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Policy Arrangement Approach to the Wild Simulated Ginseng Industry in the Republic of Korea

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※ 외국어초록(Abstract)

Abstract

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Global interest in non-timber forest products (NTFPs) is increasing considering its contribution to improving and diversifying forest livelihoods. In the Republic of Korea (ROK), wild simulated ginseng (WSG), an NTFP, has received attention in terms of promoting the livelihood of mountain villages and providing healthy food. The government's policy for supporting the production of WSG has for decades been established and implemented according to the National Forest Plan. This paper aims to scrutinise the changes in policies for improving the cultivation and trade of WSG in the ROK. Using a policy arrangement approach, four dimensions are analysed: 1) discourses on WSG, 2)

rules for cultivating WSG, 3) participation and cooperation of actors, and 4) actors' resources or power. Chronological changes in the discourse and regulations related to NTFPs and WSG, the relationships between multiple actors, the resources and power for designing and implementing policies on WSG quality management are indicated. The results show that the policy for the WSG industry in the ROK has been established and implemented through the close interconnection of four dimensions. Policies are led by the government with a command-control approach in the quality management system, with a focus on regulation reinforcement and insufficient resources to conduct the policy. This study provides a comprehensive view of the dynamic procedure of policy implementation with practical example cases of the WSG industry in the ROK. It provides evidence of the dominant power of government in the development of the WSG industry.

Keywords: NTFP, wild simulated ginseng, quality management, policy analysis, Republic of Korea

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Contents

List of Tables

List of Figures

List of Abbreviations

CFF : Clean Forest Food

EUR : Euro (currency)

EU : European Union

FAO : Food and Agriculture Organization of the United Nations

FPQCA : Forest Product Quality Control Association

GAP : Good Agricultural Practice

HACCP : Hazard Analysis and Critical Control Point

ISO : International Organization for Standardization

KFS : Korea Forest Service

KISTI : Korea Institute of Science and Technology Information

Kofpi : Korea Forestry Promotion Institute

KSFS : Korean Society of Forest Science

KWSGA : Korea Wild Simulated Ginseng Association

MAFRA : Ministry of Agriculture, Food and Rural Affairs

NFCF : National Forestry Cooperative Federation

NFP : National Forest Plan

NGO : Non-Governmental Organization

NTFP : Non-Timber Forest Product

NWFP : Non-Wood Forest Product

PAA : Policy Arrangement Approach

PDO : Protected Designation of Origin

PGI : Protected Geographical Indication

ROK : Republic of Korea

TSG : Traditional Specialty Guaranteed

USA : United States of America

USD : US Dollar (currency)

WSG : Wild Simulated Ginseng

1. INTRODUCTION

Non-timber forest products (NTFPs) were in 1989 defined as ‘all biological materials other than timber which are extracted from the forest for human use’ (De Beer and McDermott 1989). Ten years later, the Food and Agriculture Organization (FAO) (1999) defined it with a new concept, namely non-wood forest products (NWFPs), as ‘all goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests’ elaborating that ‘NWFPs may be gathered from the wild, or produced in forest plantations, agroforestry schemes and from trees outside forests’ (FAO 1999). In older times, NTFPs were mainly extracted and collected from forests. However, as per the FAO, they have also been produced in or near forest areas. Recently, NTFPs have been emphasized because of their role as tools for rural diversification generating sustainable forest communities and as bioproducts to be processed and converted into various materials such as chemicals, fuels, and medicines (Duchesne and Wetzel 2003).

Unlike timber products, NTFPs were collected and harvested to be consumed by households, and only a small amount thereof was sold (FAO 2010). However, sales activities

were growing, and raw or semi-processed material was commonly traded along several local or international supply chains since the Second World War (Iqbal 1995). From EUR 1.1 billion in 1995, the production value of NTFPs in Europe increased to EUR 4.53 billion in 2007 (Vidale 2016: 8). Investors realized that the forests provided not only wood and wood products, but also the NTFPs, which may be worth approximately 40% of the wood and biomass value. Consequently, governments began establishing quality standards and new rules to control the import of NTFPs (Vidale 2016). NTFPs contribute to promoting the livelihood of forest communities and to forest conservation from land-use changes (Ros-Tonen 2000, Kusteres *et al.* 2006). However, collecting NTFPs can negatively impact natural forests and wildlife conservation (Gubbi and Macmillan 2008). Therefore, strategic policies to balance livelihood development and environmental conservation are necessary (Kusteres *et al.* 2006).

Wild simulated ginseng (WSG), a type of NTFP, has received attention since 1982 (Carpenter *et al.* 1982). It has also been called mountain cultivated ginseng, forest cultivated ginseng, wild cultivated ginseng, among other names. The most commonly used names are mountain cultivated ginseng and WSG, but currently, WSG is the official name recorded in government

documents in major producing countries such as the United States. The Fish and Wildlife Service of the United States introduces WSG as ginseng having wild-like characteristics and shapes grown in a forest environment under natural conditions with no cultivation of the plants (US Fish & Wildlife Service 2020). In the Republic of Korea (ROK), according to 'the Forest and Mountain Villages Development Promotion Act', WSG is defined as a 'plant of the Ginseng genus under the Eleutherococcus family that is cultivated in mountainous districts pursuant to detailed cultivation conditions including no anthropogenic shade and cultivation but fence for protection from wild animals'. In both countries, it is emphasised that WSG should be grown in woody areas without artificial cultivation techniques.

In the ROK, the forest product industry, has mainly focused on timber products considering the various roles of the country's forests and economic benefits thereof. The interest in NTFPs emerged to improve the low-income status of forest households related to the long-term and low capital recovery rate of timber cultivation. Reflecting considerations on biodiversity, the quality of forest soil, and effectiveness in using marginal farmland and forest resources, the government started to support

the NTFP industry legally by adding supportive provisions in the ‘Forestry and Mountain Villages Development Promotion Act’ on 31 December 2001.

The government also tried to ensure the production of high-quality, clean, and healthy WSG through a quality management policy. The Forest and Mountain Villages Development Promotion Act regulates the detailed condition of the whole quality management procedures from the preparation of cultivation to sales to control the quality process of WSG. In addition to the quality management policy, WSG-related policies have been implemented in the flow of discourse on forest resources. These have included amendments of the Act and other related rules with the cooperation of various actors exercising their power through their resources. This paper aims to analyse the changes in policies for improving the cultivation and trade of WSG in the ROK from the multi-aspect viewpoints stated above, and to provide recommendations considering the balance of various aspects of policy implementation.

2. LITERATURE REVIEW

Research on the WSG has been conducted from natural science

and social science perspectives. A search on SCOPUS and Web of Science, global research article databases, yielded an article written in 1982, the earliest one published about the growth and reproduction of WSG in Wisconsin, USA (Carpenter *et al*. 1982). Research on WSG increased in the 2000s. The different properties of WSG from the field cultivated ginseng have received attention because of their high economic value for mountain villages and the agroforestry cultivation system for reducing environmental burdens (Hankins 2000). The conditions and methods for cultivating WSG have been analysed (Charest *et al.* 2000, Nadeau *et al.* 2003), and scientific analysis of the components of WSG and its effects and applications has been conducted. The specific characteristics of WSG in chemical, genic, and metabolomic viewpoints compared to other kinds of ginseng such as field cultivated ginseng and wild ginseng (Bu *et al.* 2013, Chang *et al.* 2016, Kwon *et al.* 2011, Liu *et al.* 2008, Suh *et al.* 2010, Xu *et al.* 2013, Yong *et al.* 2007), as well as the medicinal effects of its components have also been analysed (Jang *et al*. 2008, Suh *et al.* 2011, Lee *et al*. 2012, Tran *et al.* 2016, Li *et al.* 2017, Tu *et al.* 2017). Based on research on other types of ginseng including wild and field cultivated ginseng, the root contains ginsenosides, polyacetylenes, ginseng proteins, polysaccharides, and

phenolic compounds. The types of ginsenosides can be listed as Rb1, Rb2, Rc, Rd, Rg1, Re, Rf, and Rg2, and they have proven efficacy in terms of anti-oxidation, anti-cancer, blood pressure control, liver function, anti-inflammation, and in decreasing lipids (Suh *et al.* 2010, Yang *et al.* 2019). Studies on the abovementioned subjects, reveal that the ginsenoside content in WSG is higher than that in field cultivated ginseng, especially in terms of phenolic content for anti-oxidation (Jang *et al*. 2008, Yang *et al*. 2019). Some researchers have analysed the characteristics and medicinal effects of WSG focusing on the cultivated area, growth year, and plant part (Chang *et al.* 2017, Yang *et al.* 2019, Fan *et al.* 2019). Various application methods of WSG in commercial products in the beauty and food industry have also been studied (Kim *et al.* 2018, Lee *et al*. 2019).

In addition, some studies on WSG from a social scientific approach handle the issues of the social system and institutional strategies for promoting the WSG industry to improve the livelihoods of mountain villages, public health, and forest ecosystems. Their major areas of focus include industry development strategies (Kim *et al.* 2005), quality management (Kim *et al.* 2009, Kim *et al*. 2012), customer valuation (Kim *et al.* 2012), the cultivation environment and context (Beon *et al*.

