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A Study on the Distribution Characteristics of NATURALIZED PLANTS: For Gyeongsangbuk-do Area

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Abstract

Purpose: *Naturalized plants come in artificially or naturally, producing and spreading large numbers of seeds. Naturalized plants are not culled in the natural ecosystem and coexist in their own way. They have a wide range of tolerance and fast growth rates. Therefore, this study analyzed the differences of naturalized plants in the Gyeongsangbuk-do area by population density, forestland ratio, farmland ratio, land ratio, road ratio, and river ratio. We investigated the correlation with the naturalization index to understand the distribution characteristics of naturalized plants.*

Method: *We conducted one-way ANOVA and multivariate analysis of variance(MANOVA) to determine the differences between the number of naturalized plant species and the items related to the naturalization index. Post-hoc analysis was performed through the Scheffe test method. We performed curvilinear regression analysis to find out the correlation. We used the Spss Statistics 21 statistics program to perform the above statistical analysis.*

Results: *The naturalization index of naturalized plants showed differences in four items: population density, farmland ratio, land ratio, and river ratio, but there were no statistical differences in the two items, such as forestland ratio and road ratio. The farmland ratio did not affect the increase or decrease in the naturalization index. When the land ratio and road ratio increased, the naturalization index was also positively correlated. The river ratio had a positive correlation, but it had a negative correlation again after a certain point.*

Conclusion: *The results of this study are expected to be used as data for selecting priority areas to manage naturalized plants. In addition, the data of this study can be used as basic data to study the naturalization index and environmental change of naturalized plants. However, we propose that comprehensive management for naturalized plants, such as analysis of the inflow path and distribution characteristics of naturalized plants between domestic regions, should be carried out continuously at the administrative level of local governments.*

[Keywords] ***Naturalized Plants, Naturalization Index, Emergence Rate, Distribution Characteristics, Correlation***

1. Introduction

Naturalized plants are almost one and two years old herbage and have a wide range of tolerance except for light conditions. In addition, they have characteristics such as fast growth rate, continuous and significant number of seeds production, short life span, and fast dispersion[1][2]. Therefore, naturalized plants are spreading to places where the natural environment is destroyed, centering on airports, ports, roadsides, ranches, parks, and tourist destina-

*This Paper Summarizes Byeonggu Yang's Daegu Haany University Master's Thesis.

tions. They spread around places exposed to direct sunlight, such as in and around cities, waysides, riversides, wastelands, agricultural lands, forest roads in the mountains, and mountain trails. In some cases, naturalized plants threaten the ecological niche of native species even in stable habitats[3].

In the study of naturalized plants, the term 'naturalized plants' was first used by Lee YN and Oh YJ(1974) after Lee DB and Kim YC(1961) introduced 65 species of plants native to the Americas[4][5][6]. Later, Lee WC and Lim YJ(1978) reported a list of 80 species of naturalized plants in a study on the distribution of vascular plants in the Korean Peninsula. Lim YJ and Jeon ES(1980) reported 110 species of naturalized plants by conducting a distribution survey on 200 sites in the country[7]. After that, Park SH et al(2002) reported 271 species through a domestic distribution study of naturalized plants. Lee YM et al(2011) reviewed the research literature reported to the domestic academies and reported 321 species[8]. In the same year, Ryu TB(2012) identified 619 species of naturalized plants introduced into Korea based on published documents. He classified 315 species as Neophyten and 14 species as Archeophyten among them. He also argued that 290 species should be excluded from the list of naturalized plants[9].

Jeong SY(2014) summarized 290 species of invasive alien plants(IAP), excluding species with uncertain distribution and species judged as native plants out of the 321 species compiled by Lee YM and others(2011)[10][11][12].

