

[The 8th Conference of East Asia Research Association for Agricultural Heritage Systems]

Factors Influencing Participation in Agricultural Heritage Conservation Activities

: Case Study of Uiseong Traditional Irrigation Agriculture System

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Contents

01 Background

02 Research Overview

03 Result

04 Conclusion

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Background



01 Uiseong Agricultural Heritage

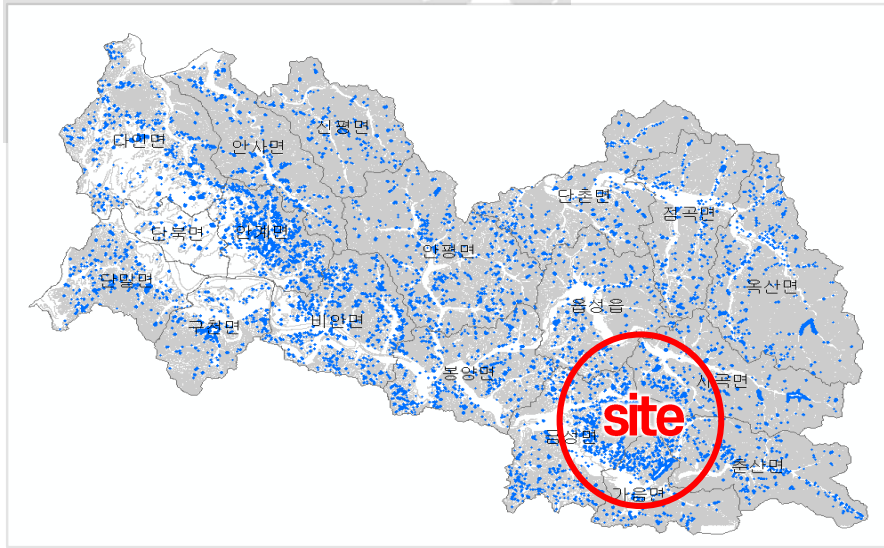


Uiseong Traditional Irrigation Agricultural System

National Important Agricultural Heritage(2018)

World Heritage Irrigation Structures(2022)