2013, Burkhart 2013, Carpenter and Cottam 1982, Charest *et al*. 2000, Han *et al.* 2011, Kim *et al.* 2013, Kim *et al.* 2015. Lee 2010, McGraw *et al.* 2005, Souther and McGraw 2011, Woo *et al*. 2004, Yang *et al.* 2010), genetic diversity and conservation (Burkhart *et al.* 2012, Cruse-Sanders and Hamrick 2004, Jang *et al*. 2020, Li *et al*. 2011, Li *et al*. 2015, McGraw *et al.* 2013, Meier *et al*. 2018. Snow and Snow 2009, Hwang *et al*. 2006), and management strategies (Choi *et al.* 2016, Jeon *et al.* 2014, Ji *et al.* 2013). However, there is a lack of research on identifying stakeholders and their interactions and on interpreting governmental policies to support the production and quality management of WSG. An analytical and institutional approach is necessary to understand policies for pertaining to WSG.

Therefore, this study attempts to interpret the dynamic changes in WSG policies in the ROK as one of the major countries producing WSG. Using the policy arrangement approach, this study analyses the discourse, actors, their resources and power, and rules of the game in the production and quality management of WSG over time in the ROK. It provides insights for understanding the institutional structure and for designing policies to improve the production and quality management of WSG.

3. QUALITY MANAGEMENT

Quality management has been highlighted as an interesting research field in management science for many sectors of the economy such as manufacturing, service, healthcare, education, and government (Nair 2006). Quality management is defined as an integrated approach to achieving and sustaining high-quality output, focusing on the maintenance and continuous improvement of processes, and preventing defects at all levels and in all functions of the organisation to meet or exceed customer expectations (Flynn *et al*. 1994: 342). This definition explains the applicable range of timing, method, and purpose of quality management. Reflecting the situation of the times, some initiatives including Total Quality Management emerged in the late 1980s and early 1990s. However, it is now a general sentiment that quality management is essential and fundamental for the effective and competitive management of any organisation (Nair 2006).

In the food industry including forest and agricultural edible products, quality refers not only to the features constituting something or standards of excellence, but also to the capability of a product to achieve its intended purpose and satisfy consumers'

needs. This is because consumers have the final authority in purchasing products based on their knowledge of a food including safety, purpose of use, and private preferences (Manikas *et al*. 2016). Consumers consider various aspects when deciding on a product for their intended purpose. They consider various attributes when making a decision. Quality management also deals with these attributes (Batt 2015, Mujawamariya *et al*. 2016, Peri 2006, Pradhan and Pradhan 2015). For fresh food in particular, food safety is most important, because there is a risk of chemical, physical, and microbial contamination. Regarding the physical attributes of a product, the commodity aspect is considered, such as its shape, size, colour, freshness, firmness, maturity, sweetness, acidity, blemishes, and abrasions. This element is addressed in laws, regulations, or voluntary rules, as it is easy to measure and usually reflects the condition of other attributes. Other primary considerations are nutritional aspects related to healthy components including flavonoids, vitamins, phenolic acids, and ginsenosides, as well as sensory aspects perceived by the five senses such as taste, flavour, texture, and appearance. Production and ethical aspects are related to the origin of the product and production process, which considers organic techniques, environment-friendly method, animal welfare,

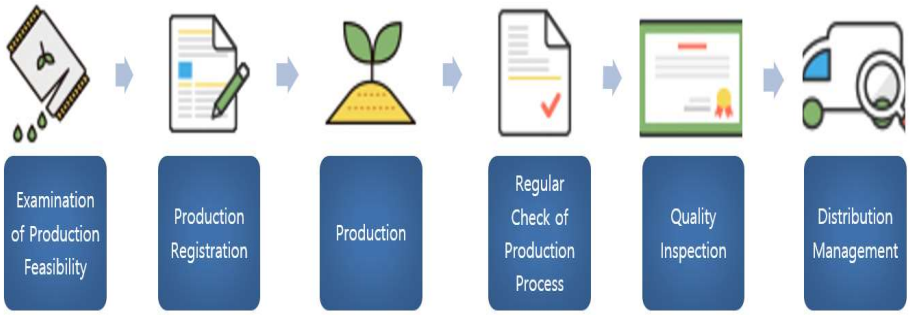
workers' welfare, and other related conditions. A food guarantee of certification, and labelling and product packaging can also be included in the list of considerations.

Reflecting the quality attributes stated above, there are many types of standards developed for food quality management at the local, national, and international levels as established by the government, NGOs, companies, or retailers. Examples include ISO9000 for quality management, ISO22000 for food safety management including the HACCP principles, ISO14000 for environmental management, ISO26000 for social responsibility, EU PDO for the protected designation of origin, EU PGI for protected geographical indication, EU TSG for traditional specialty guaranteed, Swedish Sickle for Swedish farmers, Danish IP for sustainable horticultural production, Marine Stewardship Council for sustainable fisheries, Arla Farm for the company's dairy products, Waddengroup Foundation for sustainable production in the region, and good agricultural practices (GAP) for sustainable good agricultural practice (Manikas *et al*. 2016, Pradhan and Pradhan 2015, Noor 2015, Rodrigues 2014). As the international food trade market grew, people began to compare the quality of imported and local products, and international quality standards became good facilitators for international trade and domestic

commerce where no specific standards had yet been established.

In the ROK, the quality management of agricultural food products is mainly controlled by three control programs implemented by the National Agricultural Products Quality Management Service. They are food safety inspection and regulation, origin labeling management, and certification of environment-friendly agro-fishery products and good agricultural practice (GAP), which are evaluated as beneficiary programs for society (Kwon *et al*. 2017). For forest food products and NTFPs, there are two major quality control methods conducted by the Korea Forest Promotion Institution. One is special management for legally specified products. WSG is the only product currently designated as a special forest product. All cultivators must abide by strict quality management processes. Imported products are also subject to quality inspection (Figure 1). The other is a certification as a Clean Forest Food (CFF). CFF is adjusted to edible NTFPs other than WSG as a voluntary certification for cultivators who want to use a logo demonstrating that the product is grown with no pesticides and no chemical fertilisers. This study deals with policies related to the quality management of the WSG based on the background information provided above.

FIGURE 1 Wild simulated ginseng quality management process



Source: Forestry and Mountain Villages Development Promotion Act and the Instruction of Quality Management (Kofpi, www.sam.kofpi.or.kr)

4. WILD SIMULATED GINSENG IN THE REPUBLIC OF KOREA

4.1. Status of Wild Simulated Ginseng

The general type of NTFP production in the ROK is forest farming to cultivate wild edible and medicinal herbs like WSG, which provides the highest income in terms of sales revenue (Min *et al.* 2013). The government has supported the development of the WSG industry by fostering the production of clean and healthy high-value products and a market environment to enhance public health and the livelihood of mountain villages. WSG has a similar shape to wild ginseng and is grown in a similar wild

environment. WSG is smaller and thinner than field cultivated ginseng but contains more medicinal ingredients, making it more expensive. Field cultivated ginseng is supposed to be cultivated through anthropogenic care including artificial shade, and an appropriate fertiliser, and water supply. Therefore, field cultivated ginseng is larger, thicker, and heavier than WSG. The volume of production quantity is also more than 136 times greater than that of WSG and more than 16 times its total value (Table 1).

TABLE 1 Prominent differences between wild simulated ginseng and field cultivated ginseng

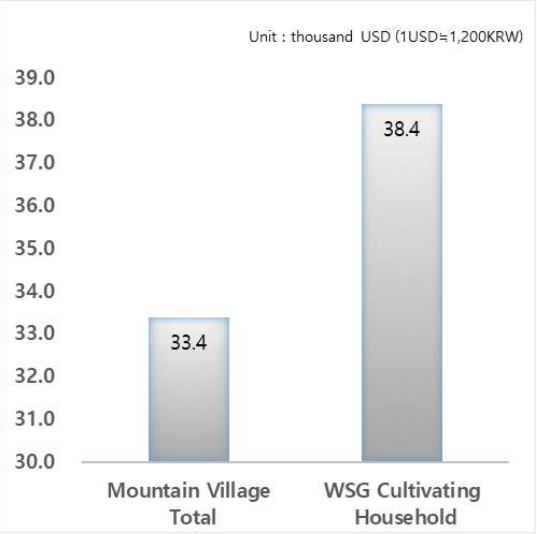
	Wild Simulated Ginseng	**Ginseng (Field Cultivated)**
Where	Forest	Farm
How	No manmade shade No fertiliser No pesticides, With fence	With manmade shade With fertiliser, With fence With a few allowed pesticides
How Long	4 to +10 years	4 to 6 years
Body Shape	Thin Body/Thick and Long Root	Thick Body/ Thin and Short Root
Production Amount	144t / 36mil.(USD) [2019]	19,582t / 586mil.(USD) [2019]
Market Price (per root, 2018)	4-year : 11.75(USD)	4-year : 2.8(USD)

Source: Statistics on Wild Simulated Ginseng 2018 (Kofpi 2019), Statistics on Ginseng 2018 (MAFRA 2019), Statistical Yearbook of Forestry (KFS 2019), Wild Simulated Ginseng Story (Kofpi, www.sam.kofpi.or.kr)

WSG is well-known for its effectiveness in promoting general health, especially for anti-cancer, anti-oxidation, and rejuvenation. It has been reported that compared to wild and field cultivated ginseng, the total phenolic content, which is an anti-oxidation ingredient in ginseng, is the highest in WSG (Jang *et al.* 2008). Because WSG is designated as a 'Special Forest Product' according to the Forestry and Mountain Villages Development Promotion Act, cultivators thereof must follow strict quality management procedures entailing an examination of production feasibility - production registration - production - regular check of the production process - quality inspection - distribution management (Figure 1). Rigorous quality management contributes to maintaining high-quality, clean, and high value-added WSG at a high price. The root price of 4-year-old WSG is approximately USD 11.75, which is almost four times the root price of field cultivated ginseng in the Korean market (Table 1, Kofpi 2019, MAFRA 2019). This high economic value based on its medicinal effectiveness and quality management is dedicated to improving cultivators' livelihoods. In 2018, the average WSG sales income of cultivating households was reportedly around USD 38 400, differing by about USD 5 000

from the average income of the mountain village total (Figure 2, KFS 2018, KFS 2019).

