



NON-TIMBER FOREST PRODUCTS IN KOREA

NON-TIMBER FOREST PRODUCTS IN KOREA

Don Koo Lee • Pil Sun Park

NON-TIMBER FOREST PRODUCTS IN KOREA



Asian Forest Cooperation Organization

Don Koo Lee • Pil Sun Park

AFOCO



AFOCO

NON-TIMBER FOREST PRODUCTS IN KOREA

edited by
Don Koo Lee • Pil Sun Park

NON-TIMBER FOREST PRODUCTS IN KOREA

Copyright © 2024 Don Koo Lee
Printed in Seoul, Republic of Korea

Asian Forest Cooperation Organization
12F. SIMPAC Building, 52, Gukjegeumyung-ro Yeongdeungpo-gu,
Seoul 07330, Republic of Korea

www.afocosec.org Tel. : +822 785 8970

All rights reserved. AFoCO welcomes and encourages the use and dissemination of the material in this knowledge product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that full acknowledgment of AFoCO as the source and copyright holder is given and that AFoCO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation of rights, and for resale and other commercial use rights should be addressed to contact@afocosec.org

ISBN 979-11-92009-51-3 (hard copy)
ISBN 979-11-92009-52-0 (electronic copy)

Congratulatory Message

I am delighted to extend my heartfelt congratulations to the authors, Prof. Don Koo Lee and Prof. Pil Sun Park on the successful publication of the book 'Non-Timber Forest Products in Korea.'

The publication of this book by the Asian Forest Cooperation Organization (AFOCO) is a significant milestone that highlights the importance of non-timber forest products in Korea. This book will undoubtedly serve as a valuable resource for researchers, policymakers, and stakeholders in the forestry sector.

The unwavering commitment to promoting sustainable forest management and conservation through this endeavor is truly commendable. Through initiatives like this book, you continue to inspire others and contribute to the advancement of forestry practices in Korea and beyond.

I extend my sincere appreciation to the authors for the hard work and dedication in bringing this project to fruition. I am confident that 'Non-Timber Forest Products in Korea' will make a meaningful impact and contribute to forest conservation and management of the country.

Chongho Park
Executive Director
Asian Forest Cooperation Organization

Foreword

Forests play a crucial role in providing essential goods and services to humans, animals, and other living components, serving as the habitat for terrestrial life. However, with the increasing demand for agricultural land, road construction, and urban expansion, forest lands, especially mountainous regions, have faced extensive degradation, with global annual deforestation rates reaching 6 to 10 million hectares.

In today's world, forests have gained even greater importance, not only for their direct benefits, such as wood, pulp, and paper, but also for their cultural and spiritual significance, offering recreational and healing opportunities that contribute to human well-being. In particular, there has been growing attention to non-wood forest products (NWFPs) or non-timber forest products (NTFPs) in regions like Asia, Africa, and Latin America. In Korea, NTFPs have emerged as crucial sources of income and health-promoting foods, leading to support initiatives from federal or local governments for individual farmers or cooperative groups interested in cultivating these valuable resources.

Since July 2014, Prof. Yong Shik Kim and Prof. Don Koo Lee have been co-teaching "Forests and Short-term Income" to graduate students at the Park Chung Hee School of Policy and Saemaul (PSPS) of Yeungnam University (YU). Through collaboration with officials from the Korea Forest Service as well as help from Prof. P. S. Park, we have decided to compile our teachings into a textbook focusing on "Non-Timber Forest Products in Korea." Special appreciations are given to Mr. Yongjin Kim, Mr. Joonsan Lee and Mr. Kyungsoo Ha for their help.

This textbook delves into forest resources that serve as lucrative income sources within a short period, primarily focusing on NTFPs. Throughout the teaching period from 2014 to 2019, the course covered various NTFPs in Korea, including fruits/nuts, tree saps, mushrooms, wild greens, wildflowers, and medicinal herbs. However, while ornamental trees and bonsai taught by Prof. Kim in the classes, these topics are not included in this text. Additionally, the topic introduces forest farmers in Korea engaged in cultivating these NTFPs, providing insights into their productivity and income levels.

By sharing our knowledge and experiences in this textbook, we aim to contribute to the understanding and sustainable utilization of NTFPs in Korea, fostering the development of forest-based livelihoods and environmental conservation efforts.

Finally, we would like to greatly appreciate to Dr. Chongho Park, Executive Director of the AFOCO and his staff for publishing this book.

Contents

I. Introduction

1. Definition and types of NTFPs 11
2. Importance of NTFPs 12
3. Users and beneficiaries of NTFPs 13
4. Contrasting characteristics of timber and NTFPs 14
5. Unique attributes of NTFPs 14
6. Surging demand for NTFPs 15

II. NTFP Categories and Examples

1. Mushrooms: Shiitake, pine mushroom 18
2. Wild greens: Culinary and nutritional treasures 22
3. Medicinal herbs: Healing from nature's pharmacy 23
4. Fruits in forests: Chestnut, jujube, and beyond 26
5. Sap: Extracting nature's sweetness
(e.g., *Acer pictum* subsp. mono, white birch) 28
6. Forest by-products: Maximizing resource utilization 29

III. NTFP Projects in Korea 30

IV. NTFP Policy in Korea 40

V. Economic Contributions to National Income in Korea 46

VI. Future Prospect of NTFPs in Korea 50

VII. Forest Multiple-Use Management: Case Studies 54



Introduction

Part

1

1. Definition and types of NTFPs

Forest products other than timber that can be obtained in a short period and encompass diverse array of resources, including edible herbs, medicinal herbs, and tree fruits.

Wild greens: These encompass a variety of edible herbs found in forest environments, such as lance asiabell (*Codonopsis lanceolata*), bracken (*Pteridium aquilinum*), aster scaber (*Doellingeria scabra*), and more.

Medicinal herbs: These are comprised of known for their pharmacological effects, including field-cultivated ginseng, perennial herb (*Chrysanthemum zawadzki*), Tian ma (*Gastrodia elata*), and others.

Tree fruits: These consist of edible berries and nuts harvested from trees, including chestnuts, persimmon, pine nuts, and various others.

Types of NTFPs

Out of the 4,957 indigenous plant species in Korea, 79 species (1.6%) are designated as Support itmes of the Forest Producrts as source of income. These items, as defined under subparagraph 7 of Article 2 of the Act on the Creation and Management of Forest Resources, encompass forest products excluding wood (including wood products), soil, and stone and are managed as other forest products (Korea Forest Service, 2024).

According to the Food and Agriculture Organization of the United Nations' (FAO's) working definition, Non-Wood Forest Products (NWFPs) comprise goods of biological origin other than wood, derived from forests, other wooded land, and trees outside forests. These include bamboo, exudates, fruits, tanning, edible insects, insect galls, forest cosmetics, wild edible fungi, maple syrup, palms, wild honey, medicinal herbs, spices, and others (FAO, 2013).

2. Importance of NTFPs

Throughout history, forests have held immense value not only for their timber but also for a myriad of other products. Ancient writings from civilizations such as China, India, and Egypt document the diverse uses for woody plants, with compilations of botanical knowledge from Western Asia highly prized by the ancient Greeks (Wickens, 1990). While timber products have become major international commodities in modern times, NTFPs have a rich history as some of the oldest traded commodities (Iqbal, 1993). For instance, ancient Egyptians imported Arabic gum from Sudan for use in paints, and international trade in sandalwood oil dates back to the twelfth century (FAO, 1995).

Recent experience of forest communities and insights from forestry professionals have underscored the significant importance of NTFPs, including food, fruits, fibers, dyestuffs, flavors, and medicines, in meeting people's needs. A growing body of scientific research suggests that NTFPs can fulfill community needs while preserving forest resources. Notably, in Latin America, "extractive reserves" designates areas where forests are conserved for low-impact use by traditional communities (FAO, 1995).

Despite their importance, why have modern science and governments historically overlooked NTFPs? Firstly, many of these products are primarily used for rural subsistence or local markets, often escaping official statistics focusing on nationally traded goods (Chandrasekharan, 1994). Secondly, modern government organizations' delineation of these products among forestry, agriculture, and horticulture has led to a lack of recognition of even nationally and internationally significant non-timber forest commodities originating from forests. This division between forestry and agriculture has created a blind spot in understanding our dependence on forests. Thirdly, modern forestry has traditionally prioritized timber and large-scale enterprises, often treating non-timber products as secondary (FAO, 1995).

However, research has shown that forests produce vast products beyond timber, particularly tropical forests (Toledo *et al.*, 1992). For example, small-scale forest-based enterprises in Zimbabwe, primarily focused on NTFPs, employed significantly more people (237,000) compared to conventional forestry and forest industries (16,000) in 1991 (Arnold *et al.*, 1994).

3. Users and beneficiaries of NTFPs

NTFPs provide essential food, nutrition, medicine, fodder, fuel, roofing and construction materials, mulch, and non-farm income. Particularly significant are their contributions to alleviating "hunger periods" in the agricultural cycle and smoothing out seasonal fluctuations for rural households worldwide. NTFPs offer employment opportunities during agricultural downtimes and serve as a buffer against household emergencies and risks (FAO, 1995).

