economic bamboo species reaches 50 species. The area of bamboo forest is 6.01 million ha.

Figure 4. Partial view of Bamboo forest

The Chinese people have used bamboos widely because of its easy propagation, vigorous regeneration, fast growth, high production, quick maturity, short rotation and graceful form. The particular qualities of bamboo culms - straightness, lightness, strength, and hardness, high fiber content and easy workability - are ideal for different technological purposes.

Anji county of Zhejiang province

Anji Country is located in the northwest of Zhejiang province, which is the rapid development economic zone of the Yangtze River Delta. Bamboo product is the most important special product of Anji.

Anji County has more than 57,000 ha of bamboo forests in total, accounting for 51.27% of the forested lands. The county produces 0.45 million tons of bamboo timber and 0.03 million tons of bamboo shoots. Among them the area of Moso bamboo was 45,000 ha, with a total standing volume of 114.6 million stocks, a stocking density of 2,574 individuals per ha and an average diameter at breast height of 8.03 cm. The annual harvesting is 18 million individuals, equivalent to 300,000 tons approximately. The average annual production of bamboo timber is about 6,750 kg per ha. There are about 160,000 ha of high yielding bamboo forests with an annual over production of more than 7,500 kg per ha, accounting for approximately 35% of the total area if Moso bamboo forests. The county has a total of 46 bamboo species (including varieties

and forms), respectively belonging to t7 genera, namely Phyllostachys, Pleioblastus, Sinobambusa, Indocalamus, Chimonobambusa and Brachystachyum.

In Anji, there are 28 cooperative farms owned by townships and 140 village-owned farms. These farms are staffed by 716 employees who fall under the supervision of the respective township and village authorities. The Forestry Department of Anji County is ultimately responsible for collective farms, as it supervises harvest planning and implementation, monitors harvesting operations, introduces new techniques, and provides technical training. It also formulates investment plans and manages the farms' plantation fund that helps sustain bamboo production development.

Production and Utilization of Bamboo in Anji

China is a country with great potential for bamboo production and utilization. The bamboo industry revenue has become the main source of the farmers' income in Anji. The bamboo goods are well sold at home market and international market.

Anji County has more than 57,000 ha of bamboo forests in total, accounting for 51.27% of the forested lands. The county produces 0.45 million tons of bamboo timber and 0.03 million tons of bamboo shoots. Among them the area of Moso bamboo was 45,000 ha, with a total standing volume of 114.6 million culms, a culm density of 2,574 culms per ha and an average diameter at breast height of 8.03 cm. The annual harvesting is 18 million culms, equivalent to 300,000 tons approximately. The average annual production of bamboo timber is about 6,750 kg per ha. There are about 160,000 ha of high yielding bamboo forests with an annual production of more than 7,500 kg per ha, accounting for approximately 35% of the total area of Moso bamboo forests.

Anji has a total of 46 bamboo species (including varieties and forms), respectively belonging to 7 genera. In Anji, there are 28 cooperative farms owned by townships and 140 village-owned farms. These farms are staffed by 716 employees who fall under the supervision of the respective township and village authorities. The Forestry Bureau of Anji County is ultimately responsible for collective farms, as it supervises harvest planning and implementation, monitors harvesting operations, introduces new techniques, and provides technical training. It also formulates investment plans and manages the farms' plantation fund that helps sustain bamboo production development. The state-owned forest farm, under the Forestry Bureau, is the smallest unit of bamboo forest management.

China is a country with great potential for bamboo production and utilization. The bamboo industry revenue has become the main source of the farmers' income (60%) in Anji. The bamboo goods are well sold at home market and international market.

Figure 5: Different bamboo products

Research Institute of Subtropical Forestry

The vast scale of afforestation in China provides a wide scope for research in, and application of, all aspects of tree improvement.

The following professional institutions are engaged in forest tree improvement in China:

I. International Center for Bamboo and Rattan and the Research Institute of Sub-tropical Forestry Institute under the Chinese Academy of Forestry;
II. Teaching and research sections in forest tree breeding in the Northeast China College of Forestry, Beijing Forestry College and Nanjing Forestry College; University, Central-South Forestry and Technology University, North-West Agriculture and Forestry University and Zhejiang Agriculture and Forestry University etc
III. Forest Tree Breeding Research Departments in the Forestry Research Institutes in Guangdong, Jiangxi, Jiangsu, Sichuan, Hunan, Heilongjiang provinces; and
IV. Tree breeding research groups in all other provincial Forestry Scientific Institutes.