FIGURE 2 Annual average income of forest households and households cultivating wild simulated ginseng (2018)



Source: Statistics on Wild Simulated Ginseng (KFS 2018), Statistical Yearbook of Forestry (KFS 2019),

The estimated total production amount of ginseng worldwide is approximately 80 thousand tons, and more than 99% of the amount (79 769 tons) is produced in four countries, namely China, Republic of Korea (ROK), Canada, and the United States (Baeg and So 2013). It is difficult to find statistical data exclusively on WSG production at the national level in other

countries. In the United States, the WSG data are not separated from that for wild ginseng (US Department of Interior 2018). In Canada, planting, harvesting, and trading of wild ginseng, WSG, and wood-cultivated ginseng are strictly prohibited and controlled by the Endangered Species Act (Environment Canada 2014). In the ROK, the government collects and provides statistical data on WSG. The Statistical Yearbook of Forestry published by the Korea Forest Service (KFS) contains annual data on forest product production. The categories of forest products are timber, material for landscaping, net gross growing stock, tree seedlings, reforestation, soil and stone, nuts and fruit, medicinal herbs, wild vegetables, mushrooms, sap, resin, and others. Table 2 shows the production values of WSG, NTFPs, and forest products from 2001 to 2017. To calculate the production value of NTFPs, the production values of timber, material for landscaping, net gross growing stock, tree seedlings, reforestation, soil, and stone are excluded from the production value of the total forest product. The production value of WSG is provided separately under the medicinal herb category. It is recognised that the current production value of NTFPs accounts for approximately 25% of the total production value of forest products. WSG accounts for approximately 1.6% of the total NTFPs, which is the largest

portion of a single product under the medicinal herb category in the ROK.

TABLE 2 Production of forest products in Korea

(unit: million USD)

Year	A	Forest Product	B	Non-Timber Forest Product (B/A %)	C	Wild Simulated Ginseng (C/B %)
2001	2,554		972 (38.0%)		0.25	
2002	2,513		1,026 (40.8%)		0.41	
2003	2,664		976 (36.6%)		0.58	
2004	2,715		925 (34.0%)		1.83 (0.19%)	
2005	2,539		953 (37.5%)		9 (0.94%)	
2006	2,879		348 (12.0%)		13 (3.7%)	
2007	2,965		474 (15.9%)		9 (1.8%)	
2008	3,400		671 (19.7%)		11(1.6%)	
2009	4,026		993 (24.6%)		12 (1.2%)	
2010	4,614		1,045 (22.6%)		31 (2.9%)	
2011	4,772		1,130 (23.6%)		22 (1.9%)	
2012	5,625		1,692 (30.0%)		36 (2.1%)	
2013	5,758		1,655 (28.7%)		27 (1.6%)	
2014	6,513		1,785 (27.4%)		26 (1.4%)	
2015	6,948		1,778 (25.5%)		29 (1.6%)	
2016	7,669		1,760 (22.9%)		29 (1.6%)	
2017	7,471		1,868 (25.0%)		31 (1.6%)	

Source: Statistical Yearbook of Forestry (KFS, each year, NTFPs data includes that on nuts and fruit, medicinal herbs, wild vegetables, mushrooms, sap, resin, fuel, and others. Data on timber, material for landscaping, net gross growing stock, tree seedlings, reforestation, soil, and stone are excluded.)

4.2. Korean Research related to Wild Simulated Ginseng

The first officially recorded research on WSG in Korea is ‘A study on the development suggestions in mountain ginseng (*Panax ginseng* C. A. Meyer) industry’ published in 2005 by the KFS. Fifty-five academic papers and reports were collected from 2005 to 2017 from a Korean online database, namely the Koreanstudies Information Service System (KISS). Examining the research organisations that research the WSG industry promotion has been conducted systematically with the government leading. The Korea Forest Service (KFS) published ‘A study on the development suggestions in mountain ginseng (*Panax ginseng* C.A. Meyer) industry’ in 2005 and ‘A study on the Quality Standard of Wild Simulated Ginseng’ in 2009. From 2007 to 2013, the Korea Institute of Science and Technology Information (KISTI) conducted 15 basic commercialisation-related studies on the effectiveness of WSG in areas such as a liver protection, anti-cancer, and anti-oxidation, and analysed its characteristics according to the part, category, and cultivated country. The Korean Society of Forest Science (KSFS) started conducting research in 2007, ‘Research on the photosynthesis characteristic of WSG depending on the region and age’, and completing 25

studies from 2007 to 2015. Eleven of the 25 studies were in the field of social science, focusing on cultivation, growth, proper cultivation conditions, various mixed products, and management standards. The research on WSG in terms of the processes engaged in from its production to commercialisation conducted by the abovementioned government-related organisations means that the studies were systematically conducted and the results were reflected in the formulation of policy and implementation thereof.

5. RESEARCH DESIGN

Various methods have been used for forest policy analysis, such as systematic review (Amstrong *et al*. 2011, Shin *et al*. 2020), stakeholder analysis (Marks *et al*. 2009), content analysis (Krippendorff 2004), discourse analysis (Arts and Marleen 2009, Heeswijk and Turnhout 2013), policy instrument analysis (Krott 2005, Park 2009, Jang *et al*. 2015), and governance assessment (Stoker 1998, Kjaer 2004). Each has a specific viewpoint from which to analyse policy situations, problems, and ways to improve the process in terms of establishment, implementation, and evaluation. This research applied the policy arrangement approach (PAA) to analyse changes in WSG industry policies in

the ROK. PAA is used as a method to determine the dynamic changes of policies over time with interactive relationships between four dimensions: discourses, rules of the game, actors, and their resources or power. Policy arrangement refers to "the temporary stabilisation of the organisation and substance of a policy domain at a specific level of policymaking (Arts *et al.* 2000: 54)". The PAA is a method of policy analysis for understanding changes in policy practices and structures. By analysing each temporary situation and its continuous changes like a movie, the PAA makes it possible to describe the dynamics of changes in the policy process within a given policy domain. Therefore, PAA is an appropriate way to describe the dynamics of policy changes in four interwoven dimensions. In a policy arrangement, the discourse dimension refers to substantive aspects of policy, while the other three dimensions refer to the organisational aspects of policy (Liefferink 2006).

Discourse can be considered as the content of the policy. It is defined as "an ensemble of ideas, concepts, and categorisations that are produced, reproduced and transformed in a particular set of practices, and through which the meaning is given to physical and social realities" (Hajer 1995: 44). Forest policy discourse will be analysed using the National Forest Plans

by the KFS. Actors include formal and informal organisations and individuals participating in forest policy making and implementation, such as governmental and non-governmental forest organisations, corporations, forest owners and managers, and citizens. Actors' own resources include knowledge, technology, money, and material. The allocation of resources between actors leads to differences in power to influence the policy process (Park 2015). The rules of the game are rules related to the process of making and implementing policies, including national plans, laws, ordinances, decrees, declarations, and agreements.

PAA is regarded as a multi-aspect analysis methodology that combines the existing methods stated above. Each of the four dimensions (discourses, actors, resources, and rules of the game) shares the purpose and principles of analysis with related methods. For example, discourse analysis shares its principles with the discourse dimension analysis in PAA, stakeholder analysis with actors and resources dimensions, and policy instrument analysis with the rules of the game. PAA analyses the four dimensions individually and determines the relationships between them. The reasons for the multiple aspects and relationship analysis is that the situations taking place in the present are more complex than in the past. Researchers trying to look into this

complicated policy situation require complex methods to consider various aspects of the situation.

In this study, policy documents such as national plans, laws and ordinances, policy reports, and research articles on WSG from 1973 to 2020 were collected and analysed (Table 3). The National Forest Plan plays a role as a backbone of the forest policy-making process for long-term periods of 10 or 20 years. It is the most highly ranked forest policy document. According to 'the Framework Act on Forestry', the minister of KFS shall formulate and implement the National Forest Plan for nationwide forests so that sustainable forest management can be implemented based on long-term prospects (Article 11). The National Forest Plan is a standard for all regional forest and forest management plans. It provides principles and directions related to forest resources, the forest industry, forest wellbeing, forest ecosystems, forest land and villages, international forest cooperation, and forest administration. The mayors of the cities, governors of provinces, and chief of each regional forest service shall formulate and implement regional forest plans based on the characteristics of forests in the local areas under their jurisdiction in accordance with the National Forest Plan. The following legislation including content on WSG was analysed: the Forest and Mountain Villages

Development Promotion Act, WSG Cultivation Standard Guideline, and WSG Management Ordinances in Hamyang County, Pyeongchang County, and Hongcheon County. Information on WSG was categorised in relation to the four dimensions of PAA. In particular, at the local level, WSG policies were analysed in three counties, Pyeongchang, Hamyang, and Hongcheon, as designated special zones of WSG cultivation.