For many impoverished households, NTFPs are lifelines, as they often have greater access to the forest than other resources. Consequently, women, who bear the brunt of household responsibilities in forest activities such as food gathering, medicine collection, and fuelwood procurement, rely heavily on NTFPs for sustenance and income. In numerous developing nations, women's roles in utilizing forest-based resources make NTFPs vital for ensuring food security and nutritional well-being (FAO, 1995).

Moreover, NTFPs significantly contribute to national economic growth, particularly through the medicinal sector. They cater to the needs of various groups, including rural populations (the largest demographic), urban consumers (a smaller but rapidly expanding group), and traders and processors in the NTFP sectors, whose numbers increase with the growth of urban markets for these products (FAO, 1995).

4. Contrasting characteristics of timber and NTFPs

In contrast to timber products, NTFPs offer distinct characteristics. Timber products typically require significant capital investment and involve long-term commitments due to the extended tree growth periods. Consequently, timber production demands high costs, including expenses for land management, tree growing, and harvesting equipment. However, despite the substantial investment, profitability from timber production tends to be low due to the combination of high production costs and relatively low sales prices, particularly during the rotation period. This stark contrast highlights the differing financial dynamics between the timber and NTFPs in forest economies.

5. Unique attributes of NTFPs

NTFPs offer unique attributes that distinguish them from timber products. NTFPs can regenerate regular income within relatively short periods. This characteristic is particularly valuable for forest economies seeking shorter investment cycles and quicker returns. Due to their shorter growth periods, NTFPs generally incur lower production costs than timber, making them economically viable for many producers. Additionally, the profitability of NTFPs is often higher, thanks to their lower production costs and potentially high market value. These distinctive attributes make NTFPs an attractive option for forest management and contribute to their growing importance in sustainable forest economies.

6. Surging demand for NTFPs

The demand for NTFPs in Korea has surged due to evolving social conditions and changing consumer preferences. Forest owners are increasingly seeking ways to generate stable incomes in a shorter timeframe. Moreover, there is a growing emphasis on well-being and lifestyles centered around health and sustainability.

Several factors drive this shift in demand:

- 1) Need for short-term income: There is a heightened demand for forest products that can yield stable incomes within a short period, addressing the need to overcome economic uncertainties associated with long-term investments.
- 2) Rise of well-being and LOHAS: Social issues related to well-being and LOHAS (Lifestyle Of Health And Sustainability) are gaining prominence, emphasizing products that promote health and sustainability.
- 3) Demand for clean forest products: Consumers are increasingly seeking clean forest products, including healthy foods and medicinal raw materials. The markets for organic foods, clean forest products, ornamental plants, and others are expanding rapidly, with significant contributions from forest mushrooms (KRW 240 billion), ornamental plants (KRW 409 billion), wild greens (KRW 392 billion), and tree fruits (KRW 629 billion) in 2022.
- 4) Back-to-the-farm trends: The increase in retirements among baby boomers has led to a resurgence in back-to-the-farm movements, further driving the demand for NTFPs.

In 2022, the production value of NTFPs in Korea reached KRW 2.36 trillion, indicating their growing importance within the total forest products production value of KRW 77.5 trillion (Korea Forest Service, 2023). These trends underscore the significant role that NTFPs play in meeting consumer demands and contributing to the economic vitality of forest-dependent communities.

*KRW= Korean Won, \$1.00 equivalent to 1,350 Korean won



NTFP Categories and Examples

Part

2

1. Principal uses of NTFPs in the world

Principal uses of NTFPs are diverse and encompass various sectors, as outlined by FAO (2009): Bamboo, rattan, beekeeping, cashew, rubber, tasmanian blue gum, oil palm, wattle (*Acacia*), quinine, annato (*Bixa orellana*), pepper, cardamom, nutmeg (*Myristica*), sapota (*Manikara*), ginseng, among others (EC-FAO Partnership Programme, 2002; FAO, 2002).

- 1) Foodstuffs: Including bush meat, honey, edible fruits and nuts, leaves, shoots, tubers, whole plants, fungi (mushrooms), and even edible insects.
- 2) Medicines: Utilizing plants like the Pacific yew tree (*Taxus brevifolia*) and *Ginkgo biloba* for their medicinal properties.
- 3) Fibers: Extracting fibers from plants like Pita (*Aechmea magdalenae*) in Mexico.
- 4) Fatty oils: Obtaining oils from sources such as the African oil palm, Kusum (*Schleichera oleosa*), babassu (*Attalea speciosa*), crabwood (*Carapa* spp.), neem (*Azadirachta indica*), shea nut (Karite).
- 5) Essential oils: Extracting aroma compounds like rosewood (*Dalbergia* spp.).
- 6) Edible oils: Including palm oil, is widely used in cooking and food preparation.
- 7) Resins: Utilizing a variety of tree species for their resin, such as *Agathis*, sal dammar in India, pine resin, balsams, benzoin (*Styrax*), and Liquidambar balsam.
- 8) Waxes: Derived from sources like wax palm, carnauba wax, candelilla wax from candelilla (*Euphorbia antisyphilitica*), Jojoba wax, and Myrtle wax.
- 9) Gums: Tapped from gum-producing species like gum arabic (*Acacia senegal*), tropical chestnuts (*Sterculia* spp.), and *Prosopis*.
- 10) Latexes: Extracted from rubber tree (*Hevea brasiliensis*), jelutong, and chicle (chewing gum).
- 11) Natural dyes and colors: Obtained from tree bark, leaves, and wood, including Akam-asante or Yaruba, Magnolia, and indigo dye.
- 12) Food colors: derived from substances like Bixin from the Annato tree and Lac (edible dye).
- 13) Tannins: Used in tanning and leather production.
- 14) Sweetening agents: Such as those found in certain NTFPs.
- 15) Others: Additional uses include cork, furniture, mats, flooring, roofing, decorative items, swallow nests and more.

2. Examples of NTFPs produced in Korea

1) Mushrooms (8)

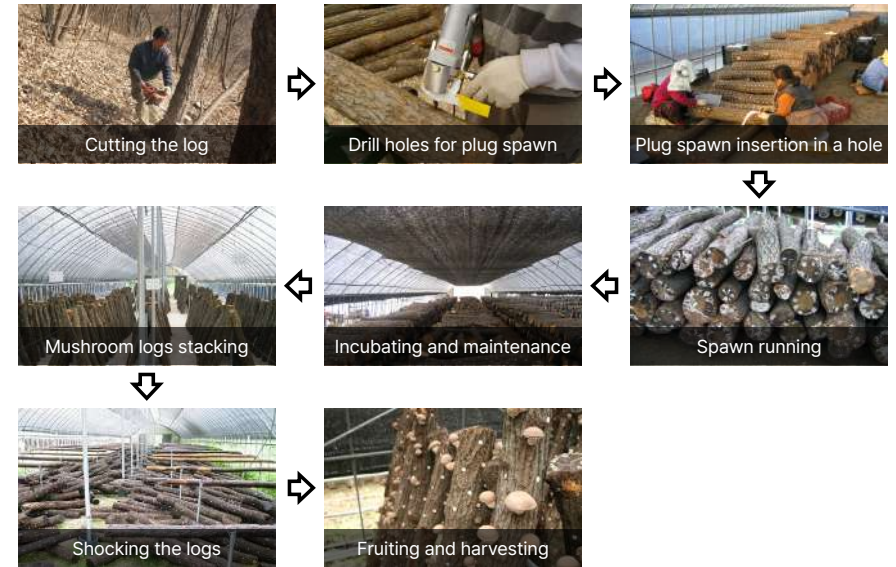
shiitake (*Lentinula edodes*), pine mushroom (*Tricholoma magnivelare*), imbricated hydnum, wood ear (*Auricularia heimuer*), clustered coral (*Clavaria botrytis*), among others.

(1) Shiitake (oak) mushroom

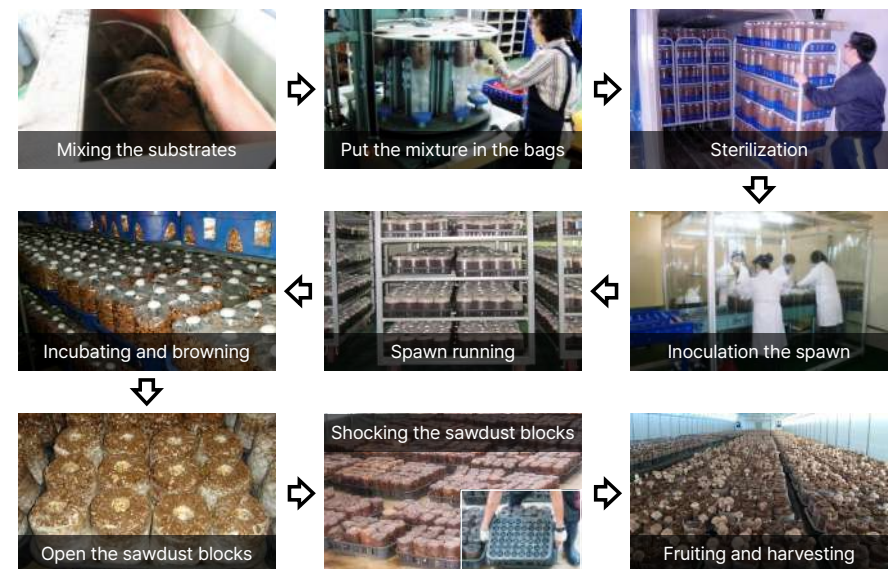
Shiitake mushrooms are a key focus of this book due to their significance. In 2022, production amounted to 17,837 tons (KRW 193,476 million). The production figures of NTFPs in 2022 were reduced, compared to those in 2015. It was due to Covid-19 pandemic. Cultivation methods differ, with mushrooms grown on logs for 5 years and on sawdust for six months, as 2,707 households using logs and 1,805 households utilizing sawdust. Notable production regions in 2022 include Buyeo (1,492 tons), Yeosu (1,282 tons) and Jangheung (681 tons) for fresh shiitake, and Jangheung (198 tons), Geoje (34 tons) and Cheonan (27 tons) for dried shiitake.