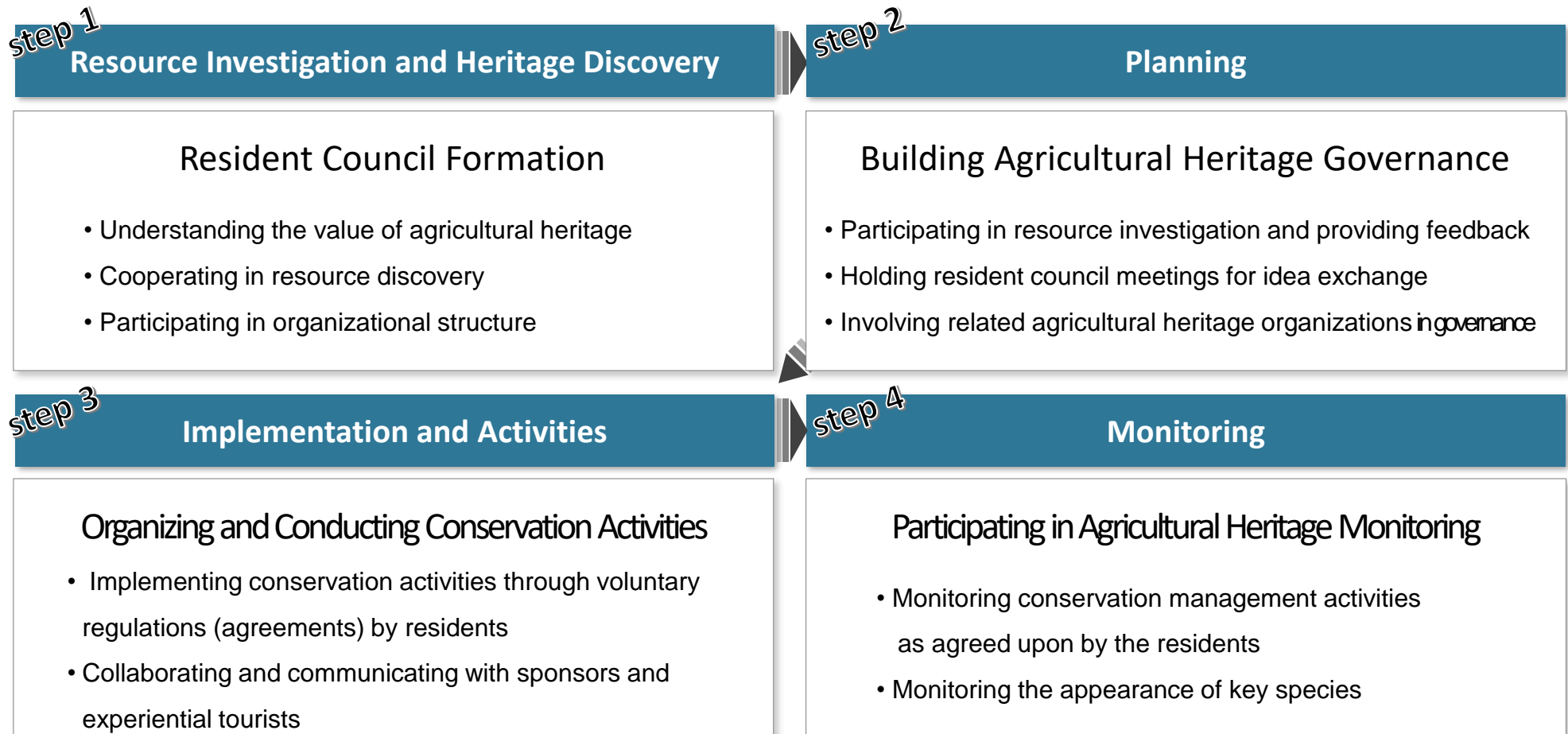
Water storage facilities were constructed in the Uiseong region, and water was divided and kept in the shape of a pond or small reservoir at various locations for agricultural use. A total of 6,227 ponds (small reservoirs) have been developed over centuries. Particularly, around one thousand small reservoirs provide water to agricultural areas in the Mount Geumseong region.



02 Resident Participation

“ Encouraging Voluntary Resident Participation from the Agricultural Heritage Discovery Phase ”

Step-by-Step Resident Participation



02 Resident Participation

“ Various Resident-Led Conservation and Management Activities for Uiseong County Agricultural Heritage Preservation ”

Operating Irrigation Association Meetings and Maintaining Irrigation Facilities

- Reporting on the settlement of irrigation association accounts and annual operation plans



Holding the Unkok-ri Pond general meeting

First Water Release Ceremony for a Bountiful Harvest

- Performing a ritual by the village shaman before planting rice after harvesting Hanji garlic



Holding the first water release ceremony

Village Cleanup Activities

- Removing harmful plants and picking up trash as part of environmental improvement activities



Picking up trash



Maintaining the Unkok-ri agricultural water channels



Performing a ritual for a bountiful harvest



Removing harmful plants

03 Education Programs

“ Continuous education programs for residents are conducted to encourage participation in conservation activities. ”



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II Research Overview



“ To ensure the sustainable conservation and management of agricultural heritage, it is essential to find ways to increase the participation of local residents. ”

Importance of Resident Participation

- Global Attention to Multifunctionality of Agriculture:
 - Since the 1980s, countries around the world have been focusing on the multifunctional roles of agriculture (Cahill, 2001).
- Need for Agricultural Heritage Conservation in South Korea:
 - The necessity of preserving agricultural heritage resources in South Korean rural areas has been raised.
 - Since modernization, many traditional agricultural cultural heritages that should be preserved have been significantly damaged due to uniform, development-focused rural development policies that did not consider the unique characteristics of the regions (Yoon, 2014).