Chinese Academy of Forestry involves 21 Institutions in 10 provincial areas. Total staff of the Research Institute of Subtropical Forestry is 170 of which 140 are scientific staff and 100 are PhD, candidate. Main research areas are: Introduction of exotic trees; Provenance testing; Seed orchards; Hybridization; and Tissue culture etc.

Mission of the institute:

- Specialized institution on forest silviculture and forest ecology
- To identify forestry problems and find solutions to them in subtropical areas of China

Major research areas:

- Forest silviculture and forest ecology: Covering major species with economic or ecological importance in Subtropical areas.
- Conservation, evaluation and improvement of genetic resources.
- propagation and plantation management.
- Breeding: The 3rd generation breeding population: Productive pulping stand of P. masonianaestablished with genetic improved seeds; P. elliottee: Plantations established with improved seeds (for timber and resin production) Chinese fir: Plantations established with genetic improved clonal varieties.
- Forest Ecology: Selection of salt-tolerant tree species
- Reforestation on degraded land: Reforestation from farming: Farming on steep slopes along Changjiang River, resulting in serious soil erosion.
- Bamboos Genetic Improving: Cross-breeding- a) Techniques for callus induction and somatic embryogenesis of monopodial and sympodial bamboos are established; b) Techniques of Vegetative Propagation; c) Bamboo Tissue Culture; d) Bamboo Sustainable Management; e) Bamboo Agro-forestry; f) Insect Pest Control Research.

Urban Forestry in China

In China, over the last 20 years, a rapid process of urbanization has taken place due to increasing economic development. Between 1983 and 2003, the number of cities and towns in China increased 2.5 times to about 50,000, and the urban population reached the level of about 40% of the total population in the country.

Since the 1980s, developing urban forests has become an important part of municipal planning as a whole, and urban forests have been established according to a design which is based on the need for recreation opportunities and environmental protection. In 1989, Changchun, the capital of Jilin province, began to carry out a programme of developing a "forest city", thus being the first city to aim for this ambitious goal on city development. In 2001, the planning of urban forest development was worked out for Shanghai, the biggest city in the country, with the goal of reaching 35% forest coverage by 2020.

The major share of funding for managing urban forests comes from governments. However, governmental funding alone is not enough to satisfy the urgent need for planting new trees and forests in many cities. Generally, private companies are not interested in forest management, mainly because it does not deliver direct and fast economic benefits. Developing urban forests in China requires strengthening research on urban forestry theory, technology, and policy making.

Bamboo production and utilization in China

Bamboo as a commodity can be used for a variety of purposes.

- Bamboo Shoots : Dry shoot, shoot canned, soft package keeping fresh shoot, ready shoot food, healthy and nutritious food
- Bamboo Culms: **Craft Product**: Artificial products, Handicraft articles, Furniture, and tools; **for Construction**: Bamboo house, Construction frame, Cement products, Ornamental material; and **Industrial Products:** 1) Artificial board (including plywood/chip board, veneer covers, sandwich mat board, particle or fiber board) Bus floor board, for construction work, package board, etc. Use of wood board in furniture, package, construction and ornament or decoration. 2) Parquet (including radial parquet, horizontal parquet, bamboo mosaic, vertical cut parquet) and **Other Products:** Paper making/pulp, bamboo rayon, triacetate, artificial fiber, disposable sterilized chopsticks, incense stick, tooth pick, cotton swab, bamboo table ware, etc.
- Bamboo Juice: Medicinal bamboo drip; Bamboo juice drink, soft drink, bamboo wine, etc.

KEY LESSONS LEARNED

Lessons Learned

Critical lessons from South Korea and China within the scope of the successful National Reforestation Programme and Bamboo production and utilization plans respectively are:

01

First lesson learned

Continuous support from the President of South Korea accompanied by forest rehabilitation and therefore becoming top government priority has been critical for the success of South Korea. President Park has led the planning, implementation, and coordination of the Programme and he has transformed the KFS into a more effective implementing and coordinated administrative institution. Similarly, he ensured that the programme is well integrated with other government projects - such as the 5-Year Economic Development Plan, Saemaul Undong (cultural reform), and the National Comprehensive Development Plan. Once forest rehabilitation became the top priority government project, national finance could be channeled directly into the Programme.