In particular, in the study of vascular plants, naturalized plants are being studied intensively. Research to analyze the characteristics of naturalized plants in a specific area and studies to analyze the ecological environment of specific naturalized plants are actively conducted [13][14]. In general, studies related to the distribution of naturalized plants deal with studies on the distribution status by region, year, and location type. Some studies on the distribution status by altitude, population density, and forestland ratio are also being conducted. In a study on the distribution of naturalized plants by region, Park SH et al(2002), Jeong SY(2014), and Lee HJ(2020) analyzed the total and average species number of naturalized plants in Korea. Lee HJ(2018) also analyzed the total and average species number of naturalized plants in the Gyeongsangbuk-do area[15][16]. In a study on the distribution of naturalized plants by year, Lee HJ(2018) analyzed the number of naturalized plant species by year identified by visiting 80 places in the Gyeongsangbuk-do for 8 years from 2010 to 2017[17]. Lee HJ(2020) analyzed the number of naturalized plant species by year, altitude, population density, forestland ratio based on 12 years of flora survey data from 2006 to 2017, which corresponds with the third to fourth national natural environment survey period.

This study investigated the distribution status of naturalized plant species distributed throughout the Gyeongsangbuk-do area.We aimed to determine the distribution characteristics of naturalized plants by analyzing the naturalization index's differences by items and the naturalization index's correlations by items.

2. Methods

2.1. Gathering data

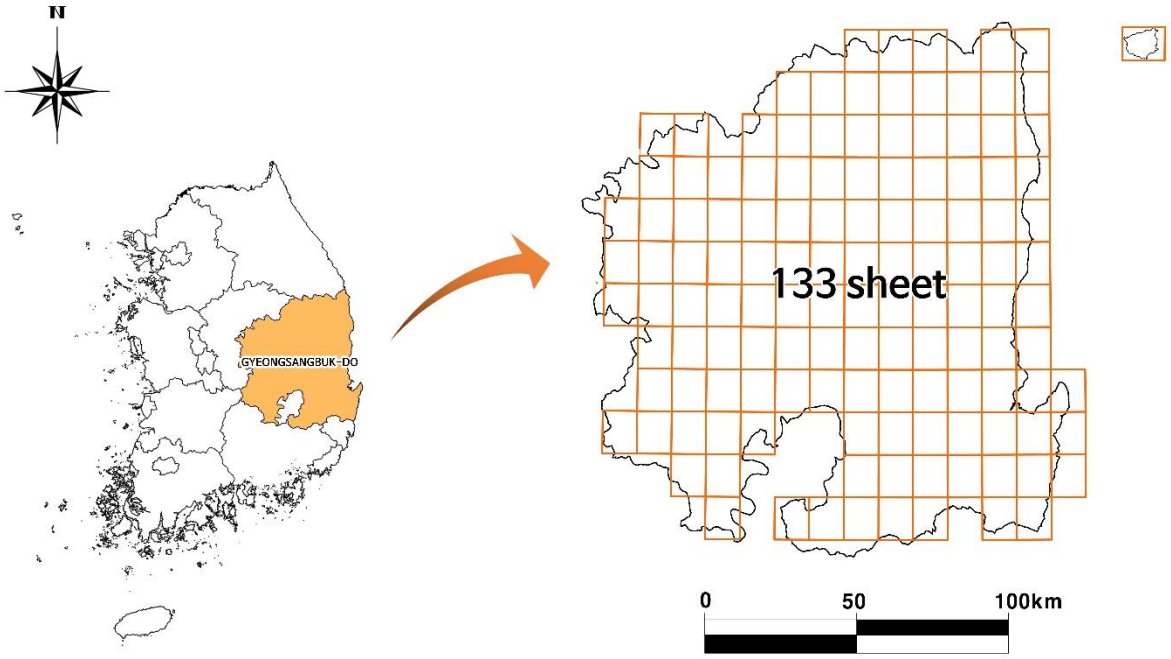
This study analyzed the distribution characteristics of naturalized plants based on the flora survey data for 12 years from 2006 to 2017 of the national natural environment survey in the Gyeongsangbuk-do region <Table 1>, <Figure 1>.