Need for Research on Sustainable Conservation and Management of Nationally Important Agricultural Heritage

- Essential Role of Resident Participation:
 - For the sustainable conservation and management of nationally important agricultural heritage, the participation of local residents is crucial.
- Developing Strategies to Enhance Resident Participation:
 - It is necessary to develop strategies to increase the involvement of local residents in the conservation and management activities of nationally important agricultural heritage areas.

“

Community-based conservation (CBC) has proven effectiveness and benefits through theoretical and empirical research.

→ Needs to be recognized as an important component of modern conservation strategy

”

Theory of community-based conservation (CBC)

CBC is an approach to protecting natural resources and ecosystems through citizen participation and initiative.

[Theoretical background]

- Common-Pool Resources Theory (CPRT)
 - Elinor Ostrom believes that the sustainable management of common resources is critical for regional Claims to be enabled by the voluntary cooperation of the community and adherence to rules
- Participatory Approaches:
 - It's important for residents to be involved in the decision-making process and leverage their knowledge and experience
 - Important because citizen engagement makes policies more feasible and effective

[key papers and research findings]

- Western, D., & Wright, R. M. (1994). "Natural Connections: Perspectives in Community-based Conservation":
 - Success stories from resident-led conservation efforts have shown that resident-led conservation efforts can be a great way to help
 - Can be more sustainable and effective than conservation efforts led by external organizations
- Agrawal, A., & Gibson, C. C. (1999). "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation":
 - To be successful, resident-led conservation efforts must emphasize the dynamism and diversity of local communities.
 - Claims that social capital and trust among residents is important
- Berkes, F. (2004). "Rethinking Community-Based Conservation"
 - Emphasize that successful CBCs require external support and collaboration, as well as the involvement of local residents

“ Factors that influence community-led conservation can be categorized into social, economic, cultural, institutional, and individual. ”

Factors that influence community-based conservation

Social Factors – McMillan, D. W., & Chavis, D. M. (1986); Goudy, W. J. (1990); Hungerford, H. R., & Volk, T. L. (1990)

- **Sense of Community:** According to **sense of community** theory, a strong sense of community promotes mutual support and cooperation within a community.
- **Social Capital:** Putnam's theory of social capital argues that social networks, trust, and norms are important influences on cooperative behavior in a community.
- **Environmental Awareness:** Environmental education and awareness drives residents to understand and engage with the importance of environmental issues.

Economic Factors – Ferraro, P. J., & Kiss, A. (2002); Wunder, S. (2007); Chambers, R., & Conway, G. (1992)

- **Economic Incentives:** Economic incentives are one of the main factors that determine people's behavior. Engaging residents in conservation activities
- **Livelihood Security:** People are more likely to engage in conservation activities when they have no difficulty making ends meet.

Cultural Factors – Milton, K. (1996) – Berkes, F., Colding, J., & Folke, C. (2000); Gadgil, M., Berkes, F., & Folke, C. (1993)

- **Traditional Knowledge:** Traditional ecological knowledge is knowledge that has been accumulated over a long period of time and plays an important role in resource management and conservation activities.
- **Cultural Values:** Cultural values and beliefs about nature and the environment have a significant impact on the behavior and attitudes of residents.

Institutional Factors – Kothari, A., Camill, P., & Brown, J. (2013); Ostrom, E. (1990); Agrawal, A., & Ostrom, E. (2001)

- **Policy Support:** Government policy support and legislation play an important role in the success of conservation efforts. Policy support encourages people to participate
- **Co-management Arrangements:** a way of managing resources through collaboration between governments and local people

Individual Factors – Stern, P. C., & Dietz, T. (1994); Dunlap, R. E., & Van Liere, K. D. (1978); Berkes, F. (2009)

- **Personal Environmental Values:** Values and beliefs strongly influence their behavior
- **Local Leadership:** Influential leaders in the community play an important role in mobilizing and engaging residents.