Government support for shiitake cultivation is substantial. Projects with total costs below KRW 100 million receive 20% subsidy from the national budget, 30% from the local budget, 30% as a loan, and 20% self-financing. For projects exceeding KRW 100 million, the subsidy includes 40% from the national budget, 20% from the local budget, and 40% self-financing. Support facilities encompass cultivation infrastructure, substrate production, heating and cooling systems, and procurement of logs and sawdust.

Process for shiitake cultivation using logs



Process for shiitake cultivation using sawdust



Success story of shiitake cultivation: CHUNG Chang Sik (Representative of Boryeong Mushroom Cooperatives, Chungnam-do)

In 2005, the Boryeong Mushrooms Cooperatives were established with just 10 members. Today, they have grown to encompass 60 members and employ 20 staffs. Their impact extends beyond the cooperative as they provide eco-friendly school meals to 2,500 schools through partnerships with entities like Costco, Consumer Cooperatives, and Post Office. Their distribution network spans 6 metropolitan cities, facilitating a daily shipment of approximately 50–60 boxes. Remarkably, each member enjoys a profit of about KRW 40 million.

The success of Boryeong Mushroom Cooperatives can be attributed to their commitment to eco-friendly mushroom production and product diversification.

(2) Pine mushroom

The production volume of pine mushrooms reached 124 tons (valued at KRW 19.2 billion) in 2016, growing to 129 tons (KRW 27.9 billion) by 2022. Despite challenges in artificial cultivation, a breakthrough was achieved when the pine mushrooms emerged 16 years after infected seedlings were transplanted into an area affected by a forest fire, as confirmed by the National Institute of Forest Science in Korea. Successful cultivation of pine mushrooms relies on suitable environmental conditions, including pine trees, spores, and soil quality. Pine mushrooms form in the ectomycorrhiza of pine tree roots, emphasizing the importance of specific ecological factors.

Gyeongbuk-do and Gangwon-do are major production regions, accounting for 82 tons and 24 tons, respectively. However, production levels are susceptible to climatic variations such as temperature and precipitation, leading to fluctuations in output.

Government support and subsidies to produce pine mushrooms in Korea are as follows:

- a) Management activities for optimal growth environment: In forests where pine mushrooms naturally occur or are targeted for production, various management activities are essential to create an optimal growth environment. These activities include thinning, pruning, clearing understory vegetation, removing ground cover, and installing irrigation systems. Foresters aiming to undertake such activities can benefit from government subsidy programs.
- b) Subsidy program coverage: This subsidy program covers up to 50% of the total project cost, drawing from national and local budgets. Foresters interested in this support can apply for the project funded by local governments in the preceding year. After a comprehensive review of the project's feasibility and other relevant factors, foresters can expect to receive support the following year.

To foster the optimal growth of pine mushrooms in forests, various projects receive government support:

- (a) Vegetation control: This involves thinning, pruning, understory vegetation control, and removing broadleaved trees other than pine trees. These efforts are geared towards ensuring healthy pine mushroom growth by managing and caring for the surrounding vegetation.
 - (b) Fairy ring management: Specific management practices are implemented to facilitate the growth of fairy rings, indicative of *Tricholoma matsutake* mushroom growth. These include removing factors that impede fairy ring development and clearing organic matter such as leaves and vegetation roots near mushroom growing sites.
- b) Budget support: Facilities involved in these projects can receive budgetary support of up to KRW 50 million per facility upon successful grant application and review selection. The support allocated varies based on factors such as pine tree age and pine mushroom yield. Requests for support budgets can be made through local governments in the preceding year, with the allocated budget disbursed in the subsequent year.

Success story of pine mushroom cultivation

In Uljin, the Forest Cooperatives have pioneered a groundbreaking business model that intertwines the cultivation of pine mushrooms with the preservation of Geumgang pine trees. Their innovative approach has led to the establishment of the 6th Business Model, garnering widespread acclaim. Each October, the region hosts 14 local pine mushroom festivals, with Uljin's festival emerging as a landmark event. During the festivities, a staggering 170,000 visitors flock to the region over the course of the three-day festival.

To enhance transparency in the selection and bidding process, a real-time service system was introduced in 2013, providing crucial information on the bidding prices. This initiative aimed to facilitate fairer transactions and foster greater trust among stakeholders. Furthermore, direct marketing connections with supermarkets were established, reducing retail margins and boosting cooperative members' income.

2) Wild greens/edible herbs (12)

A diverse array of wild greens and edible herbs, including lance asiabell (*Codonopsis lanceolata*), bracken (*Pteridium aquilinum*), balloon flower (*Platycodon grandiflorum*), herb (*Aster scaber*), Japanese angelica tree (*Aralia elata*), tawny daylily (*Hemerocallis fulva*), arrow bamboo (*Pseudosasa japonica*), victory onion (*Allium victorialis*), Korean thistle (*Cirsium setidens*), asian royal fern (*Osmunda japonica*), Manchurian ash sprout (*Fraxinus mandschurica*), *Actinidia arguta* sprout, and more, are cultivated in various regions.

The production volumes of cultivated wild greens (edible herbs) reached 43,213 tons in 2015, generating KRW 383.2 billion and 37,470 tons in 2022, with revenue amounting to KRW 395.2 billion.

This increase in cultivation is attributed to the growing demand for natural foods, driven by rising national income levels.

Major products such as balloon flower root, wild aster, and deodeok (in production volume) are cultivated alongside other crops under forest multiple-use management. Gangwon-do (10,076 tons), Jeonnam-do (7,670 tons), and Gyeongnam-do (7,024 tons) emerged as major regions for wild green cultivation in 2022.

3) Medicinal herbs (18)

A variety of medicinal herbs, including goat weed (*Epimedium koreanum*), *Atractylodes ovata*, east-asian wormwood (*Artemisia dubia*), Bupleurum root (*Bupleuri Radix*), peony root (*Paeonia lactiflora*), perennial herb (*Gastrodia elata*), wild-simulated ginseng, sickle senna (*Cassia tora*), short perennial herb (*Chrysanthemum zawadskii*), fish leaf (*Houttuynia cordata*), Korean angelica (*Angelica gigas*), *Cnidium officinale* and more are cultivated across different regions.

The production volumes of cultivated medicinal herbs were 33,191 tons in 2016, generating revenue of KRW 538.8 billion and 24,703 tons in 2022, with revenue reaching KRW 591.7 billion.

Local governments have shown increased interest in revitalizing local livelihoods by cultivating medicinal herbs. This led to the organization of various expos and the establishment of forest-bio centers. Thus, Medicinal Herb Expo was held in Sancheong, Gyeongnam-do. The Wild-simulated ginseng Expo was held in Hamyang, Gyeongnam-do. The first forest-bio-center opened in Okcheon, Chungbuk-do, in 2024. In addition, forest-bio-centers are being established in three regions (Naju, Jinju, and Chuncheon) with KRW 20 billion per center and KRW 13 billion supported by the Korea Forest Service.

Major regions for medicinal herb cultivation include Gyeongbuk-do (12,887 tons), Gyeongnam-do (2,758 tons), Gangwon-do (2,464 tons), Jeonbuk-do (2,073 tons), and Chungnam-do (1,710 tons), among others, in 2022.

Government support and subsidies for cultivating wild green and medicinal herbs were as follows:

Project title: Support for the scale-up of forest production zones

a) Competitive project

This initiative offers a competitive platform for projects with a total cost of up to KRW 700 million, enabling phased implementations over 1~2 years. Support encompasses various aspects, including design and supervision costs, infrastructure development (greenhouses, work roads, warehouse, monorails, among others), labor expenses for planting activities, and procurement of seeds and seedlings.

b) Small project

A tailored support structure is in place for projects with a total cost of KRW 100 million. This includes 20% government funding, complemented by 30% local funds, 30% from loans, and 20% from self-financing. Support is directed towards acquiring production equipment such as excavators, forest mushroom disaster prevention facilities, work road repairs, and management of old chestnut trees, among other essentials.

Success story for wild green and medicinal herbs: Poosae (푸새) and G: HWANG J.S. from Jeongsun, Gangwon-do, who embarked on a remarkable journey a decade ago.