When looking at the survey sites by region, Bonghwa was the largest with 18 places(9.8%). There were 16 places in Uiseong(8.7%), 15 places in Uljin(8.2%), 13 places in Gyeongju(7.1%), 12 places(6.5%) in Gimcheon, and 12 places(6.5%) in Pohang. Gyeongsan, Gumi, and Ulleung each had 3 places(1.6%), and Goryeong had 2 places(1.1%), which had the least number of survey sites.

Table 1. Number and ratio of research target sites by region.

Area	Study sites		Sheet		Area	Study sites		Sheet	
	Number of study sites	Ratio (%)	Number of sheet	Ratio (%)		Number of study sites	Ratio (%)	Number of sheet	Ratio (%)
Gyeongsan	3	1.6	3	2.3	Yeong yang	5	2.7	4	3.0
Gyeongju	13	7.1	9	6.8	Yeongju	7	3.8	3	2.3
Goryeong	2	1.1	1	0.8	Yeong cheon	4	2.2	4	3.0
Gumi	3	1.6	3	2.3	Yecheon	7	3.8	5	3.8
Gunwi	5	2.7	4	3.0	Ulleung	3	1.6	1	0.8
Gimcheon	12	6.5	7	5.3	Uljin	15	8.2	9	6.8
Mun gyeong	10	5.4	7	5.3	Uiseong	16	8.7	9	6.8
Bonghwa	18	9.8	10	7.5	Cheongdo	9	4.9	4	3.0
Sangju	9	4.9	9	6.8	Cheong song	7	3.8	6	4.5
Seongju	5	2.7	4	3.0	Chilgok	4	2.2	4	3.0
Andong	8	4.3	8	6.0	Pohang	12	6.5	12	9.0
Yeong deok	7	3.8	7	5.3	Total	184	100.0	133	100.0

Figure 1. Mapping status of research sites.



Note: National geographic information institute, 1/25000 index, researcher rewriting.

2.2. Data analysis

This study is based on the flora survey data of 133 map numbers(184 places), the national natural environment survey data in the Gyeongsangbuk-do region.

We investigated whether there is a difference in the naturalization index by the six items: population density, forestland ratio, farmland ratio, land ratio, road ratio, and river ratio. We also tried to find out the distribution characteristics of naturalized plants by analyzing the correlation with the naturalization index by six items[18][19][20].

We performed One-way ANOVA and Multivariate Analysis of ANOVA(MANOVA) to determine the differences between the number of naturalized plant species and the items related to the naturalization index. Post-hoc tests were performed through the Scheffe test method. Curvilinear regression analysis was performed to find out the correlation. We used the Spss Statistics 21 statistics program to perform the above statistical analysis.

3. Results & Discussion

3.1. Distribution status difference analysis

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by population density. The results were F=3.466, p=0.009, showing differences in naturalization index by population density. According to the population density, the naturalization index was the highest at 8.38% in 601-700(persons/㎢). The analysis results were in the order of 7.53% in 401-500(person/㎢), 7.15% in 101-200(person/㎢), and 6.15% in 201-300(person/㎢). The result was the lowest at 5.88% in 1-100(persons/㎢). We found that the naturalization index by population density was mixed with increasing and decreasing.

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by forestland ratio.The analysis result was the highest at 7.29% in 51-60%.The results were 6.58% in 61-70%, 6.50% in 71-80%, and 5.58% in 81-90%. We analyzed that the higher the forestland ratio, the lower the naturalization index. However, confirming

the F value and the significance probability for the naturalization index was F=2.381, p=0.071, and there was no statistical difference.

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by farmland ratio. The results were F=2.726, p=0.015, showing differences in naturalization index by farmland ratio. According to the farmland ratio, the naturalization index was the highest at 7.02% in 16-20%.The analysis results were 6.36% in 26-30%, 6.14% in 11-15%, 5.73% in 21-25%, and the lowest was at 5.24% in 6-10%. We analyzed that the naturalization index by farmland ratio was mixed with increasing and decreasing.