TABLE 3 Analysis materials

Type of document	Title of document	Year
Plan	National Forest Plans (the 1st - 6th)	1973 ~ 2037
Law	Forest and Mountain Villages Development Promotion Act	2019 (revised)
	Enforcement Decree of the Forest and Mountain Villages Development Promotion Act	
	Enforcement Rule of the Forest and Mountain Villages Development Promotion Act	
Guideline	WSG Cultivation Standard Guideline	2018 (revised)
Ordinance	Excellent Forest Products Support Ordinance in Hongcheon County	2015
	WSG Special Zone Management Ordinance in Pyeongchang County	2016
	WSG Industrial Complex Management Ordinance in Hamyang County	2018
Policy report	Regional Special Zone Operation Report of Hongcheon County, Pyeongchang County, Hamyang County	2020

6. RESULTS

6.1. Discourses

NTFPs as secondary forest products that enhance the livelihood of forest communities

In the history of Korean forest policy, forest planning was introduced in the early 1970s in the ROK. The 1st and 2nd National Forest Plans highlighted forest rehabilitation for land recovery after the Korean War (Park and Youn 2017). The overall objective of this period (1973-1988) in forest management was the reforestation of the whole country through public participation and contribution to land protection and livelihood enhancement. The 1st National Forest Plan intensively concentrated on greening through the supply of reforestation material, accountability management, special financial accounts, and public education. According to forest planning, the fruit tree zone including chestnut, walnut, persimmon, and jujube trees was established to increase short-term income (KFS 2013a: 327). In the 2nd National Forest Plan (1979-1988), interest in NTFPs was extended from fruits to various types of NTFPs, such as pine mushroom, shiitake mushroom, chestnut, acorn, pine resin,

arrowroot, oak bark, and stone. (KFS 2013a: 420). The Plan described NTFPs as 'secondary forest products' (KFS 2013a: 420). Timber was recognised as the main or primary forest product in Korean forestry. Timber supply was part of the prior forest policy. NTFPs ranked next to timber products (KFS 2013a: 420). The 2nd Plan stated specific strategies including technology transfer, financial support, and processing facility support for producing NTFPs. The Plan has the objective of maximising the production of NTFPs to enhance the livelihood of forest communities and increase export (KFS 2013a: 420). The 3rd National Forest Plan (1988-1997) focused on forest resource management. During this period, the basic stream of forest policy shifted from reforestation to forest resource management, emphasising forestry promotion and forest livelihood development. NTFPs were still described as secondary forest products. NTFP management policies were introduced, focusing on the establishment of NTFPs production complexes by regional specialties (KFS 2013a: 535-539). The items of the NTFP production complex, such as fruits, leaves, herbs, medicinal herbs, and mushrooms, were selected considering short-term profitability, a high price, and consumers' preferences. Around 127 cities and counties were targeted for producing NTFPs to improve short-term

income. The approach to NTFPs transitioned from the collection to cultivation of NTFPs. NTFP cultivation technologies have been developed and distributed. The 4th National Forest Plan (1998-2007) highlighted the distribution system of forest products including NTFPs (KFS 2013b: 44). Comprehensive distribution centres were established and the stages of distribution simplified. Export strategic items were intensively focused on, including products such as pine mushrooms and chestnuts, which was highly competitive and had a strong demand base in importing countries (KFS 2013b: 45). In the 4th National Forest Plan, NTFPs began to be actively considered export targets. The Plan started paying attention to new income products such as medicinal plants and WSG (KFS 2013b: 317). The 5th National Forest Plan (2008-2017) focused on green welfare. During this period, forest policies enforced forest ecosystem services for human welfare. NTFPs such as wild herbs and saps were named ‘clean forest products’ (KFS 2013b: 504-505). The Plan included strategies for constructing a production and distribution system such as traceability system and quality management certification. The 6th National Forest Plan (2018-2037) highlighted forest jobs, forest welfare, and forest ecology. The plan selected WSG as one of the eight export targets among the NTFPs (Table 4).

Clear here is that over time, the policy for NTFPs, which started with fruit trees at the time of reforestation, has expanded through the diversification of target products. Currently, the plan reinforces support and management by selecting specific products with potential.

TABLE 4 Policies on non-timber forest products and wild simulated ginseng in the National Forest Plans

National Forest Plan	Policy Focus	NTFP-related Keywords	WSG-related Keywords
1st (1973-1982)	Forest Rehabilitation	· Fruits · Livelihood	None
2nd (1979-1988)	Forest Rehabilitation	· Secondary forest products · Livelihood · Export	None
3rd (1988-1997)	Forest Resource Management	· Rational use of forest lands · Development of local livelihoods · Increasing forest products · Establishment of a complex for producing NTFPs · Improving the system of production and trade of NTFPs	None
4th (1998-2007)	Sustainable Forest Management	· Improving trade system of short-income forest products and export of forest products	· Supporting high income-related forest products
5th (2008-2017)	Green Welfare	· Improving the export of forest products · Improving the system of trading forest products and support · Developing a market for clean forest products	· Control of the process of production and trade · Establishment of legal framework

		· R&D focusing on special forest products · Capacity building for managing special forest products	· Establishment of infrastructure and cultivation technology · Building capacity for experts guiding cultivators of special NTFPs
6th (2018-2037)	Forest Jobs, Forest Welfare, Forest Ecology	· Improving income of forest livelihoods · Securing a stable production base with high product quality · Improving quality management of clean forest products and certification system · Improving the export of forest products	· Enhancement of export support

Source: National Forest Plan (KFS 2013a, 2013b, 2018)

Introduction of WSG

The 4th National Forest Plan was announced without a special title, but the main vision was indicated as 'Constructing the Foundation of Sustainable Forest Management' alongside other major projects. The 4th Plan includes supporting policies for the production and distribution of forest products and fostering strategic export items considering export promotion. In addition, integrated forest resource management was introduced, supporting the adoption of integrated management models such as the production of NTFPs connected with livestock, agriculture,

processing, the food industry, tours, leisure sports, and hunting. In particular, the 4th National Forest Plan records all changes in 2003 due to the global opening and domestic political situation. The new main vision of the changed latter-half plan was the 'Realisation of a Prosperous Green Nation Harmonised by Humans and Nature'. In addition, the bioecological aspects of the forest, local government participation, and site cooperation for each project were emphasised. The 4th Plan also directly mentions WSG, stating that it is a support extension product of potential high-income items alongside other medicinal herbs.

Designating WSG as a special forest product

The 5th National Forest Plan (2008~2017) established its vision as the 'Realisation of a Sustainable Green Welfare Nation', and proceeded with five strategies: 1) fostering and total management of multi-functioned forest resources, 2) fostering and improving the competitiveness of the resource recycling forest industry, 3) conservation and management of forests as a national ecological resource, 4) extension of the green area and service for improving the quality of life, and 5) expansion of international collaboration for resource security and preservation of the global forest. In particular, regarding fostering the resource recycling

forest industry, the plan establishes the core task of enhancing the competitiveness of short-term forest income products and fostering local industry clusters for the promotion of the NTFP industry. The Act reflects part of the plan to increase the added value of WSG through establishing distribution systems such as traceability and quality certification. Extending technical education for specialised products is also included. In 2012, the Korea Forestry Promotion Institution was established with the main purpose of controlling the quality management system. It also served as the momentum to promote the overall development capacity of forestry. The 5th Plan also changed in the latter-half period to support the expansion of a green economy. The vision of the changed plan was to establish a 'Green Welfare Nation where the People Enjoy Happiness'.

WSG as an export target product

The 6th National Forest Plan (2018~2037) is the first to adjust the new implementation period. According to the amendment of the 'Framework Act on Forestry' in 2017, the period of National Forest Plan was extended from 10 to 20 years. For the next 20 years, the vision of the 6th National Forest Plan is to create an 'Economic forest creating jobs, welfare forest enjoyed by

everybody, and eco-forest of human beings and nature'. The following eight strategic tasks are noted: 1) advancement of management systems on forest resources and land, 2) fostering the forest industry and job creation, 3) ensuring the stability of forest income and vitalisation of forest villages, 4) establishing the forest welfare system in everyday life, 5) maintaining and improving the health of forest ecosystems, 6) realising national safety through prevention and measures against forest disasters, 7) leading global forest cooperation and completion of reforestation in the ROK, and 8) establishing a foundation for forest policy. In the overall concept of the human-focused forest resource circular economy, NTFPs including WSG are important drivers for improving the income of forest households. Support for the promotion of the NTFP industry is included, which focuses on maintaining stable production, improving quality management, and encouraging the export of promising target products including WSG.

6.2. Rules of the Game

'The Forest and Mountain Villages Development Promotion Act' contributes to enhancing the quality of life for residents in

underdeveloped mountain villages, promoting the balanced development of national land and sound development of the national economy by promoting the rights and interests of forest managers, strengthening the competitiveness of forestry, and developing underdeveloped mountain villages through the structural improvement of forestry. As mentioned, the government's interests in NTFPs and WSG began based on promoting forest income and improving the livelihood of mountain village households. The government can control the quality and management of WSG by clearly stipulating related clauses, from the definition to disposal of WSG, in the Act and elaborating these in the sub-laws. The fact that the WSG quality management system was stipulated in the Act other than the enforcement decree or rule can be interpreted meaning that the government did not want the system to frequently change, because the Act can only be amended in the National Parliament.