Research methods

[Data Collection] Survey

- Conducting interviews with local residents to gather fundamental data
- Administering surveys

[Analytical Methods]

- Utilizing a binary logistic regression model to analyze factors influencing participation in agricultural heritage conservation and management activities
- Investigating the annual hours residents are willing to participate in activities based on their willingness to participate
- Exploring reasons for difficulty in participation
- Assessing satisfaction with the proposed payment criteria (10,000 KRW per hour per person) and determining the acceptable payment amount

[Drawing Conclusions]

- Synthesizing significant factors from the analysis and survey results to present comprehensive conclusions

Survey overview

- Survey Period: April 1, 2020 - May 13, 2020
- Survey Scope: Residents in the registered area of Uiseong Traditional Irrigation Agricultural System, Nationally Important Agricultural Heritage No. 10
- Surveyed 353 households in 23 villages across 3 towns in Uiseong County, Gyeongbuk Province
- Survey Content: Understanding residents' willingness to participate in agricultural heritage preservation and management activities, and the minimum acceptable payment for participation
- Survey Method: On-site visits and face-to-face surveys in each village

Survey questions

What we found

<p>Agricultural Heritage Conservation and management activities</p>	<ul style="list-style-type: none"> • Interest in agricultural and ecological conservation • Experience participating in agricultural and ecological conservation activities • Knowledge of Agricultural Heritage of National Importance No. 10 • Whether the farm is connected to a nationally significant agricultural heritage site 	<ul style="list-style-type: none"> • Intention to participate in nationally important agricultural heritage conservation and management activities • Annual hours of participation in nationally important agricultural heritage conservation and management activities • Satisfaction with the amount of compensation for conservation and management activities for agricultural heritage of national importance 	
<p>Basic demographics</p>	<ul style="list-style-type: none"> • Gender • Age • Education Level 	<ul style="list-style-type: none"> • Major Crops • Educational hours related to agricultural heritage and agroecology 	<ul style="list-style-type: none"> • Average annual farm income • Agriculture Career • Farm Size

04 Survey Description

		Frequency (people)	Composition ratio (%)	Minimum	Maximum	Average	Standard deviation
Gender	Subtotal	353	100.0				
	male	267	75.6				
	female	86	24.4				
Age	Subtotal	353	100.0	35	89	64.8	10.121
Farming experience (years)	Subtotal	353	100.0	1	75	31.9	17.751

		Frequency (people)	Composition ratio (%)
Main Crops (Duplicate response)	Subtotal	353	100.0
	Rice	208	
	Garlic	205	
	Peach	113	
	Chili	43	
	Other	53	Plums 37, apples 8, peas 5, grapes 3
Education	Subtotal	353	100.0
	Beginner	77	21.8
	College graduate	95	26.9
	High School Diploma	141	39.9
	College Graduate	37	10.5
	Graduate	3	0.8

		Frequency (people)	Composition ratio (%)
Annualized Agricultural Assistance Revenue (10,000KRW)	Subtotal	353	100.0
	Less than 3,000	179	50.7
	Less than 3-6 thousand	99	28.0
	Less than 6-9 thousand	48	13.6
	Less than 9-12 thousand	22	6.2
	Less than 12-15 thousand	4	1.1
	15K or more	1	0.3

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III Result



- Willing to participate in the conservation and management of the Agricultural Heritage

	Number of responses (people)	Weight (%)
Subtotal	353	100
Willing to participate	283	80.2
Not willing to participate	70	19.8

- Why it's hard to engage 70 unwilling locals in conservation and management activities

	Number of responses (people)	Weight (%)
Subtotal	70	100
Labor shortages due to aging workforce	38	54.29
Lack of sense of community among villagers	4	5.71
Not interested	26	37.14
Insufficient funding	1	1.43
Other	1	1.43

01 Survey results

○ Hours of participation in conservation and management activities per year by 283 willing local residents