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by land ratio. The results were F=3.838, p=0.001, showing differences in naturalization index by land ratio. According to the land ratio, the naturalization index was the highest at 8.74% in 4.1-4.5%.The analysis results were 8.02% in 3.6-4.0%, 7.53% in 3.1-3.5%, 7.32% in 1.1-1.5%, 6.38% in 1.6-2.0%, and the lowest was at 4.84% in 2.6-3.0%.We analyzed that the naturalization index by land ratio was mixed with increasing and decreasing.

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by road ratio.According to the road ratio, the naturalization index was the highest at 8.74% in 3.6-4.0%. The analysis results were 6.86% in 3.1-3.5%, 6.60% in 2.6-3.0%, 6.20% in 2.1-2.5%, 6.16% in 1.6-2.0%, and 6.03% in 1.1-1.5%. We analyzed that the lower the road ratio, the lower the naturalization index. However, there was no statistical difference between the F value and the significance probability as F=0.829, p=0.531.

We conducted a one-way ANOVA analysis to determine whether there is a difference in the naturalization index by river ratio. The results were F=2.797, p=0.006, showing differences in naturalization index by river ratio. According to the river ratio, the naturalization index was the highest at 7.19% in 5.1-6.0%.The analysis results were 6.88% in 4.1-5.0% and 6.1-7.0%, respectively, 6.36% in 8.1-9.0%, 6.12% in 9.1-10.0%, and the lowest was at 4.84% in 7.1-8.0%. We analyzed that the naturalization index by river ratio was mixed with increasing and decreasing.

3.2. Correlation analysis

The results of the correlation analysis between the naturalization Index and population density of naturalized plants are shown in <Table 2>.

Both models of the linear regression model and the curvilinear regression model(quadratic model) are suitable. However, in the curvilinear regression model(quadratic model), the independent variable did not significantly affect the dependent variable. Only the linear regression model showed that the independent variable had a significant effect on the dependent variable. If we express the result of the linear regression model as a relational expression, we can make a relational expression of y=5.838+0.004x(y=naturalization index, x=population density). When looking at the value of R^2, the explanatory power was not very large at 4.5%.

We analyzed that the naturalization Index of naturalized plants has a positive correlation that increases the naturalization Index as the population density increases.

Table 2. Model summary and parameter estimation values of naturalization Index and population density.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.045	8.609	1	182	.004**	5.838 (.000)	.004 (.004)	
Quadratic	.046	4.390	2	181	.014*	5.712 (.000)	.006 (.197)	-3.177E-06 (.649)

Independent variable= population density

Note: *p<.05, **p<.01,***p<.001.

The results of the correlation analysis between the naturalization index and forestry ratio of naturalized plants are shown in <Table 3>.

Both models of the linear regression model and the curvilinear regression model(quadratic model) are suitable. However, in the curvilinear regression model(quadratic model), the independent variable did not significantly affect the dependent variable. Only the linear regression model showed that the independent variable had a significant effect on the dependent variable. If we express the result of the linear regression model as a relational expression, we can make a relational expression of y=10.421-0.056x(y=naturalization index, x=forestland ratio). When looking at the value of R^2, the explanatory power was not very large at 3.2%.

We analyzed that the naturalization index of naturalized plants has a negative correlation that decreases the naturalization index as the forestland ratio increases.

Table 3. Model summary and parameter estimation values of naturalization index and forestland ratio.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.032	6.022	1	182	.015*	10.421 (.000)	-.056 (.015)	
Quadratic	.038	3.584	2	181	.030*	-2.008 (.865)	.293 (.373)	-.002 (.287)
Independent variable= forestland ratio								

Note: *p<.05, **p<.01,***p<.001.

The results of the correlation analysis between the naturalization index and the farmland ratio of naturalized plants are shown in <Table 4>.

Both models of the linear regression model and the curvilinear regression model(quadratic model) are not suitable. We analyzed that the farmland ratio did not affect the increase or decrease in the naturalization index.