The Forest and Mountain Villages Development Promotion Act was established in 1997 (Table 5). The article on supporting agroforestry management and mountain village development was added on 31 December 2001. The quality certification system was extended from timber to all forest products including NTFPs on 31 December 2004. The article specified agroforestry as a

‘short-term income business’ separately from wood production. On 4 February 2010, a new article on supporting education and training was established. In particular, a new chapter for the designation of WSG as a special forest product was added in 2010. Chapter 3 stipulates the WSG quality management system, which requires three steps: 1) investigation of productive suitability, 2) verification of the production process, and 3) quality inspection. Pursuant to the articles in Chapter 3, any person intending to produce WSG has to undergo an examination of the production feasibility by a specialised institution, and report the examination result to the minister of the KFS. After the report is accepted, cultivators must keep and manage production records on their cultivation of WSG. After cultivation, any cultivator or importer of WSG must take quality inspection for the distribution and sales. When it is confirmed that the WSG meets the standards for quality inspection, it must be packaged according to the standards prescribed by the law, and a label showing the results of the quality inspection must be attached on an easily noticeable place on the package. Implementation of the Act about Quality Management was supported by an enforcement decree and rules. The enforcement decree of the Act stipulates the tolerance limit of pesticide residue in the soil, seeds, and

seedlings (Article 17-3, 4, and 5). The enforcement rule stipulates the financial support for quality inspection fees in the case of passing the inspection (Article 25-12).

In Chapter 6, the establishment of the Korea Forestry Promotion Institute (Kofpi) was created on 25 July 2011 to increase forestry income and promote industrialisation by providing forest managers with support in relation to information on forestry management and the production and circulation of forestry products. Article 29-3 states Kofpi's accountability in the quality control of special forest products. On 21 March 2017, Article 18-2 about financial support for inspection fees of productive suitability was added. The definition of WSG was stipulated on 8 January 2019.

TABLE 5 Wild simulated ginseng quality management procedures and regulating articles

Procedure	Cultivator's Activity	Regulating Article
Preparation of WSG Cultivation	Preparing land, seed, seedlings	**Article 18-2 (Production of Special Forest Products)** (1) Any person intending to produce special forest products (including production of seeds and seedlings of special forest products; hereinafter the same shall apply) shall report thereon to the Minister of the Korea Forest Service, attaching the results of the examination of
Examination of production feasibility	Submitting application to Kofpi	
Production registration	Reporting to the local government of the cultivation land	

		production feasibility conducted by an institution or organisation specialising in the quality control of forest products prescribed by Presidential Decree
Production monitoring	Keeping and managing records of the production process	**Article 18-3 (Confirmation, etc., of Production Process)** (1) Any person producing special forest products (hereinafter referred to as 'producer') shall keep and manage records of the production process of such special forest products, as prescribed by Presidential Decree.
Quality inspection	Submitting application to Kofpi	**Article 18-4 (Quality Inspections)** (1) Any producer intending to distribute or sell special forest products or any person importing special forest products (hereinafter referred to as "importer") intends to clear such products, his/her products shall undergo the quality inspections conducted by a specialised institution prior to customs clearance.
Distribution and Sales	Attaching the quality label on the package	**Article 18-6 (Quality Labelling, etc.)** (1) Where a producer or importer intends to distribute, sell, or clear special forest products meeting the standards for quality inspections under Article 18-4 (3), he/she shall package them according to the standards prescribed by Presidential Decree. The foregoing shall also apply to a person reselling the special forest products purchased (hereinafter referred to as 'seller'). (2) When a producer, importer, or seller intends to distribute, sell, or clear special forest products, he/she shall put labels

	bearing the results of quality inspections under Article 18-4 (1) and (2) on conspicuous parts of such products.

Source: Forestry and Mountain Villages Development Promotion Act and the Instruction of Quality Management (Kofpi, www.sam.kofpi.or.kr)

The KFS provides officers and cultivators with various types of informational services such as official notifications, instructions, manuals, and guidelines. The WSG Cultivation Standard Guideline is published by the National Institute of Forest Science, an affiliate institute of the KFS. This guideline is produced to provide safe, healthful foods and clean forest products that satisfy customers and producers, especially for WSG as a special forest product. The first guideline was published in 2013 and recently revised in 2018 to become the second edition. The guidelines include the following information: 1) characteristics of WSG in terms of natural and social science, 2) environmental conditions for WSG cultivation areas and related legal requirements, 3) cultivation method, 4) overall management method, 5) seed management, and 6) harvest and the following procedures. The cultivators are supposed to comply with the guidelines, as WSG is under quality control as a special forest product designated by the Act (Table 5).

As an active strategy to promote the WSG industry at the local level, some local governments established industry development zones for WSG and operate the zones according to particular local government ordinances formulated to develop the WSG industry. Starting with the Hongcheon County in 2015, Pyeongchang County and Hamyang County established their ordinances in 2016 and 2018, respectively. The ordinance of Hongcheon County, entitled 'Support Ordinance for Excellent Forest Products', regulates institutional and financial support for WSG as one of the county's major forest products (Article 5). It states that the county can support research activities, meetings, various events, and subsidies related to the development of the WSG industry, and includes administrative procedures for this support (Article 4). The 'WSG Special Zone Management Ordinance' in Pyeongchang County is about the operation of the industry development zone and specialised business. Referring to the ordinance, a WSG Special Zone Management Committee should be established to steer the development zone. Regulations for its operation including composition and decision-making procedures are included in the ordinance (Article 6 and 7). To promote a specialised business, the ordinance also provides special exceptions for their public relations activities so that their

advertisements can be posted on public facilities (Article 4). The county governor must establish and implement a promotion plan for the specialised business of WSG covering its foundation construction, research and processing industry, and marketing (Article 5). The most recently established ordinance, Hamyang County's 'WSG Industrial Complex Management Ordinance', provides more details on the operation of the industrial development zone. In addition to the role and operation of the management committee, this ordinance regulates eligible businesses, operation times, usage fees, and management related to the industrial development zone (Chapter 2). The composition of the WSG Industrial Complex is also regulated in the ordinance. Facilities of the exhibition, distribution, plant incubation, and experience centre are mentioned as the main components of the industrial complex (Article 2).

It was noted that the regulatory aspects are strengthened in the rules of the game at the national government level by legal amendments of the Forest and Mountain Villages Development Promotion Act. This was initially supporting the WSG industry as an NTFP, and later controlling the quality management system when the WSG was designated as a special forest product (Table 6). At the local government level, support in the cultivation

process and public relations was handled based on such quality management.

TABLE 6 History of amendments on regulations related to wild simulated ginseng

Title of Article	Year inserted	Contents
Act / Article 9 (Support for Combined Management of Forests)	2001	The Minister of the Korea Forest Service or a Mayor/Do Governor may provide the support necessary for combined management of the production of wood and short-term income business so that forest managers may secure a sustainable and stable forest income.
Act / Article 11 (Quality certificate etc. of forest products)	2001, 2004	The Minister of the Korea Forest Service can implement quality certificates on forest products such as timber for the improvement of distribution quality and customer protection.
Act / Article 2 (Definition)	2010	The term 'special forest product' means any cultivated mountain ginseng and other forest products (including dried products) prescribed by Presidential Decree, subject to special management in terms of the protection of consumers and improvement of quality.
Act / Chapter 3 (Management of Special Forest Products)	2010	• Article 18-2 Production of Special Forest Products • Article 18-3 Confirmation of Production Process • Article 18-4 Quality Inspections • Article 18-5 Order of Destruction • Article 18-6 Quality Labelling • Article 18-7 Distribution Management of Special Forest Products • Article 18-8 Disclosure of Information • Article 18-9 Statistics Survey (inserted on 8 January 2019)

		• Article 18-10 Promotion of Export (revised all on 21 March 2017)
Enforcement Decree / Article 17-3, 17-4, 17-5	2011	• Article 17-3 Examination of Product Feasibility • Article 17-4 Confirmation of Production Process • Article 17-5 Quality Inspection
Enforcement Rule / Article 25-12 (Support for Quality Inspection Fee)	2017	The Minister of the Korea Forest Service can support whole or part of the quality inspection fee to producers who pass the quality inspection according to article 18-4-1 of the Act.
Act / Article 2 (Definition)	2019	The term 'Wild Simulated Ginseng' means the plant of the Ginseng genus under the Eleutherococcus family, which is cultivated in mountainous districts defined by the [Mountainous Districts Management Act], and has passed quality inspection in accordance with the law.

Source: National Law Information Center (www.law.go.kr, Forest and Mountain Villages Development Promotion Act, Enforcement Decree of the Act, Enforcement Rule of the Act)

6.3. Actors

Policies related to WSG are established and implemented by the interaction and participation of actors including the KFS as a central forest administration as well as local governments. The KFS plays a key role in establishing and implementing WSG policies through a combination of policy instruments such as law enactment and budget allocation. The Bureau of Forest Industry Policy of KFS takes charge of NTFP policies to improve forest

income. It plays a crucial role in managing the quality control system of WSG.