02

Second lesson learned

Central and regional administrative/technical powers were mobilized for the reforestation, erosion control, and clearing of slash-and-burn fields. Police forces were mobilized for forest protection. This leads to the conclusion that developing countries need strong and committed leadership is required to put forestry issues on the top of the national agenda.

03

Third lesson learned

It is critical that the government diagnose the underlying causes of deforestation, and establish a comprehensive plan to address these issues. The South Korean government identified direct drivers early on, such as household fuelwood use, illegal logging, and slash-and-burn fields, and understood that the underlying cause for all of these drivers was poverty. The government successfully initiated the 5-Year Economic Development Plan in 1962 to alleviate poverty. With economic growth, fuelwood was no longer the primary energy source for households, and

with the rural population migrating to urban areas, pressures on forests causing degradation decreased. Challenges like the prevention of illegal logging, the clearing of slash-and-burn fields, and creation of forest resources were solved through the establishment of the comprehensive Forest Rehabilitation Programme, with the support of administrative, police and technological structures at the national level. Even with allow income level and enforcement of strong governance framework,government efforts can overcome forestry challenges. South Korean afforestation success has targeted on the critical drivers of deforestation (e.g. slash and burn agriculture, fuel wood demand) anchored through appropriate alternative opportunities.

04

Fourth lesson learned

With clear policy objectives, continuous promotion is needed to bring about the capacities, and fulfill the needs and interests of the citizens. South Korea at the time had been suffering through natural disasters such as drought, flood, and soil loss every year. With the visible growth in the industrial sector, the denuded forests became the top priority of the government. The government announced its quantitative reforestation goal of one million ha within the First Plan, along with its long-term vision of complete reforestation. Due to awareness raising, the nation acknowledged the necessity and supported the government's decision because of shared vision. The government emphasized and reinforced the ideology that 'planting a tree is an act of patriotism' with the aim of developing a nationwide tree planting movement. Every year the government chose a targeted area for planting in January and February. Then in March, it starts advocating for the needs of forest rehabilitation and forest protection through each ministry by training local populations and promoting through the mass media. This promotion reached its peak every year on April 5, National Arbor Day

05

Fifth lesson learned

There were unintended consequences of the 1970s National Reforestation Programme. 'The **Absolute Greening** summed up the reforestation policies of the period perfectly. As the name implies, during the 1970s, the government and public took the lead in the tree-planting without taking the forest owners preference of tree species into consideration. As a consequence, most forest owners ended up relying on government-led reforestation policies and grants, rather than taking a stance on matters concerning their forests. In later years, establishing cooperative governance between the government-led National Reforestation Programme and stakeholders became one of the programme's top priorities. The Forest Rehabilitation Plans achieved its goal successfully and the success has spread to several different sectors showing positive outcomes like land restoration, flood prevention, recovery of biodiversity, and an increase in water supply and recreational forests. Forest is the most representative terrestrial ecosystem in South Korea and against this backdrop, reviving forests meant restoring forest ecosystems. Continuous success with the Forest Rehabilitation Plans became the driving force behind sustainable economic growth and improved quality of life for the nation.

06

Sixth lesson learned

Equally critical is the role of the Forest Rehabilitation Plans in initiating SFM. With restored forest ecosystems, the volume of forest resources grows, and so does the quality of life for wildlife species and humans that rely on forests for their livelihood. Moreover, the success in South Korea had positive effects on biodiversity and securing forest water resources. Forests not only offer ample economic opportunities for people, but provide them with recreational services. The more a society and its economy develop, the more forests become a part of popular culture. These are only examples of the benefits which are provided by forests. In other words, the successful implementation of the Plans was a significant stepping stone for SFM, allowing forests to function ecologically, economically, socially, and culturally.