Table 4. Model summary and parameter estimation values of naturalization index and farmland ratio.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.013	2.478	1	182	.117	5.330 (.000)	.062 (.117)	
Quadratic	.031	2.864	2	181	.060	2.603 (.118)	.412 (.040)	-.010 (.074)
Independent variable= farmland ratio								

Note: *p<.05, **p<.01,***p<.001.

The results of the correlation analysis between the naturalization index and the land ratio of naturalized plants are shown in <Table 5>.

Both models of the linear regression model and the curvilinear regression model(quadratic model) are suitable. However, in the curvilinear regression model(quadratic model), the independent variable did not significantly affect the dependent variable. Only the linear regression model showed that the independent variable had a significant effect on the dependent variable. If we express the result of the linear regression model as a relational expression, we can make a relational expression of y=5.159+ 0.706x(y=naturalization index, x=land ratio).

When looking at the value of R^2, the explanatory power was not very large at 4.9%. We analyzed that the naturalization index of naturalized plants has a positive correlation that increases the naturalization index as the land ratio increases.

Table 5. Model summary and parameter estimation values of naturalization index and land ratio.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.049	9.287	1	182	.003**	5.159 (.000)	.706 (.003)	
Quadratic	.049	4.669	2	181	.011*	4.938 (.000)	.977 (.280)	-.067 (.757)
Independent variable= land ratio								

Note: *p<.05, **p<.01,***p<.001.

The results of the correlation analysis between the naturalization index and the road ratio of naturalized plants are shown in <Table 6>.

The linear regression model shows that the model is suitable, and the independent variable has a significant effect on the dependent variable. If we express the result of the linear regression model as a relational expression, we can make a relational expression of y=4.930+ 0.658x(y=naturalization index, x=road ratio). When looking at the value of R^2, the explanatory power was not very large at 2.7%.

We analyzed that the naturalization index of naturalized plants has a positive correlation that increases the naturalization index as the road ratio increases.

Table 6. Model summary and parameter estimation values of naturalization index and road ratio.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.027	5.062	1	182	.026*	4.930 (.000)	.658 (.026)	
Quadratic	.027	2.542	2	181	.082	5.310 (.004)	.288 (.866)	.083 (.826)
Independent variable= road ratio								

Note: *p<.05, **p<.01,***p<.001.

The results of the correlation analysis between the naturalization index and the river ratio of naturalized plants are shown in <Table 7>.

Both models of the linear regression model and the curvilinear regression model(quadratic model) are suitable, and the independent variable has a significant effect on the dependent variable. If we express the result of the linear regression model as a relational expression, we can make a relational expression of y=5.157+ 0.215x(y=naturalization index, x=river ratio). The explanatory power was at 2.6%. If we express the result of the curvilinear regression model as a relational expression, we can make a relational expression of y=1.774+1.444x-0.099x^2(y=naturalization index, x=river ratio). The explanatory power was at 6.8%, which was 4.2% higher than that of the linear regression model.

The naturalization index of naturalized plants has a positive relationship that increases the naturalization index as the river ratio increases and then has a negative correlation that decreases again after a certain point.

Table 7. Model summary and parameter estimation values of naturalization index and river ratio.

Model summary and parameter estimates								
Dependent variable : naturalization index								
Model summary						Parameter estimates		
Equation	R squared	F	Degree of freedom 1	Degree of freedom 2	Probability of significance	Constant term	b1	b2
Linear	.026	4.855	1	182	.029*	5.157 (.000)	.215 (.029)	
Quadratic	.068	6.604	2	181	.002**	1.774 (.176)	1.444 (.001)	-.099 (.005)
Independent variable= river ratio								

Note: *p<.05, **p<.01,***p<.001.

4. Conclusion

Naturalized plants were introduced artificially or naturally and were not culled in the natural ecosystem. Naturalized plants became indigenous for themselves and have coexisted in their way. They have a wide range of tolerances and are spreading by producing many seeds continuously at a fast growth rate[21][22].