The KFS and local government are core organisations in implementing policies related to WSG. They closely cooperate with each other in supporting the cultivation of WSG through budget allocation. Local governments implement forest businesses funded by the KFS, and some invest in the WSG industry, such as Hongcheon, Pyeongchang, and Hamyang County, designated special zones for WSG industry development supported by the central government, Ministry of SMEs and Startups. They have established local ordinances for managing special zones and conducting activities such as promotion events, training programs, and research with support from the national government and private sector.

According to the Forest and Mountain Villages Development Promotion Act, Kofpi was established in 2012 as a public agent for revitalising the forest industry. Specifically, it is committed to the vitalisation and dissemination of forestry science and technologies and to increase the income of mountain villages by ensuring that forestry businesses increase the value of the forest product industry. It performs a very active role in promoting the growth of small forestry businesses and small and

medium-sized timber companies, creating value-added forest products and wood products, establishing an effective forest utilisation system, and strengthening the base for management innovation. Kofpi participates in implementing the WSG policy by conducting planning, advertising, implementing the first and second assessments after local government assessment, evaluating project feasibility, conducting site inspections, deliberating and selectiing public government contest programs, and providing technical training to those who cultivate or want to cultivate WSG.[1]

The Forest Product Quality Control Association (FPQCA) was established in 2010 to professionally perform quality control including the inspection and confirmation of the production and distribution of special forest products, and conduct of related education and training according to 'the Forest and Mountain Villages Development Promotion Act' (Article 18-9). With its establishment, Kofpi inherited all property as well as rights and obligations of the FPQCA (Addenda<Act No. 10949>, 2011). The FPQCA was supported by the national or local government, but was meant to operate from its own budget, which consisted of the membership fee, business income, and quality inspection fee

[1] Kofpi homepage: https://www.kofpi.or.kr/index.do

(Article 18-9, 18-10). Unlike FPQCA, Kofpi is a governmental organisation. This means the government controls the quality management system for WSG. Kofpi is in charge of most processes in the WSG quality management system. It conducts the production feasibility examination including the site inspection before the cultivation stage, production process management during the production stage, quality inspection at the harvest stage, and distribution management including monitoring of the labels and packaging with the cooperation of the police and local government in the distribution and sales stage (Chapter 3, Forest and Mountain Villages Development Promotion Act). It actively performs its tasks based on its expertise, administration capacity, and facilities. Police and local government cooperation is needed to control the trade of WSG because Kofpi does not have the authority to investigate and penalise violations, and do not have enough human resources to control the system on their own.

Government organisations and local governments have commissioned research on various aspects of WSG and its industrial development. Research institutions such as academic societies, universities, and other governmental research institutes have conducted research and provided evidence for policy recommendations.

The National Forestry Cooperative Federation (NFCF) was established in 1949 as a representative body of forestry cooperatives. After unification with the Forestry Federation of Korea and the Forestry Association in 1962 by the Forest Act, it became a well-structured organisation covering every kind of forest cooperative in the ROK. As a representative organisation of all forest owners and foresters in the ROK, NFCF has played an essential role in national reforestation businesses. In 1980, the Forest Cooperative Act was established, and the NFCF started being affected by independent acts in the Forest Act to promote sustainable forest management; improve forest productivity; and contribute to the balanced development of the national economy through improving the economic, social, and cultural status of cooperative members. The NFCF also provides a mutual financial service, which is a good channel to manage the loan part of forest policy businesses.[2] The NFCF does not have a direct role in the WSG industry. It manages loan businesses in the supporting fund for the cultivation of NTFPs (KFS 2013c). Qualified WSG cultivators who complete the education course specified by the KFS or who have prepared land for cultivation can apply to the 'Forest Income Business Support Program'

[2] National Forestry Cooperative Federation: http://www.nfcf.or.kr)

through the local government. The program offers subsidies, loans, and consulting services to selected applicant cultivators. The NFCF receives the loan application and executes the loan after an examination. It also functions as a consulting organisation for the practical management of WSG.

WSG cultivators participate in the policy procedure as a core stakeholder. In total, 2 993 forest households are registered as WSG cultivators. Gangwon-do Province has the largest number of cultivators (884), followed by Gyeongsangbuk-do Province (455) and Gyeongsangnam-do Province (369) (KFS 2020). The Korea Wild Simulated Ginseng Association (KWSGA), a WSG cultivator organisation, was established in 2009 to promote cultivation techniques for WSG, improve of quality management systems, construct common distribution channels, promote export and globalisation of WSG, and protect of rights and interests of its members (KFS, Press Release 2009). KWSGA plays a role in the development of exchange cultivation techniques, establishing quality standards and improving the distribution structure. However, their specific activities are hardly known to the public, except for some joint activities with other actors such as the KFS, local governments, and Kofpi. Finally, consumers are also

included as actors, sharing characteristics such as purchasing products and pursuing a high quality at a reasonable price.

Multiple stakeholders are related to the development of the WSG industry, including the KFS, local governments, Kofpi, research institutions, NFCF, KWSGA, and consumers. KFS, a government organisation, plays a primary role in establishing and implementing WSG policies. Depending on the Act, they control the quality of WSG during its cultivation and distribution. Local governments have established and implemented regional development plans focusing on WSG. Kofpi is respolsible for the quality management of WSG under the control of the KFS. NFCF has no visible role in the cultivation and trade of WSG; however, in principle, it can provide members who cultivate WSG with access to the loan program. The KWSGA represents cultivators in the process of communication with multiple stakeholders. However, cultivators' opinions are not effectively collected and shared with other stakeholders. The consumers play a relatively small role in policy implementation.

6.4. Resources/Power

Being in control of policy implementation, the KFS has the highest authority. It distributes this authority to each actor based on the Forest and Mountain Villages Development Promotion Act. The Act requires all cultivators to perform quality control tests in three steps before being sold. KFS established Kofpi as a new authority in the WSG quality management system. As such, Kofpi controls the illegal trade of WSG in collaboration with police agencies. The KFS exercises its strong regulatory power in establishing and implementing the quality management system of WSG.

KFS also allocates financial resources to the WSG industry (Table 7). The Forest and Mountain Villages Development Promotion Act provides a foundation for financial support for NTFPs including WSG, stipulating, ‘For the purpose of the structural improvement and promotion of forestry, the state and local governments may provide loans or subsidies for operators of the following projects to cover all or some expenses incurred in performing such projects.’, ‘3. Production, distribution, use, processing, or storage of forest products’ (Article 4). For example, the ‘Forest Income Support Program’ is for the short-term forest income products industry to alleviate problems pertaining to finance and infrastructure throughout the value chain.

The NFCF has funds raised by their members, the nationwide office network, and workforce to ensure the implementation of the subsidy policy.

TABLE 7 Budget allocation for wild simulated ginseng under Korea Forest Service management (based on the confirmed original budget)

(unit: thousand USD (1 USD ≒ 1 200 KRW), %)

Budget allocated only for WSG under KFS management					
Year	Related KFS Budget Total [A]	Total Budget of concerned department in KFS (Forest Industry & Policy Bureau) [B]	Total budget allocated only for WSG [C]	Percentage of [C] in [A]	Percentage of [C] in [B]
2018	2,003,749	550,764	4,761	0.23	0.86
2019	1,911,204	537,248	4,250	0.22	0.79
2020	2,072,872	567,715	5,601	0.27	0.98

Source: Confirmed Annual Budget (KFS, each year, www.forest.go.kr)

To provide qualified WSG seeds and seedlings, KFS began constructing a WSG seed management office in Chungju City in 2018. Furthermore, it has operated three seed harvest complexes in Chungju City (from 2017), Pyeongchang County (from 2017), and Hamyang County (from 2018). However, the seed

management office needs more time to be completed, and the seed harvest complexes cannot provide qualified seeds and seedlings yet. At present, there is no government support related to the provision of qualified seeds and seedlings, and WSG cultivators must on their own find a way to obtain seeds or seedlings good enough to pass the government's inspection and strict qualification standards.

A subsidy for WSG cultivators is supported by the government's special account for improving agricultural structure since 2013 (KFS 2013c). This subsidy supports fees for the examination of production feasibility and quality inspection, providing approximately USD 165 no more than twice per person/year. In this case, 40% of the total budget is from the national government, and 60% from the local government. This is one example of the abovementioned close relationship between the national and local governments. There are also joint projects among the actors. The Pyeongchang WSG Special Zone is one such example. Referring to the Regional Special Zone Operation Report of Pyeongchang County (2020), about USD 4 million of the national government fund is combined with about USD 4 million of the local government fund and about USD 17 million of the private fund to establish and operate the WSG Special Zone in Pyeongchang County. Experts and administrative support

are to be provided by the governments. The local governments operating special zones for the WSG industry allocate their budget to the establishment and management of special zones. Including Pyeongchang County, Hamyang County and Hongcheon County also run a budget of approximately USD 62.2 million and USD 7 million, respectively for their special zones. The budget consists of a combination of funds from the national government, local government, and private entities (Hamyang County 2020, Hongcheon County 2020).

Another major resource is the capacity afforded through expertise. The main fields of each actor and the required authority for conducting their roles are assigned according to the act and sub-rules. Kofpi has experts on education and quality management as well as the facilities required for them. There are 24 officers in the Department for Quality Management of Clean Forest Products who mainly deal with quality management. Two officers monitor illegal distribution. In the Department of WSG Seed Management, six officers work for businesses related to the WSG seed office and WSG specialised industry.