07

Seventh lesson learned

Korean forest service has strong organizational structure (from national to district level) and very important centers (research, seed, training) that guarantee the sustainable forest management and utilization in the country. For instance the National Forest Seed and Variety Centeris a modern seed research and service system that are working to create a green-wealthy country through forest plant variety protection & high quality seed production. High technology of seed testing and protection laboratories, quality seed and genetically improved seed orchards of 702 ha seed orchards (clonal and seedling) of different tree species. They are working on genetic conservation of forest species as well. Furthermore the Korea Forest Research Institute (National Institute of Forest Science) has set and implemented R&D strategies and has well organized research departments, division and research centers. The staffs of the institute mainly compose highly qualified (PhD) researchers representing 73 % of the total staff. Under the Division of Forest Tree Improvement the Forest Tree Breeding have achieved significant achievements on intensive selection and high tech breeding programs. Lastly, the Forest Training Institute is working towards being a World-class Forest Education Organization focusing on strengthening professional education for forest improvement, capacity based education for career development and expansion of International Education for Earth Environment Conservation.

08

Eighth lesson learned

The economic and public benefits emanated from the forestry activities has been documented and valued properly to steadily guide the Sustainable Forest Management system of South Korea whereas forest products processing has been efficient method through which to utilize the finest possible product and maximize investment returns.

09

Ninth lesson learned

China has successfully focused on bamboo production which triggers critical lessons. The Research Institute of Subtropical Forestry in China has advanced research facilities and

laboratories and very qualified research personnel. Research areas have focused on the major challenges of the country and they have conducted very advanced silvicultural and tree improvement researches whilst obtaining significant achievements.

10

Tenth lesson learned

There is a huge potential of bamboo as commercial NTFP to satisfy the demand for various forest products. The diverse roles of Bamboo resources for the socio economic conditions of the local people of bamboo growing provinces such as Zhejiang province are noted as significant. The possibility of integrating bamboo with other livelihoods such as poultry production is equally important.

Conclusion

Despite their economic and ecological importance, Ethiopian forests are under threat today and the country's growing population will require more wood, fuel and food in the future. These demands, in turn, could significantly accelerate deforestation and forest degradation. Projection in the CRGE Strategy indicate that without action to change the country's development path, 90 thousand square kilometers (56% of total forest area) might be deforested between 2010 and 2030. Over the same period, annual wood fuel consumption could rise by 65%. Until now, the common understanding, based on measured GDP statistics, had been that about 4% of national income was attributable to forests (the exact share was estimated (MOFED, 2015) to be 3.8% in 2012-13).

However, the more comprehensive assessment undertaken by the ministry in collaboration with partners in 2014/2015 shows that this figure is higher than estimated. This estimation of the value of the forest resources of the country to the national socio economic development can be achieved if we control the alarming deforestation rate and in adequate afforestation and reforestation activities.

The lessons obtained through this learning exchange to South Korea and China are considered as a stepping stone to move forward the Ethiopian Forest sector to the next level. The lessons learned and accumulated experience from the sharing of knowledge with both South Korean and Chinese counterparts are instrumental in creating a strong forest sector development plan that realize enhance social, economic and environmental benefits at local and national contexts.

To that end, the Ministry, Regional States and development partners are committed that the lessons related to legal and institutional set up are to be compiled and used in the design of forest sector development program in Ethiopia.

Secondly, a national Forest sector development program will be soon designed at national level and subsequently for each region in Ethiopia so that the lessons could be integrated to the wider roadmap.

A joint MOU for further engagement and a long-term partnership on scaling up best practices, technology transfer, and further sharing of knowledge and experiences have been signed by Ethiopia and South Korea with the aim of implementing forest sector development plan, with UNDP and UN-REDD technically supporting the implementation of the MOU. .

International Network for Bamboo and Rattan (INBAR) could play an important role for the

establishment of China Africa Bamboo Center, develop national forest/bamboo sector development strategy/plan and promote national bamboo resource development and industry.

Photos: *Government of Ethiopia and Korea*

Editor: Government of Ethiopia, UNDP, UN-REDD Africa

Acknowledgements

The Ministry of Environment, Forest and Climate Change would like to thank all partners who contributed to the realization of this mission in South Korea and China. In particular, we would like to recognize the efforts of the following institutions: The Korean Forest Service and its subordinate institutions, Administrations of Zhejiang province and Anji county in China, the UNDP, the World Bank, UN-REDD, INBAR, South Korea embassy in Addis Ababa, China embassy in Addis Ababa, and Ethiopian embassies in South Korea and China.