Poosae & G boldly decided to relocate to a tranquil mountain village ten years ago. Renting 10 hectares of national forest land, they laid the foundation for their ambitious venture into cultivating wild ginseng and other indigenous herbs. Through persistent efforts and annual expansions, Poosae & G achieved remarkable success. Their diverse portfolio includes cultivation areas for various herbs, with six hectares dedicated to wild ginseng, alongside plantations for gondre (*Cirsium setidens*), gomchui (*Ligularia fischeri*), and wild garlic (*Allium victorialis*). Their annual sales skyrocketed, reaching an impressive KRW of 450 million, with a net profit of KRW 80 million. Poosae & G's entrepreneurial spirit extends beyond cultivation. In November 2011, they filed a patent application for fermented wild ginseng under the brand name '山蔘어람' (Sansam Eoram). This groundbreaking product has paved the way for export opportunities, with plans to venture into lucrative markets such as China, Japan, and beyond.

Poosae & G's remarkable journey exemplifies the transformative potential of sustainable agriculture and herbal entrepreneurship. Their commitment to innovation, quality, and environmental stewardship inspires aspiring herbalists and cultivators worldwide.

- Wild-simulated ginseng cultivation

Wild-simulated ginseng represents a harmonious blend of traditional cultivation practices and modern consumer demands. Wild-simulated ginseng thrives in forest environments, either sown directly or transplanted from nursery-grown seedlings.

Cultivated without pesticides, it mirrors the conditions of its natural habitat, closely resembling wild ginseng. Embracing the Araliaceae family, it shares the scientific name *Panax ginseng* C.A. Meyer with Korean ginseng. Under the "Forestry and Mountain Villages Development Promotion Act," Korean authorities recognize plants of the Araliaceae family that meet stringent quality standards as wild-simulated ginseng. Since 2011, the Korea Forest Service has designated it as a "specially managed forest product," ensuring consumer protection and enhancing product quality. Driven by increasing consumer interest in clean forest products, the demand for wild-simulated ginseng continues to surge. Production volumes have steadily risen, with 185 tons cultivated across 11,819 hectares by 3,182 dedicated foresters in 2021. The production value experienced consistent growth, reaching KRW 54.2 billion in 2021 from KRW 37.9 billion in 2017 (KRW 3.3 billion yearly). Consumers predominantly purchase wild-simulated ginseng from local festival sales booths, accounting for 54.4% of sales. Department stores, supermarkets (10.6%), and traditional markets (10.0%) also serve as key distribution channels, collectively contributing to consumer accessibility. Consumers' preferred type of wild-simulated ginseng is 7 to 10 years old. To uphold product integrity, cultivators undergo rigorous production suitability investigations and quality inspections every three years. Managed by the Korea Forest Service, these activities ensure product safety and alleviate the financial burden on producers, with the service supporting fees (KRW 380,000 per case).

4) Fruits in forests (14)

Korea boasts various tree fruits, each contributing to the country's vibrant culinary tapestry. These include chestnut, persimmon, pine nut, walnut, jujube, ginkgo nut, acorn, hazelnut, Crimson Glory Vine, Bower *Actinidia*, and *Rubus coreanus* (mountain berry).

Chestnut

Renowned for its rich flavor and versatility, the chestnut is a beloved autumn treat in Korea. Whether roasted, boiled, or incorporated into dishes, its nutty sweetness delights palates across the nation.

Persimmon

Symbolizing autumn's bounty, persimmons grace Korean landscapes with their vibrant hues. Whether enjoyed fresh, dried, or transformed into traditional delicacies like persimmon punch (sujeonggwa), these fruits offer a delightful blend of sweetness and tanginess.

Pine nut

Treasured for their delicate flavor and nutritional benefits, pine nuts are a culinary staple in Korean cuisine. Whether sprinkled over salads, incorporated into savory dishes, or used to garnish desserts, their subtle nuttiness adds depth to a wide range of dishes.

Walnut

Walnuts are prized for their rich, buttery flavor and crunchy texture. Whether enjoyed as a nutritious snack or incorporated into baked goods and confections, these versatile nuts are cherished for their robust taste and health benefits.

Jujube

Jujubes, known as Korean dates, are revered for their sweet, honey-like flavor and chewy texture. Whether consumed fresh, dried, or incorporated into teas and desserts, these fruits are valued for their natural sweetness and potential health benefits.

Ginkgo nut

Ginkgo nuts, with their distinctive flavor and aroma, are a unique addition to Korean cuisine. Whether steamed, roasted, or stir-fried, these nutritious nuts lend a distinctive flavor and texture to various dishes.

Acorn

Acorns, a traditional Korean ingredient, are cherished for their earthy flavor and versatility. Whether ground into flour for making noodles and pancakes or incorporated into savory dishes, acorns add a distinctive taste to Korean cuisine.

Hazelnut

Hazelnuts are prized for their rich, buttery flavor and crunchy texture. Whether enjoyed on their own as a snack or used to enhance the flavor of baked goods and desserts, these nuts are a cherished ingredient in Korean culinary traditions.

Crimson Glory Vine

Crimson Glory vine, or bittersweet, is valued for its tart flavor and vibrant color. Whether used in preserves, sauces, or beverages, its unique taste adds depth to a variety of culinary creations.

Bower Actinidia

Bower Actinidia, or hardy kiwi, offers a refreshing flavor with its sweet and tangy taste. Whether eaten fresh or used to enhance the flavor of desserts and beverages, these small fruits are a delightful addition to Korean cuisine.

***Rubus coreanus* (Mountain Berry)**

Rubus coreanus, also known as Korean black raspberry, is prized for its intense flavor and antioxidant properties. Whether eaten fresh, dried or used to flavor teas and beverages, these berries offer a deliciously tart and slightly sweet taste.

These tree fruits not only tantalize the taste buds but also reflect Korea's rich agricultural heritage and culinary creativity. Each fruit adds unique flavor and nutritional benefits to Korean cuisine, enriching the country's culinary landscape from chestnuts to jujubes.

5) Sap (*Acer pictum* subsp. mono, white birch)

Sap, particularly from species like Korean maple (*Acer pictum* subsp. mono) and white birch (*Betula costata*), holds significant cultural and culinary value in Korea. In early spring, Korean maple trees are tapped to collect sap, then boiled down to make various sweet treats and beverages. Similarly, white birch trees are tapped for their sap, prized for its refreshing taste and health benefits.

Sap from Korean maple and white birch trees is often consumed as a refreshing beverage, either on its own or mixed with other ingredients to create unique flavors. The sap is boiled to create syrups used as sweeteners in various dishes and desserts. The sap is sometimes fermented to create alcoholic beverages, adding a distinct flavor to traditional drinks.

Sap tapping is often associated with traditional festivals in Korea, where communities come together to celebrate the arrival of spring and the bounty of nature. Sap from Korean maple and white birch trees is believed to have various health benefits, including detoxification, hydration, and immune system support.

Traditional sap-tapping practices emphasize sustainability and respect for the environment, ensuring trees are not harmed during the collection process. As awareness of environmental conservation grows, efforts are being made to protect maple and birch trees and preserve their habitats for future generations.

Sap tapping provides economic opportunities for local communities, including small-scale producers who sell sap-based products at markets and festivals. Sap tapping activities and festivals attract tourists interested in experiencing traditional Korean culture and cuisine, contributing to local economies.

6) Forest by-products

Forest by-products, including leaves, bark, resin, tree roots, and tree sprouts, play essential roles in various industries and traditional practices in Korea.

Fallen leaves are often collected and used as mulch or added to compost piles to enrich soil fertility in agricultural practices. Certain leaves have medicinal properties and are used in traditional Korean medicine to make herbal remedies. Bark from certain tree species contains tannins used in leather tanning processes and dyeing fabrics. Bark strips may be used in traditional crafts such as basket weaving or as decorative elements in artisanal products.

The resin extracted from trees like pine is used to make adhesives, sealants, and varnishes in industries ranging from construction to woodworking. Resin has traditional uses in incense-making and as a natural preservative for wood and other materials.

Certain tree roots are used in traditional Korean medicine for their purported health benefits. Tree roots help stabilize soil and prevent erosion, making them valuable for slope stabilization projects.

Sprouts from trees like oak or maple can be collected and propagated to establish new trees, aiding in reforestation and landscaping projects.

Sasa borealis, also known as Korean bamboo grass, has edible shoots used in Korean cuisine, particularly in traditional dishes like Juk. In addition to its culinary uses, *Sasa borealis* is valued as an ornamental plant in gardens and landscapes for its graceful foliage and ability to form dense, attractive stands. The sturdy, flexible stems of *Sasa borealis* can be used in traditional crafts such as basketry, weaving, and thatching.



NTFP Projects in Korea

Part

3

1. Legal framework for NTFP support

The institutional support for NTFPs in Korea is grounded in the “FORESTRY AND MOUNTAIN VILLAGES DEVELOPMENT PROMOTION ACT,” specifically Article 8, Paragraph 1. This legislation outlines provisions for developing and promoting various income sources related to forest products, identifying 79 species for support.