According to the Forest and Mountain Village Development Promotion Act, Kofpi shall conduct quality inspections and monitor cultivation and trade activities. However, Kofpi has limited resources to implement all quality management

procedures. For example, it is authorised to conduct product inspections by Articles 18-7 of the act regulating that the minister of the KFS may request a special institution or local government to collect products on the market for inspection and examination to monitor completion of the quality management process. The number of illegal distribution cases of WSG increased from 49 cases in 2013 to 200 cases in 2017, an increase of 300% over five years (Kofpi 2018)[3]. From 2012 to 2018, Kofpi conducted 705 product inspections. As mentioned, only two officers conducted these product inspections.

The local government has direct authority over their municipality with an autonomous organisation rights, autonomous administrative competence, self-legislative power, and autonomous finance rights. In addition to financial support, local governments also invest their administration in the development of the WSG industry. For example, Hamyang County is operating a special department just for the WSG industry special zone, namely the 'Department of Wild Ginseng Expo' which has five officers. In 2020, USD 7.6 million was allocated to the tasks for this division. Its main tasks are to construct the foundation of WSG industry, WSG quality management, increase income from the WSG

[3] www.newsis.com/view/?id=NISX20181015_0000443117&cID=10807&pID=10800, 26 October 2020

industry, manage the anti-aging industry, and construct the foundation of the WSG expo.

Kofpi also plays a major role in education and training (Table 8). It has four education centres nationwide that provide customised education training services for beginners in the forestry industry and for well-established people who want to improve their cultivation techniques through field experience considering the annual growth cycle of tree fruits, wild vegetables, and wild ginseng. It has implemented education programs such as the ‘wild simulated ginseng cultivation technical course’, ‘wild simulated ginseng and wild medical herbs and greens course for CEOs’, ‘WSG cultivation manager course’, and ‘technical course for cultivating wild simulated ginseng and wild medical herbs and greens’. These courses have a duration of 25 to 80 hours over four days to eight months, and participants pay the fees with financial support from the government. The Forest Training Institute of the KFS also provides WSG training programs at the national level. The training programs are mainly for government employees, but other interested people can participate (totalling less than 30% of the total number of trainees). Other online and offline education programs on WSG with regular and occasional schedules are also available to

support the management of WSG cultivation. The programs are organised by various local government institutes, scientific institutes, cooperatives, and associations. They are usually open to interested people with occasional and short-term schedules, especially the offline programs.

TABLE 8 Regular education programs on wild simulated ginseng at the national level

Organisation	Title of education program	Target
Korea Forestry Promotion Institution	WSG cultivation technical course	· Promotion of cultivation techniques and expert knowledge · Training professional foresters in their cultivation ability
	WSG and wild medical herbs and greens course for CEOs	· Training leading foresters · Invigoration of the senary forest Industry · Creating the social value of the forest field
	WSG cultivation manager course	· Promotion of income and competitiveness of the forest industry through training professional foresters · Advancement of WSG cultivation techniques and quality management · Pioneering of the new market through networking
	Technical cultivation course for WSG and wild medical herbs and greens	· Promotion of cultivation techniques and expert knowledge · Training professional foresters in their cultivation ability

Forest Training Institute of the Korea Forest Service	WSG cultivation course	· Promotion of cultivation techniques and expert knowledge
	Cultivation course for wild medical herbs and greens	· Promotion of cultivation techniques and expert knowledge

It can be noticed that the major budget and authority for the implementation of the policy on WSG industry development are originated from the government and was primarily allocated to governmental organisations. Furthermore, the budget is not sufficient for practical and effective policy implementation, especially in terms of the quality management process.

7. DISCUSSION

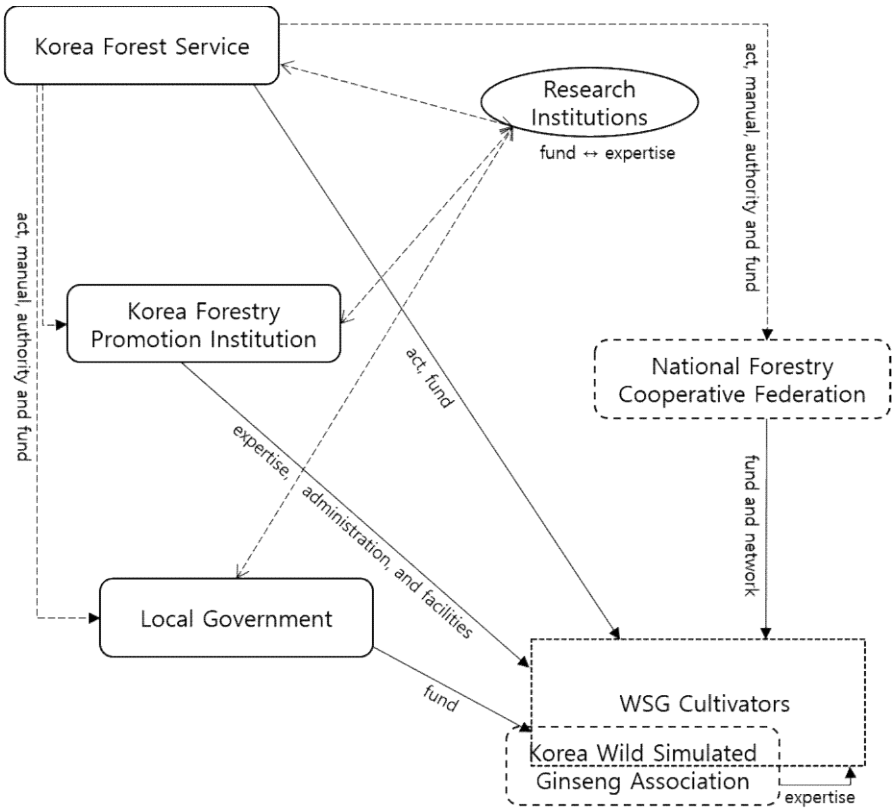
This study analysed the changes in policies focusing on the WSG industry using the PAA. The discourse on forest development revealed in the National Forest Plan has changed from timber-focused restoration and economic development approaches to human benefit-focused sustainable development, which affects the dimensions of the rules of the game and actors related to the WSG industry. In the process of change, interest in NTFPs emerged as a means of promoting the income of forest livelihoods. In this discourse, interest in WSG as a high-income

forest product has grown. As a central administration in charge of forestry, the KFS played a dominant role in fostering the WSG industry. The 3rd National Forest Plan highlighted forest resource management and strongly supported policies for the development of the NTFP industry. At the end of the 3rd National Forest Plan period in 1997, the backbone of regulations for WSG industry development and quality management was established under the title 'Forestry and Mountain Villages Development Promotion Act'. Reflecting policy discourse with a focus on high-income forest products, Kofpi as a key actor in the development of the WSG industry was established in 2012 according to the amended Act, which includes new articles stipulating its specific responsibility in 2011. Kofpi plays the main role in controlling the quality of WSG with its resources in expertise, administration, and facility and provides cultivators with education services as an institute equipped with professional human and physical resources. Education and research are related to production skills, quality management, and business management, including product processes, domestic sales, and exports. Local government provides subsidies for cultivation and quality management procedures. The NFCF provides loan services using its funds and nationwide networks, and KWSGA provides education services based on its

expertise. Figure 3 shows these relationships. The NFCF and KWSGA are represented by the dotted line because the NFCF does not provide a loan as one to support the cultivation of WSG, but as a loan supporting NTFPs. Furthermore, KWSGA's activities are hardly found in the related media.

Local governments such as Hongcheon County, Pyeongchang County, and Hamyang County, actively follow the WSG industry policy by the KFS and implement regional policies for WSG industry development as a regional development strategy. Based on the Acts, local governments have established ordinances and cooperated with other government ministries such as the Ministry of SMEs and Startups to establish and operate special development zones to enhance the local WSG industry. The zones were designated by combining financial investment from the local government, national government, and private organisations. The limitations of financial and human resources render it difficult for local governments to implement creative policies (Park and Youn 2013). The case of special development zones focusing on WSG is a good model of multi-stakeholder cooperation in fostering regional industry processes.

FIGURE 3 Flow of primary resources between actors in wild simulated ginseng cultivation policy



Note: ——→ directly related to WSG cultivators

- - - - → in-directly related to WSG cultivators

The WSG quality management system is operated according to the Forestry and Mountain Villages Development Promotion Act (Figure 4). The Act specifies a production regulation system to control the quality of WSG. The Act

regulates the overall roles of the KFS, Kofpi, and cultivators. It provides KFS regulatory policy power in controlling the WSG industry through the investigation of productive stability, verification of production processes, and quality inspections. According to the Act, the KFS provides cultivators with financial support including subsidies. Recently, it has been trying to offer high-quality WSG seeds through establishing and managing seeding complexes, but it does not effectively support cultivators yet. This financing and material will partially help cultivators meet the requirements of the WSG quality management system. In the value chain of the WSG industry, no actors play a prominent role in the distribution and sales of WSG, and no system is in place for the distribution and marketing of WSG. The NFCF can potentially assume this role based on its expertise and experience in forestry.