分类	Minimum	Maximum	Average	Standard deviation
Improving agricultural water quality (cleaning ponds, planting aquatic plants, etc.)	0	200	6.53	14.275
Agricultural rituals and community cultural transmission (Organizing a repair system, running a nail inspection system, etc.)	0	200	15.18	41.844
Maintaining and passing on traditional farming techniques (Demonstrations of traditional farming methods using water troughs and mud pots, etc.)	0	200	14.19	40.699
Preservation of traditional land use landscapes (agricultural and water maintenance, joint farming activities, etc.)	0	200	12.72	38.343
Utilizing and conserving traditional rainfed irrigation (Nail repair and restoration, canteens, nail bell making and repair, etc.)	0	200	5.81	15.254
Creating and managing dumbwaiters (ecological water pools)	0	100	4.78	12.462

01 Survey results

○ Amount of willingness of 283 local residents to participate in conservation and management activities

	Minimum	Maximum	Average	Standard deviation
Improving agricultural water quality (Cleaning reservoirs, planting aquatic plants, etc.)	9,000	40,000	13,625	5,935
Agricultural rituals and community cultural transmission (organizing a repair system, running a nail inspection system, etc.)	5,000	40,000	11,724	4,713
Maintaining and passing on traditional farming techniques (Demonstrations of traditional farming methods using water troughs and mud pots, etc.)	5,000	40,000	11,859	4,832
Preservation of traditional land use landscapes (agricultural and water maintenance, joint farming activities, etc.)	5,000	80,000	13,131	7,962
Utilizing and conserving traditional rainfed irrigation (Nail repair and restoration, canteens, nail bell making and repair, etc.)	9,000	50,000	12,883	7,108
Creating and managing dumbwaiters (ecological water pools)	9,000	40,000	12,346	5,382

02 Analysis results

Variables

Independent Variables	Data content	Minimum	Maximum	Average	Standard deviation
Agriculture and Ecological Conservation Activity participation	①Experienced (=1) ②Inexperienced (=0)	0	1	0.56	0.497
Nationally Significant Agricultural Heritage Knowledge of	①Not at all (=1) ②Don't know (=2) ③Somewhat (=3) ④I know (=4) ⑤I know very well (=5)	1	5	3.12	1.183
Utilizing traditional repair facilities Farmed or not	①Yes (=1) ②No (=0)	0	1	0.70	0.460
Gender	①Male (=1) ②Female (=0)	0	1	0.76	0.430
Farming experience	①10 years or less (=5) ②11-20 years (=15) ③21-30 years (=25) ④31-40 years (=35) ⑤51-60 years (=55) ⑥61+ years (=65)	5	65	29.65	17.171
Rice Field Size	Area	0.1	10.0	0.827	0.958
Education	Less than a high school diploma (=0), middle school and high school diploma (=1), college degree or higher (=2)	0	2	0.90	0.567
Average annual agricultural revenue	Less than 30 million won (=0) More than 30 million won (=1)	0	1	0.49	0.501

02 Analysis results

Results of binary logit model analysis

[Dependent variable: willingness to participate in conservation management activities]

Nagelkerke R² = 0.362

Independent variables	Estimation coefficients	Standard error	Probability of significance	Exp(β)
Participation in agricultural and ecological conservation activities	0.739	0.342	0.031 ** B	2.093
Knowledge of agricultural heritage of national significance	0.427	0.149	0.004 *** B	1.532
Farming using traditional repair facilities	1.194	0.332	0.000 *** B	3.301
Gender (male = 1)	0.744	0.364	0.041 ** B	2.104
Years of farming experience (age)	-0.019	0.011	0.083 * The	0.981
Rice Field Size	0.607	0.302	0.044 ** B	1.835
Education	0.584	0.352	0.097 * The	1.793
Average annual agricultural revenue	-0.341	0.352	0.332	0.711
Constants	-1.457	0.681	0.032	0.233

Notes: * significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level.