2. Support for production costs

1) Forest multiple-use management support. Government assistance encompasses a range of activities such as thinning, natural forest tending, and establishing irrigation facilities, protection fences, forest roads, monitoring facilities, monorails, maintenance of houses, and others. Financial support is provided for projects aimed to grow forest tending project sites.

a) Competitive project (government funds 40%, local funds 20%, self-financing 40%). With a project cost of up to KRW 700 million, this competitive initiative is divided into 1~2-year phased projects, with funding sourced from government, local, and self-financing.

b) Small projects within KRW 100 million are eligible government funds covering 20%, supplemented by local funds (30%), loans (30%), and self-financing (20%).

2) Production cost support of forest products (government funds 20%, local funds 30%, loans 30%, self-financing 20%). Assistance is available for various activities, including forest road construction, mature tree management, production and pest control equipment procurement, alternative forest product development, and soil improvement. Support conditions vary by forest product category and area. For instance, forest mushroom cultivation requires facilities of a certain size (1,650 m²) and open-field cultivation (3,300 m²), while ornamental forest plants have different eligibility criteria (cultivation in open fields of 10,000 m² and facilities of 1,000 m² or more). For other forest product categories, the standard is set at 25,000 m² or more.

3) Support for distribution of forest products. This initiative covers the selection, storage, processing, distribution, and development of brands for forest products. Key activities include the establishment of comprehensive distribution centers at the product origin (government funds 50%, local funds 20%, self-financing 30%), activation of the processing industry (government funds 50%, local funds 20%, self-financing 30%), development of distribution infrastructure (government funds 20%, local funds 30%, loans 30%, self-financing 20%), and support for product commercialization (government funds 20%, local funds 30%, loans 30%, self-financing 20%).

4) Support for package design development of registered forest products (61 items) Support is extended to enhance the packaging design or materials of forest products registered with a geographical indication (GI) or eco-friendly certification. This initiative aims to elevate product competitiveness and cultivate premium branding to add significant value. Foresters are eligible for support with a total project cost of up to KRW 50 million, including a national fund contribution of KRW 10 million. The funding structure comprises government funds (20%), local funds (30%), loans (30%), and self-financing (20%).

Sixty registered forest products with geographical indication include:

Yangyang pine mushrooms, Jangheung shiitake, Sancheong dried persimmons, Jeong-an chestnuts, Ulleungdo goat's beard, Ulleungdo *Solidago virga-aurea*, Ulleungdo *Osmunda japonica*, Ulleungdo *Erysimum cheiranthoides*, Gyeong-san jujube, Bonghwa pine mushrooms, Cheongyang Chinese matrimony vine, Sangju dried persimmons, Changsun bracken, Youngduk pine mushrooms, Gurye Japanese cornelian cherry, Gwangyang Baegunsan maple sap, Younam *Diospyros kaki*, Cheonan walnuts, Mungyeong Korean schisandra, Muju crimson glory vine, Uljin pine mushrooms, Hoengseong *Codonopsis lanceolata*, Youngdong dried persimmons, Gapyeong pine nuts, Hongcheon pine nuts, Boeun jujube, Cheongdo persimmons, Jeongseon setidens, Geoje *Phyllostachys pubescens*, Taeback groudssel, Deogusan maple sap, Jindo Chinese matrimony vine, Damyang bamboo shoots, Muju wine, Chungju chestnuts, Hamyang dried persimmons, Ulleungdo maple sap, Gangneung *Aralia elata*, Hwasun peony root, Hwasun *Paeonia suffruticosa*, Wonju lacquer sap, Muju Gastrodiae radix, Hongcheon myeongyi, Cheongyang shiitake, Cheongyang chestnuts, Muju walnut, Inje maple sap, Yeongwol gondre, Jangsu omija, Buyeo shiitake, Muju Korean schisandra,

Pyeongchang wild-cultivated ginseng, Miryang jujube, Inje Korean schisandra, Hamyang wild-cultivated ginseng, Gimcheon walnut, Jeju bracken, and Haenam Korean dendropanax, Cheongdo dried persimmons, Jeju shiitake.

This comprehensive list encompasses a diverse range of forest products, each eligible for support to refine their packaging to meet modern market standards and consumer preferences.

3. Support for the export of forest products

In 2022, forest product exports surged to USD 480 million, a 7.2% increase from the previous year. Short-term income forests contributed significantly, representing 19.3% of total exports, equivalent to USD 93 million. To bolster this trend, the Korea Forest Service (KFS) has embarked on a multifaceted approach to expand export channels and enhance global awareness. The KFS has spearheaded various initiatives, including participation in fairs (7 times), online mall sales (10 companies), overseas promotional events (21 times), online content creation (15 cases), and innovative new media marketing strategies (6 cases) in 2023. These efforts seek to diversify export avenues and elevate the profile of Korean forest products on the global stage (KFS, 2023).

Specifically, export-oriented facilities have been expanded to establish dedicated export regions, fostering specialized export management companies. Consistent support has been provided to leading export organizations, from production to export. Moreover, the export council has been revamped and structured to facilitate joint marketing efforts among exporters, categorized by production type.

Over the past decade, the project to enhance forest product export infrastructure has seen substantial investment in joint facilities and equipment across 10 key regions, including Buyeo, Cheongyang, Cheongdo, Hadong, and Okcheon. These areas, renowned for their forest product output, are being developed into regional export hubs, boasting stringent quality standards and safety protocols.

Further emphasis has been placed on nurturing leading export organizations, enhancing their quality standards, and fortifying export capabilities. This includes expanding farm participation and fostering closer collaboration between producers and exporters. Additionally, the autonomous functions of the export council have been reinforced, focusing on establishing item-specific quality benchmarks, facilitating information exchange, and organizing specialized training workshops for companies to boost their export prowess.

To maintain the freshness and quality of export products, support is extended for essential processing equipment such as vacuum coolers, metal detectors, and automatic packaging machinery. Export logistics costs are subsidized, with joint logistics centers established in key importing countries like the United States and Japan. Refrigeration and freezer facilities are endorsed for items requiring cold chains, such as chestnuts and persimmons.

Comprehensive assistance is provided throughout the export process, encompassing production history management of export forest products, overseas certification acquisition, food hygiene inspection, and export insurance coverage to manage risks. These measures collectively contribute to the sustained growth and competitiveness of Korean forest product exports globally.

4. Support for disaster insurance

In response to the escalating frequency and severity of natural disasters like abnormal temperatures and concentrated heavy rainfall, the Korean government has taken proactive measures to empower farmers in managing operational risks. One such initiative is the Crop Disaster Insurance system, introduced in 2001. This program has evolved over the years, expanding its coverage to include a broader array of eligible crops and enhanced protection mechanisms. The primary objective of Crop Disaster Insurance is to mitigate the financial impact of crop losses caused by natural disasters, thereby promoting stability in farmers' income and agricultural operations.

As of 2022, the Crop Disaster Insurance program encompasses 67 crop varieties, spanning a range of agricultural products such as apples, pears, persimmons, and chestnuts. Notably, short-term income forestry products were integrated into the framework in 2006, initially with persimmons as a pilot item under the "Agriculture and Fisheries Disaster Insurance Act." Over time, the program has expanded to encompass seven forestry items, including chestnuts, jujubes, black raspberries, shiitake mushrooms, Korean schisandra omija, and walnuts. Additionally, in 2024, insurance coverage for wild aster (Dureup, Korean angelica-tree) is undergoing pilot testing.

The government offers substantial subsidies for insurance premiums to alleviate the economic burden on farmers. Specifically, the government subsidizes 50% of the insurance premium, with local governments providing an additional subsidy of approximately 30% based on individual circumstances. These subsidies are accessible to individual farms and agricultural corporations enrolled in the insurance program, aiming to facilitate broader participation and uptake among farming communities.

5. Support for forestry taxes

The taxation framework pertaining to forestry in Korea encompasses both national and local tax categories, each serving distinct purposes within the forestry sector. National taxes include income, inheritance, gift, value-added, and comprehensive real estate taxes, while local taxes include acquisition, registration, and property taxes.

1) National Taxes

(1) Income Tax

Income derived from harvesting or transferring trees in forest older than five years is exempt from taxation up to KRW 6 million annually (Income Tax Act, Article 12). Forest residents approved for a forest management plan and over ten years of forest stewardship can receive a transfer income tax reduction ranging from 10% to 50%, based on the management period (Special Tax Treatment Control Law, Articles 69, 133, and 69-4).

(2) Inheritance Tax

The property value of forests with newly planted trees following a forest management plan for over five years is deductible up to KRW 2 billion (Inheritance and Gift Tax Act, Article 18). Deduction eligibility requires direct forest management by the decedent for two years prior to the inheritance, residing within the local government or a 30 km radius of the forest.

(3) Gift Tax

Forests with new plantations, according to a forest management plan for over five years, up to 29.7 ha, are exempt from gift tax when transferred to direct descendants (Special Tax Treatment Control Law, Articles 71 and 133). Forests aged over 20 years are gift tax-exempt up to 99 ha, with location restrictions applying (outside residential, commercial, and industrial areas, land development districts, and development project zones). The exemption amount for the gift tax can total up to KRW 100 million over five years.

(4) Value-Added Tax

Wood pellets are value-added tax (VAT)-exempt from value-added tax under the Special Tax Treatment Control Law, Article 106. Fertilizers, pesticides, forestry materials, and eco-friendly agricultural production materials incur a zero VAT rate (Law, Article 105). VAT exemption applies to petroleum products used in forestry by forestry workers (Law, Article 106-2). VAT refund is available for some forestry materials (Law, Article 105-2).