The quality certification system is regarded as a good quality management system considering the government's indirect regulatory role in the market when consumers' willingness to pay is higher than the current price. Choi *et al.* (2020) state that since the overall social benefits increase from a long-term perspective when both the consumer and producer's benefits increase, the government must support producers to minimise their

expenses for the administrative procedure of the certification and production costs. A small production fee will increase the demand for consumption, resulting in an increase of consumer's benefit and the producer's benefit (Choi *et al.* 2020). For the WSG quality management system, the cultivator bears the burden of a strict quality management system including the preparation of high-quality seeds and seedlings. The government's support to minimise WSG cultivators' costs and production efforts should be considered in terms of increasing the overall social benefit.

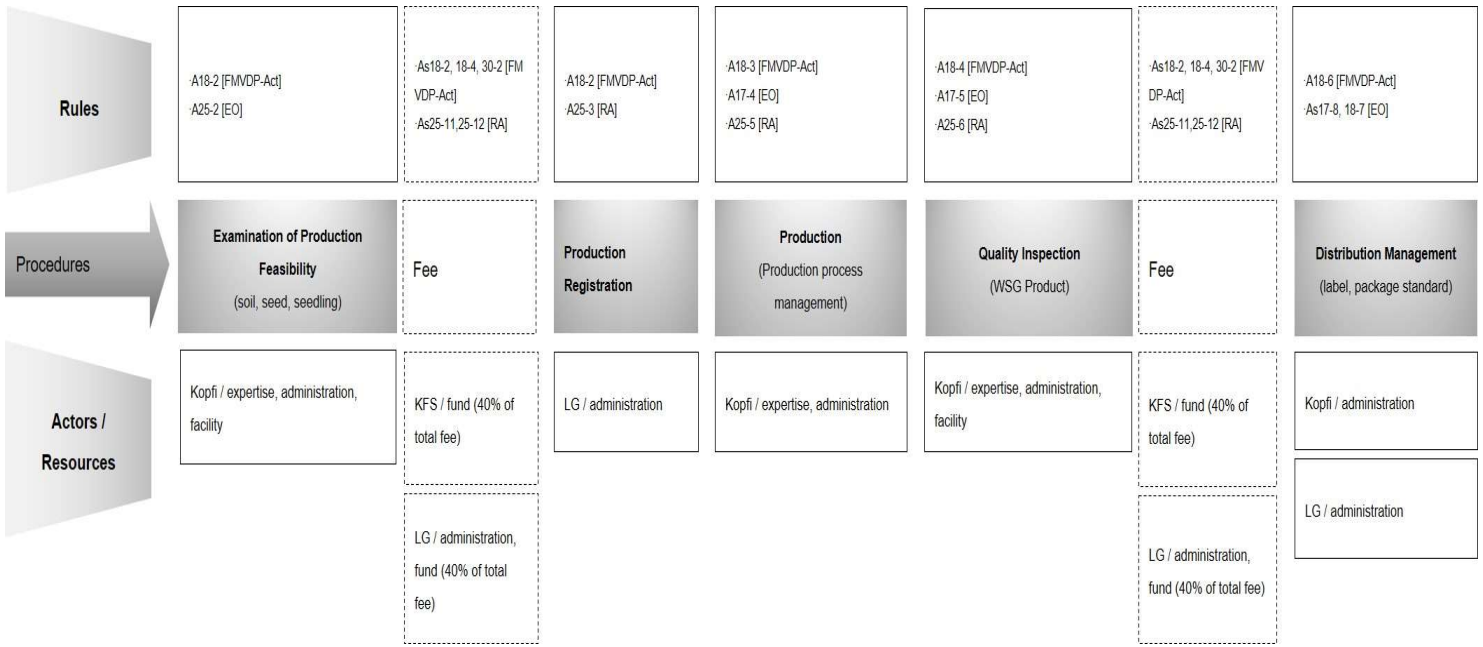
WSG is the only product requiring all cultivators to mandatorily abide by the quality management system regulated by the Act. The government engages in planning for the quality management of WSG, and the system is implemented mainly by government organisations according to the Act. The percentage of nationally accredited agricultural products at the consumer purchasing level is 16.5% for environmental-friendly agricultural products, 2.14% for protected geographical indications, 1.57% for good agricultural products, and 0.13% for agricultural traceability (Park *et al.* 2015). These are voluntary certifications for product differentiation, which elicits a producer's participation in ensuring added value.

In the case of organic farming in Germany, farmers who

consider the added value of organic products started establishing clubs (Gabriele *et al.* 2005). Club members established their own regulations for quality assurance, and shared techniques and required machinery between members. The clubs later developed into associations, and the system was improved with a government subsidy. However, the system also faced some challenges as the number of club members increased, and the German organic certification was implemented. The government was involved in establishing standards according to EU regulations and the necessary monitoring. The other part is controlled by certification companies in the private sector.

WSG quality management is a mandatory system overseen by strong regulations. OECD member countries are trying to change the regulatory quality management system to ensure effective and low-cost regulatory or non-regulatory methods. These focus on the regulation system itself, and consider regulatory inflation, high costs, and integration (Kim and Kim 2006). The discourse on WSG industry development focuses on improving the livelihoods of mountain village households through providing value-added, clean, and healthy products to consumers. It is time to think of the adequacy of WSG quality management regulation and how to balance this regulation with support for cultivators.

FIGURE 4 Quality management procedure of wild simulated ginseng and related rules, actors, and resources



Note: FMVDP-Act - Forest and Mountain Villages Development Promotion Act, EO - Enforcement Ordinance of the FMVDP-Act, RA - Regulation of the FMVDP-Act, Kofpi - Korea Forestry Promotion Institute, KFS - Korea Forest Service, LG - Local Government, A - Article

8. CONCLUSION

This study examined whether the WSG industry supporting policy in the ROK was implemented based on the close interconnectedness of four dimensions: discourse, actors, rules of the game, and resources. It was verified that the policy supporting the WSG industry in ROK was led by the central government in the way of command-control management and implemented through the systematic relationship between actors in the national and local government, governmental organisations, and cultivators. Their interactions were related to administrative power, funding, education, and training based on the Forest and Mountain Villages Development Promotion Act under the policy discourse to increase forest income, as indicated in the National Forest Plans. This study provided a comprehensive view of the dynamic procedure of policy implementation with practical example cases for the WSG industry as part of the NTFP industry. This study might serve as a reference for policy formulation focused on the development of the WSG industry and improvement of the NTFP industry.

The relationships between multiple stakeholders, flow of their resources, and regulations for policy establishment and

implementation mentioned in the study have some weaknesses. In particular, a lack of resources was detected in the distribution and sales process of the quality management system. More resources and systems should be allocated for controlling quality management, such as the provision of qualified WSG seeds or seedlings and the distribution and monitoring system. Special forest products need not only special regulations but also special supports.

This study has three main limitations. First, the discourse was analyzed only by the National Forest Plan. The reason was that there were no enough media materials found in the early period of the Plan implementation from 1973, and the Korean forest policy was led by a forest planning system in which the National Forest Plan was established as a master plan without effective public participation until the beginning of the 5th Plan (Bae et al. 2004). Second, it was difficult to analyse the in-depth relationships between actors based on interviews because of problems pertaining to funding and time. Third, this study analysed only a special forest product, and did not compare to other NTFPs. It will be helpful if further research conducts a deep analysis covering the effect of public participation in the establishment and implementation of the policy, analyses in-depth

relationships and interactions between actors based on interviews, and compares these with other NTFPs.

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※ 국문요약(국문초록)

요약(국문초록)

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비목재임산물은 임가 소득 증대와 소득 수단 다양화에 기여한다. 비목재임산물인 산양삼은 고소득 작물이면서 건강한 먹거리로서 한국사회에서 주목받고 있다. 정부는 산양삼 산업 지원 정책을 수립하여 시행하고 있다. 본 연구는 국내 산양삼 산업 정책 변화를 분석하였다. 정책분석 방법인 Policy Arrangement 기법을 활용하여 정책의 네 가지 차원을 분석하였다; 1)산양삼 관련 정책 담론, 2)산양삼 생산 및 판매에 관한 규칙, 3)이해관계자의 참여와 협력, 4)이해관계자가 보유한 자원이나 권력. 본 연구에서는 비목재임산물 및 산양삼 관련 담론과 규칙의 변화, 이해관계자 간 협력 및 갈등 관계, 산양삼 품질관리 규정 시행 과정에서의 자원 분포와 권력 관계를 증명하였다. 산양삼 산업 정책의 네 가지 차원을 분석한 결과, 임가 소득 증대를 강조하는 산양삼 정책 담론에 따라 산양삼 품질관리에 관한 새로운 규정이 수립되고, 규정에 따라 제한적인 재배

활동과 지역 발전을 위한 투자 활동을 확인하였다. 산양삼 품질관리 제도는 정부 주도의 규제정책 중심으로 실행되면서 산양삼 생산 및 판매 활동에 대한 경제적 인센티브나 컨설팅과 같은 지원 정책은 활발히 추진되지 않았다. 따라서 본 연구는 담론, 규칙, 이해관계자, 자원 및 권력의 상호 작용 분석을 통해 정부 주도 규제 중심 산양삼 산업 정책의 변화를 증명함으로써 산양삼 산업 정책 형성과 실행의 역동적인 절차에 대한 종합적인 이해를 돕는다. 이는 비목재임산물 산업화 정책 형성에 기여할 수 있을 것이다.

주요어 : 비목재임산물, 산양삼, 품질관리, 정책분석, 한국

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