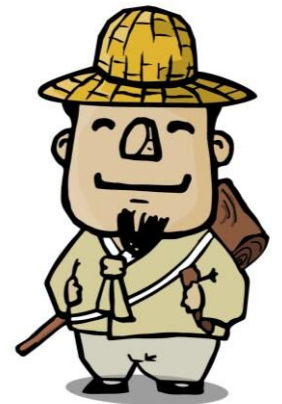
- Intention of local residents to participate in conservation and management activities of Agricultural Heritage : 80.2% of local residents are willing to participate in conservation management activities
- [283 local residents willing to participate]
Average annual hours of participation in conservation and management activities
 - : 6.5 hours for improving water quality for agricultural use and 15.2 hours for preserving agricultural rituals and community culture,
 - : 14.2 hours for maintenance and succession of traditional agricultural techniques and 12.7 hours for conservation of traditional land use landscapes
 - : Utilization and conservation of traditional rain-fed irrigation 5.8 hours; creation and management of dumbwaiters 4.8 hours
- Reasons why it is difficult for 70 local residents to participate in conservation and management activities
 - : Lack of labor due to aging population (54.29%) was the most common, followed by **lack of interest (37.14%)**

- Satisfaction with payment threshold for conservation and management activities
 - 78.6% of 353 local residents were satisfied with the payment thresholds
 - The minimum willingness to pay for conservation and management activities of 353 local residents averaged KRW 12,237 for 6 activities
 - 13,181 for improving water quality for agricultural use, 11,516 for preserving agricultural rituals and community culture, and 11,595 for maintaining and passing on traditional agricultural techniques
 - Conservation of traditional land use landscapes 12,671 KRW, Utilization and conservation of traditional drip irrigation 12,445 KRW, Creation and management of dumbbells 12,014 KRW

- Factors that influence people's willingness to participate in conservation and management activities
 - (+) Positive impact: knowledge level of nationally important agricultural heritage, farming using traditional repair facilities, Participation in agro-ecological conservation activities, gender, paddy field size, education level
 - (-) Negative influence: years of farming experience (age)

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IV Conclusion



[Resident Education] Systematic Education for Local Residents:

- Systematic education programs about nationally important agricultural heritage should be provided to local residents.

[Resident Support] Support for Resident Participation in Conservation Activities:

- Financial support for residents' participation in conservation and management activities is essential.
- Increasing knowledge about nationally important agricultural heritage among residents can significantly boost their willingness to participate in conservation efforts.

[Addressing Lack of Interest] Enhancing Resident Engagement:

- Considering that a significant portion of residents (37.14%) cited a lack of interest as a reason for not participating, targeted educational programs at the village level can help increase their engagement and participation.

[Sustainable Conservation and Management Support] Support Budget for Sustainable Conservation:

- Budgetary support for the sustainable conservation and management of nationally important agricultural heritage should be considered.
- Support for traditional agricultural activities is necessary to maintain these heritage practices.

02 Limitations and Future Plans

- **Positive Change in Resident Participation Expected:**

- Uiseong County has consistently conducted resident participation conservation activities and educational programs over the past three years, which is expected to result in a positive change in residents' willingness to participate.

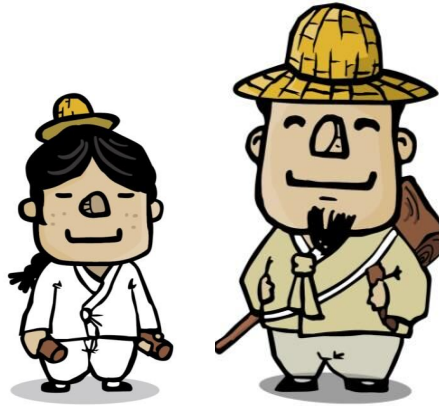
[Limitations of the Current Data]

- **Data Limitations:** The data used in this study are from a survey conducted three years ago, and there is a lack of recent information.

[Future Research Plans]

- **Comparative Studies Over Time and Across Regions:**

- Based on the results of this study, future research should include time-based and regional comparisons, as well as international comparisons (e.g., between South Korea, China, and Japan).
- **Time Comparison:** Conducting the same survey as in the past to understand differences between past and current periods.
- **Subject Comparison:** Considering comparative studies between different regions within the country or between countries (e.g., South Korea, China, Japan).



Thank you for listening.