(5) Comprehensive Real Estate Tax

Preserved forests under the approved forest management plan are included but not separately taxed under the Local Tax Law (Comprehensive Real Estate Tax Law, Article 11).

2) Local Taxes

(1) Acquisition Tax

The acquisition tax exemption applies to forests exchanged or subdivided for direct forestry purposes by a model manager or successors (Local Tax Special Case Limitation Law, Articles 6 and 8). Up to 99 ha of preserved forest acquired by a model manager of forests or successors qualifies for a 50% reduction in acquisition tax. Returning farmers who move to rural areas and acquire forests for direct cultivation are given a 50% reduction in acquisition tax, provided they create farmland within three years.

(2) Property Tax

Separate taxation applies to semi-preserved mountainous districts under forest management with approved forest management plans (Local Tax Law, Articles 106 and 109). Tax exemptions are granted for forests in specialized areas, including forest protection zones, forests for seed collection, experimental forests, nature conservation districts in a park, and Baekdu-daegan protection areas.

The taxation system is designed to incentivize sustainable forest management while supporting the livelihoods of forest stakeholders and conserving forest resources.

6. Loan support through forestry policy funds

The Comprehensive Funding for Forestry Projects aims to invigorate forestry initiatives and bolster the economy by extending long-term, low-interest policy loans to foresters and producer organizations who wish to undertake forestry projects. This endeavor is geared towards augmenting forest household income and fostering economic vitality within the forestry sector.

A diverse array of 12 supported projects is available, each tailored to specific needs within the forestry domain. These projects encompass various facets of forestry development and are accompanied by corresponding loan scales. The supported projects and their loan allocations include the following: the creation of a forestry management foundation through forest tending and forest road facilities (KRW 489 million), the establishment of a professional forester infrastructure (KRW 78,800 million), the creation of forest recreation facilities (KRW 500 million), production of wild-simulated ginseng (KRW 1,500 million), development of overseas forest resources (KRW 4,700 million), entrepreneurship and home purchasing for returning to rural areas (KRW 18,000 million), support for short-term forest income (KRW 10,122 million), production of seedlings for forestation (KRW 314 million), activation of wood utilization (KRW 4,546 million), support for forestry corporations (KRW 756 million), operational funds for foresters (KRW 1,716 million), and emergency support for disaster recovery for foresters.

In total, the loan scale for 2024 is KRW 121.4 billion. Interest rates vary from 1% to 3%, while loan periods range between 2 and 35 years. Interested parties can submit their applications through local forestry cooperatives, gaining access to vital financial assistance to propel their forestry projects forward.



NTFP Policy in Korea

Part

4

1. Policy direction for forest income

- 1) Vision: Enhance the income of forest workers through securing the sustainability of forestry
- 2) The goal of the 6th National Forest Plan: To improve the ratio of forest household income to the national median income to 105%

2. Key Policies

- 1) Support for stable forest management
- 2) Cultivation of young foresters and forestry technicians
- 3) Innovation in production and distribution structures for short-term income forestry products
- 4) Enhancement of global competitiveness of Korean forest products

3. Details of the Main Policies (Figure 1)

1) Support for Stable Forest Management

The KFS is committed to fostering stable forest management through comprehensive initiatives to enhance equity with other industries like agriculture. To stimulate investment in forestry and ensure the well-being of forest households, several measures are being implemented and expanded. Introduced in 2022, the Forestry Direct Payment System has already benefited 21,000 forest households with a total disbursement of KRW 46.9 billion, resulting in a significant income improvement effect of 5.9% per household. Eligibility criteria for direct payments will be continually refined to align more closely with those of agriculture and fisheries, ensuring fairness and inclusivity. A sophisticated information system, 'Forester Support Integrated Information System,' will be established to streamline and manage subsidy projects and private forest management. This system will leverage forestry business registration data to provide seamless support to forest sectors.

In anticipation of natural disasters exacerbated by abnormal climate conditions, disaster insurance coverage will be expanded to include a wider range of forest products. Additionally, the unit cost for natural disaster recovery support will be adjusted realistically to ensure effective assistance. Recognizing the shortage of forestry production workers due to demographic shifts and aging, establishing labor supply forecast statistics, and designation of a specialized human resources support institution will be prioritized. This institution will manage the recruitment and operation of foreign labor, incorporating a flexible 'workplace addition' system that aligns with seasonal job demands. Efforts to enhance the professional management capabilities of forestry workers will be intensified through expanded education and consulting programs. These initiatives will cover various aspects of forestry management, including producing and distributing forest products and utilizing social media networks (SNS). Incentives such as advanced training, workshops, and recognition as forestry experts will be provided to outstanding foresters, with successful models disseminated widely to inspire others.

2) Encouraging Youth Participation in Forestry

To attract young individuals to the forestry sector, comprehensive support will help them establish stable lives early on. This support encompasses various aspects, such as land acquisition, financial support, and education. Initiatives will be introduced to facilitate young foresters' access to land coupled with financial assistance tailored to their needs. Enhanced loan support will be available to those requiring more favorable repayment terms and collateral options. Practical training programs integrate specialized high schools and entrepreneurship education to provide hands-on experience and skill development opportunities. Moreover, the educational curriculum in professional educational institutions will be structured into progressive stages, focusing on knowledge acquisition, basic skills, and advanced techniques. Young foresters will be given expanded opportunities to engage in actual forestry projects, allowing them to apply their skills and knowledge in practical settings. Support for technology commercialization, patent applications, and establishment of R&D-based startups will also be provided. To facilitate the integration of young foresters into local communities, regional networks centered around experienced forestry households will be established. These networks will serve as platforms for communication, knowledge exchange, and mentorship, fostering a sense of belonging and collaboration within the forestry community.

3) Promoting Regional Forest Product Brands and Industry Development

Efforts are underway to develop and elevate regional specialty forest products through brand building, production history management, and collaborative support for processing and distribution facilities. This initiative aims to nurture region-specific industries and enhance their competitiveness in the market. Support is provided for the modernization and expansion of facilities, particularly through establishing production complexes for short-term income forest products and comprehensive management projects. These initiatives seek to enhance productivity and meet evolving consumer demands. To adapt to changes in the consumer landscape, there is a focus on digitizing the distribution process of forest products and enhancing information dissemination. This includes leveraging technology to streamline supply chains and improve transparency for consumers. Emphasis is placed on developing high-value-added products to capture niche markets and increase profitability. Additionally, efforts are underway to establish forest product clusters that foster collaboration between industry, academia, and research institutions to drive innovation. The mandatory fund system, which facilitates preemptive and autonomous supply management of forest products by producers, will be expanded. This system ensures stability in supply while empowering producers to manage their resources effectively.

Initiatives aim to improve consumer perception of forest products to boost market competitiveness and stimulate consumption. This includes participation in national integrated brand projects like K-Forest Food, collaborating with renowned chefs, and leveraging social media for promotion. Matching sales channels and strengthening self-reliance capabilities for foresters by growth stage are being pursued. Support is provided to foresters at various stages of growth, including entry into online stores, live commerce platforms, and premium food outlets. Consulting services for product development and sales channel optimization are available to ensure forest product businesses' stable and sustainable growth.



Figure 1. Support Project Roadmap

4) Improving the Global Competitiveness of Korean Forest Products

Efforts are underway to bolster the global competitiveness of Korean forest products through strategic initiatives aimed at expanding export opportunities and enhancing product quality and branding. Establishing and professionalizing the 'K-Forest Product Export Expansion Headquarters,' along with product-specific export organizations and councils, are being prioritized. These entities streamline export processes, foster collaboration, and provide specialized support to exporters. Specialized areas dedicated to export activities will be designated as focal points for promoting the export of forest products. This support includes assistance with packaging, logistics, marketing, and compliance with export regulations to ensure smooth and successful export transactions. Efforts are underway to identify emerging items and untapped export markets with significant growth potential. By diversifying both the range of forest products exported, and the countries served, Korean exporters aim to expand their global footprint and capture new opportunities.



Economic Contributions to National Income

Part

5

The economic contributions of NTFPs are multifaceted and significant, particularly in rural regions where they serve as vital sources of income and livelihoods for local communities. The cultivation, harvesting, and trade of NTFPs play a pivotal role in shaping the economic landscape of Korea, making noteworthy contributions to the national income in several ways:

- 1. Employment Generation and Rural Development:** NTFP activities serve as crucial sources of employment in rural areas, offering income generation and livelihood improvement opportunities. A substantial portion of households in rural Korea rely on NTFP-related activities for their primary or secondary incomes. This employment opportunity helps alleviate poverty and fosters economic development in rural communities.
- 2. Export Potential and Trade Balance:** Korea's NTFPs, particularly wild-cultivated ginseng and forestry mushrooms, hold significant export potential due to their high demand in international markets. The export of these products contributes to the country's trade balance by generating foreign exchange earnings. As such, NTFPs play a crucial role in boosting the country's export sector and enhancing its economic competitiveness on the global stage.
- 3. Promotion of Sustainable Development and Environmental Conservation:** The sustainable management of forest resources for NTFP production plays a pivotal role in promoting environmental conservation and biodiversity conservation. By emphasizing sustainable harvesting practices and ecosystem-friendly management approaches, NTFP activities contribute to maintaining the ecological balance and integrity of the forest ecosystems. This ensures the long-term viability of NTFP production and enhances the intrinsic value of forest resources. Moreover, the emphasis on sustainability aligns with global trends favoring eco-friendly and ethically sourced products, thereby enhancing the marketability and competitiveness of Korea's NTFPs in both domestic and international markets.

Challenges and Future Directions

While NTFPs play a crucial role in Korea's economy, the sector has challenges. Factors such as overharvesting, habitat destruction, and the impacts of climate change pose significant threats to the sustainability of these resources. To navigate these challenges and ensure the continued viability of NTFP industries, concerted efforts are underway by the Korean government and various stakeholders. These efforts focus on several key areas: sustainable management practices, research and development, value addition and market competitiveness, policy support, and stakeholder collaboration (National Forestry Cooperative Federation, 2024).



The future outlook for non-timber forest products (NTFPs) is marked by several key trends that are reshaping the industry landscape and driving its growth potential:

1. **Growing Demand for Natural and Organic Products:** With a global shift towards health-conscious lifestyles, there is a rising demand for natural, organic, and sustainably sourced products. NTFPs, known for their inherent purity and eco-friendly production methods, are well-positioned to capitalize on this trend and experience increased demand domestically and internationally.
2. **Technological Advancements:** Ongoing innovations in cultivation, harvesting, and processing technologies are revolutionizing the NTFP industry. These advancements enhance productivity and efficiency and enable the sustainable management of forest resources, ensuring the long-term viability of NTFP production.
3. **Environmental and Sustainability Concerns:** Heightened environmental awareness and sustainability concerns drive consumers to seek out responsibly sourced and harvested products. NTFPs, when managed sustainably, contribute to biodiversity conservation and ecosystem health, aligning with the growing demand for environmentally friendly goods.
4. **Cultural and Heritage Revival:** There is a resurgence of interest in traditional Korean culture and heritage, leading to a renewed appreciation for traditional NTFPs. This cultural revival creates opportunities for the domestic markets as consumers seek products deeply rooted in Korean traditions and practices.

By capitalizing on these emerging trends and embracing sustainable practices, the NTFP industry is poised for significant growth and expansion in the coming years, offering promising prospects for producers and consumers alike.

Future Prospect of NTFPs

Part

6

Challenges Facing the NTFP Industry

Despite the promising prospects, the non-timber forest product (NTFP) industry encounters several hurdles that need to be addressed to ensure its sustainable growth:

1. **Sustainability Concerns:** One of the foremost challenges is the sustainability of NTFP harvesting practices. Overharvesting and habitat threaten the long-term viability of certain NTFPs, jeopardizing their ecological balance and future availability.
2. **Climate Change Impacts:** The increasing erratic climate patterns, characterized by rising temperatures and altered precipitation regimes, disrupt many forest species' growth cycles and geographical distribution. This poses significant challenges for NTFP cultivation and harvest, affecting quantity and quality.
3. **Market Access and Value Addition:** Small-scale NTFP producers often struggle to access markets, particularly there is a pressing need for value-added processing to enhance the marketability and profitability of NTFPs, enabling producers to capture more significant returns from their efforts.
4. **Regulatory and Policy Frameworks:** The absence of conducive regulatory and policy frameworks poses a significant obstacle to the sustainable development of the NTFP sector. There is a pressing need for supportive policies that promote sustainable harvesting practices, facilitate market access for small producers, and incentivize value-addition initiatives.

Addressing these challenges requires concerted efforts from various stakeholders, including governments, industry players, and civil society organizations. By implementing appropriate measures to promote sustainable practices, enhance resilience to climate change, improve market access, and enact supportive policies, the NTFP industry can overcome these hurdles and realize its full potential as a driver of rural development and environmental conservation.

Future Prospects and Opportunities for Republic of Korea's NTFP Industry Looking ahead, the non-timber forest product (NTFP) industry in Republic of Korea presents promising avenues for growth and development, offering various opportunities:

1. **Sustainable Certification and Branding:** Introducing certification programs for sustainably harvested NTFPs and developing strong branding initiatives can enhance market access and consumer trust. By aligning with international standards for sustainability, Republic of Korea NTFP producers can tap into premium markets and command higher prices for their products.
2. **Research and Development (R&D):** Investing in R&D initiatives focused on sustainable cultivation techniques and value-added processing holds immense potential for the industry. By improving productivity product quality, and diversifying product offerings, R&D efforts can unlock new markets and increase profitability for NTFP producers.
3. **International Market Expansion:** With growing global interest in health and wellness products, there is a significant opportunity for the Korean NTFPs to expand into international markets. By leveraging the country's reputation for quality and innovation, particularly in traditional medicine and natural cosmetics, NTFP exporters can capitalize on emerging trends and access new customer segments abroad.
4. **Community-based Management:** Adopting community-based management approaches for NTFP resources can promote sustainability and social equity. Empowering local communities to actively manage and conserve their forest resources for long-term viability while fostering socio-economic development at the grassroots level. By prioritizing community engagement and inclusive decision-making processes, Republic of Korea can strengthen the resilience of its NTFP sector and maximize its socio-economic benefits for all stakeholders.



1. Good example of wild greens '산나물'

- Project Farmer : KIM Woong, Pygmalion Herb, a forest-based social enterprise in Muju, Jeonbuk Province
- Major products and areas : wild greens, 19 ha
- Annual income : KRW 79 million
- Major features



After spending 13 years as an executive at KT, a former telecommunications giant, he made the bold decision to return to rural life. Equipped with new-found knowledge from the Korea Forestry Promotion Institute's forest entrepreneurship program, he embarked on a journey of forest-based entrepreneurship.

His daughter and son-in-law joined him in this venture, and they also chose to embrace rural living. Together, they cultivate various forest products, including ferns, chestnuts, shiitake mushrooms, fiddleheads, and wild garlic. Notably, all their products are certified organic, reflecting their commitment to sustainable and eco-friendly practices.

Their business model emphasizes direct sales and online marketing, enabling them to reach a broader audience and generate year-round income. By leveraging the appeal of K-FOREST FOOD items, approved for their quality and authenticity, they have established a thriving enterprise rooted in nature's bounty.

Forest Multiple-Use Management: Case Studies

Part
7



Harvesting



Cleaning and screening



Packaging and sale

**2. Good example of Prickly castor oil tree
(*Kalopanax septemlobus*) '옴나무'**

- Project Farmer : JUNG In-Seung, Dawul Agricultural Association in Seosan, Chungnam Province
- Major products and areas : tree shoots, 100 ha
- Annual income : KRW 700 million
- Major features



In 1994, he pioneered the establishment of the country's largest cultivation site spanning 100 hectares by employing innovative vegetative reproduction techniques to propagate prickly castor oil tree roots. He collaborated with local foresters and founded a corporation dedicated to joint production and distribution, laying the foundation for a remarkable success story.

Today, their efforts account for an impressive 70% share of the national production of prickly castor oil tree shoots, totaling approximately 12 tons. Such is the demand for their products that they consistently sell out within two weeks, typically around mid-April.

Recognizing their contributions to the forestry sector, they received vital support in 2017 by establishing a Comprehensive Distribution Center for Mountain Areas. With a total cost of KRW 1 billion, this project received 50% funding from the government, further solidifying its position in the market.

Their dedication and innovation have resulted in substantial annual revenues, with prickly castor oil tree shoots in spring and stems in autumn generating an impressive KRW 700 million. This success underscores their entrepreneurial acumen and highlights the immense potential of sustainable forestry practices in driving economic growth and development.



Harvesting shoots



Screening



Packaging and sale

**3. Good example of Japanese lacquer tree
(*Toxicodendron vernicifluum*) '옻나무'**

- Project Farmer : LIM Young-bin, Asan Yak-seon Village Agricultural Association Representative in Asan, Chungnam Province
- Major products and areas : tree extract, 19 ha
- Annual income : KRW 120 million
- Major features



Over three decades, she has been instrumental in elevating the value of forest products and propelling the forestry industry forward, particularly through the innovative utilization of lacquer trees. Through dedicated research and development efforts, she has pioneered the creation of processed products derived from aged lacquer trees.

In a significant breakthrough, she obtained a patent in 2013 for a revolutionary processing technology that effectively removes the toxicity of lacquer while preserving its beneficial properties. This groundbreaking achievement has opened new avenues for the safe and sustainable use of lacquer tree derivatives in various industries.

Undeterred by past successes, she continues to champion the advancement of lacquer tree cultivation by adopting cutting-edge technologies. Her advocacy for advanced cultivation techniques aims to enhance productivity and quality. Ensuring a steady supply of high-quality lacquer tree products for diverse applications.

Recognizing her contributions to the forestry sector, she played a pivotal role in establishing a lacquer tree seed forest in Chungnam-do in 2017. This initiative facilitates the breeding of superior seeds and fosters the expansion of lacquer tree cultivation, promising a brighter future for the industry and the communities it serves.



Chipping and crushing



Fermentation,
high-temperature extraction



Packaging and sale

4. Good example of Mastic-leaf prickly ash (*Zanthoxylum schinifolium*) '산초나무'

- Project Farmer : HAN Chi-bok, Jirisan Sancho, Hadong, Gyeongnam Province
- Major products and areas : oil, 6.6 ha
- Annual income : KRW 1 billion
- Major features



Over a span of five years, from 2014 to 2019, he spearheaded the development and registration of seven new varieties of mastic-leaf prickly ash, marking a culmination of three decades of dedicated cultivation alongside his daughter. Within their operational domain, they manage a nursery spanning 1.3 hectares nested within a larger cultivation site covering approximately 6.6 hectares.

Their breeding efforts have prioritized the creation of varieties endowed with robust disease resistance and enriched with functional ingredients, reflecting a commitment to innovation and product excellence. Leveraging their deep understanding of mastic-leaf prickly ash's unique traits and optimal harvest times, they have disseminated techniques tailored to maximize yields and quality.

The fruits of their labor have translated into tangible success, with sales exceeding KRW 1 billion since the registration of the 'Hanchon10' variety in 2014. This milestone underscores their proficiency in variety development and ability to capture market demand and deliver value through their exceptional products.



Harvesting seeds



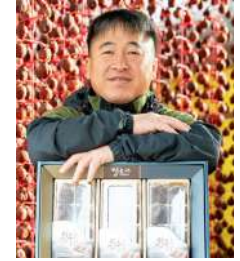
Extraction oil



Packaging and sale

5. Good example of dried persimmon '꽃감'

- Project Farmer : PARK Yongmin, Malgeum Agricultural Association, Wanju, Jeonbuk Province
- Major products and areas : dried persimmon, 33 ha
- Annual income : KRW 90 million
- Major features



With a steadfast commitment to quality, they specialize in crafting premium black persimmons employing time-honored drying techniques. Over a span of 15 years, they have diligently tended to their persimmon orchards, resulting in an annual yield of 100,000 persimmons.

Their dedication to excellence extends beyond cultivation, as evidenced by their continual investment in enhancing production facilities. Notably, they have upgraded their infrastructure to minimize dust accumulation, ensuring a hygienic environment for persimmon processing. Moreover, they have implemented innovative measures, such as applying fertilizers and microbial agents, to optimize growth conditions and foster superior forest product production.

Through meticulous attention to detail and a commitment to innovation, they stand at the forefront of persimmon cultivation, consistently delivering high-quality produce that embodies their unwavering dedication to excellence.



Harvesting persimmons



Drying persimmon



Screening and packing

**6. Good example of Korean raspberry
(*Rubus crataegifolius*) '산딸기'**



- Project Farmer : CHOI Seok-yong, Raspberry dot com, an agricultural corporation in Gimhae, Gyeongnam Province
- Major products and areas : jam, vinegar, and wine, 0.7 ha
- Annual income : KRW 1 billion

- Major features

Having embraced rural life over two decades ago, they embarked on a journey to cultivate premium organic raspberries, eschewing the use of fertilizers and pesticides. What began with just five farming households has blossomed into a thriving community encompassing over 500 households nationwide.

Their dedication to organic farming practices has yielded exceptional raspberries and paved the way for the development of an array of processed and fermented raspberry products. Each creation bears testament to their unwavering commitment to quality and innovation, from tantalizing fermented jams to exquisite vinegars and wines.

Beyond their agricultural pursuits, they have transformed their farm into a captivating destination, attracting hundreds of thousands of visitors annually. Their raspberry wine cave and train cafe offer immersive experiences, providing visitors with a delightful journey through the world of raspberries.

As stewards of sustainable agriculture and purveyors of artisanal delights, they inspire and delight, leaving an indelible mark on their community and the broader agricultural landscape.



Harvesting



Compression and fermentation



Extraction

**7. Good example of wild-simulated ginseng
(*Panax ginseng*) '산양삼'**



- Project Farmer : JI Kyung-hwan, Pyeongchang 365, Pyeongchang, Gangwon Province
- Major products and areas : wild-simulated ginseng root, medicinal herbs, 30 ha
- Annual income : KRW 1 billion
- Growing or cultivating area in ha

- Major features

With an annual revenue surpassing KRW 500 million, they are at the helm of a thriving enterprise specializing in wild-simulated ginseng and medicinal herbs in Pyeongchang. Their endeavor holds special significance, as Pyeongchang has been designated as a special district for wild-simulated ginseng since 2015, boasting the first national geographic indication for such ginseng.

Their commitment to excellence is further exemplified by the involvement of their two sons, who joined the family's rural venture in 2014. Together, they have played a pivotal role in distributing superior seeds, earning recognition as a designated private wild-simulated ginseng seed garden in 2020.

Through their dedication and expertise, they have established a successful business and contributed significantly to the preservation and promotion of Pyeongchang's rich botanical heritage. Their legacy continues to flourish, leaving an enduring impact on both the local community and the wider realm of herbal cultivation.



Harvesting



Packaging



Online sales

6. Good example of pine nut (*Pinus koraiensis*) '잣'

- Project Farmer : KIM Eun-sil, Hanel-bi(Sky Rain) Agricultural Corporation, Chuncheon, Gangwon Province
- Major products and areas : pine nuts, 29ha
- Annual income : KRW 1 billion



- Major features

Returned to rural life 17 years ago, creating income by collectively harvesting pine nuts under a national forest protection agreement. Established the corporation in 2017, installing distribution and processing facilities for pine nuts. Achieved over KRW 1 billion in annual sales. Enhance competitiveness through the development and nurturing of experiential products. Promote rural life on the YouTube channel "Wise Mountain Village Life of Hanel-bi."

Conclusion

Short-term income products (Non-Timber Forest Products: NTFPs) are a cornerstone of the Republic of Korea's economy, driving rural development, bolstering exports, and championing sustainable environmental practices. As we progress, a steadfast commitment to sustainable management and value-added processing promises further expansion and prosperity for the sector. By leveraging these approaches, we not only unlock new economic opportunities but also uphold the preservation of Korea's diverse forest biodiversity, safeguarding it for future generations' prosperity.



Harvesting and loading of pine cones



Skinning



Online sales (Hanel-bi jat)

Literature Cited

Arnold, J.E.M., C. Liedholm, D. Mead, and I.M. Townson. 1994. Structure and growth of small enterprises using forest products in southern and eastern Africa. OFI Occasional Paper No 47. Oxford Forestry Institute, Oxford.

Chandrasekharan, C. 1994. Non-wood forest products: a global view of potentials and challenges. Paper for the International Seminar on Management of Minor Forest Products. Dehra-Dun, India, 13-15 November 1994. FAO, Rome.

EC-FAO Partnership Programme. 2002. Non-wood Forest Products in 15 Countries of Tropical Asia. An Overview. Information and analysis for sustainable forest management: linking national and international efforts in South and Southeast Asia. Bangkok. 188 p.

FAO [Food and Agriculture Organization of the United Nations]. 1995. Non-wood forest products for rural income and sustainable forestry. Non-wood Forest Products 7. Rome. 127 p.

FAO [Food and Agriculture Organization of the United Nations]. 1997. Medicinal plants for forest conservation and health care. Non-wood Forest Products 11. Rome. 158 p.

FAO [Food and Agriculture Organization of the United Nations]. 2002. Non-wood forest products for temperate broad-leaved trees. Non-wood Forest Products 15. Rome. 125 p.

FAO [Food and Agriculture Organization of the United Nations]. 2009. Non-farm income from NWFPs.

FAO [Food and Agriculture Organization of the United Nations]. 2013. Edible insects: Future prospects for food and feed security. FAO Forestry Paper 171. Rome. 187 p.

FAO [Food and Agriculture Organization of the United Nations]. 2013. Non-Wood Forest Products are vital for the future of forest dwellers. Pamphlet. Rome. 2 p.

Iqbal, M. 1993. International trade in non-wood forest products: an overview. FAO Forest Products Working Paper Misc/93/11. FAO, Rome.

Korea Forest Service. 2023. Production of Forest Products. pp. 21-23, 27-34.

Korea Forest Service. 2023. Statistical Yearbook of Forestry. pp. 290-303.

Korea Forest Service. 2023. 2024 Guidelines for the Implementation of the Forest Income Sector(2024년 산림소득분야 사업시행지침). pp. 41-61.

Korea Forest Service. 2023. 2024 Detailed Implementation Plan for Major Tasks (2024년 주요업무 세부추진계획) pp. 129-132, pp. 224-248.

Korea Forest Service. 2024. A Collection of Forestry Workers and Forestry Products of the Month (2022~2023년 산림청 선정 이달의 임업인 및 청정임산물 모음집). pp. 10-26.

National Forestry Cooperative Federation. 2024. 2024 Guide to Private Forest Management(2024 사유림경영안내). pp. 6-17.

Toledo, V.M., A.I. Batis, R. Becerra, E. Martinez and C.H. Ramos. 1992. Products from the tropical rain forests of Mexico: an ethnoecological approach. In M. Plotkin and L. Famolare (eds.). Sustainable Harvest and Marketing of Rainforest Products. Conservation International, Washington, D.C.

Wickens, G.E. 1990. What is economic botany? Economic Botany 44: 12-28.