Therefore, we tried to analyze the distribution characteristics of naturalized plants centering on the Gyeongsangbuk-do area.This study based on the flora survey data of 133 map numbers(184 places), the national natural environment survey data in the Gyeongsangbuk-do Province. We investigated differences in naturalized plants by population density, forestland ratio, farmland ratio, land ratio, road ratio, and river ratio and analyzed the correlation between the naturalization index by items.

The contents of this study are summarized as follows.

First, the naturalization index of naturalized plants showed differences in four items, such as population density, farmland ratio, land ratio, and river ratio. Still, there were no statistical differences in the two items, such as forestland ratio and road ratio.

Second, the naturalization index of naturalized plants had a positive correlation that increases the naturalization index as the population density increases and had a negative correlation that decreases the naturalization index as the forestland ratio increases. The farmland ratio did not affect the increase or decrease in the naturalization index.

There were positive correlations that the naturalization index increases as the land ratio and road ratio increase. In addition, the naturalization index had a positive correlation that increases the naturalization index as the river ratio increases and then had a negative correlation that decreases again after a certain point.

These results of this study can be used as data to select priority areas to manage naturalized plants and as basic data to study the naturalization index and environmental change of naturalized plants.

However, we propose that studies on the inflow path, distribution status, and management plan of naturalized plants between domestic regions should be continuously conducted at the administrative level of local governments.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	BY	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	CK	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	HL WL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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HUMAN & DISASTER: The Stress of Police Officers in Respect to Educational Background and Employment Path

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Abstract

Purpose: *The purpose of this study is to verify differences arising from different educational backgrounds and employment paths in order to maintain performance capability and establish an effective management system through personnel management of security police, which is one of the job stress factors of the police related to human disasters.*

Method: *In this study, among police officers in the security department as of 2020 who had experience in work related North Korean defectors, 100 trainees in the Police Human Resources Development Institute were surveyed via self-administration method. Among the collected survey questionnaires, 91 were selected as valid samples, excluding those whose answers were incomplete or missing.*

Results: *As a result of the study, differences arising from different educational backgrounds showed a significant difference with a significance level of 5% in Q-2 and Q-8. The difference in stress depending on the employment path was significant with a significance level of 5% in Q-1, Q-3, Q-4, Q-5, Q-6, Q-7, Q-10, and Q-11.*

Conclusion: *When assigning works to individuals according to their educational background, the works assigned to those with a low level of education should not conflict with each other, and the work environment should be improved to relieve the burden of excessive responsibilities for those with a high level of education. In addition, the analysis on the differences arising from different employment paths suggests that the stress of conflicting works for security police officers who have been employed through special recruitment needs to be relieved, and improvements should be made to reduce the stress of high responsibility and excessive workload for those who became a security police officer as a cadet.*

[Keywords] ***Human & Disaster, Police, Job Stress, Educational Background, Employment Path***

1. Introduction

Police are a key institution that carries out national security activities. The purpose of such security activities is to protect the lives and property of the people by maintaining national order, preventing crime, and enforcing the laws. In order to achieve the purpose, the police cope with various crimes and threats against the country and the people by preventing crime, suppressing, investigating, protecting victims, guarding, conducting counter-spying and counter-terrorism operations, collecting information, controlling traffic, performing international cooperation, ensuring public welfare and order in accordance with the Act on the Performance of Duties by Police Officers[1].

However, due to responsiveness and complexity of incidents/accidents, high demands for job performance, limited human relations, and characteristics unique to police duties that are apparent during the process of contacting the public, police officers experience greater job stress compared to other organizational members[2][3][4]. In fact, job stress of police officers

has been increasing as the demand for security is on the rise due to increasing intelligent crimes, such as industrial spy and cyber terrorism which are led by rapid growth of industry and technology, and new threats caused by the diversification of crime measures[5].

Job stress can be caused by various factors and moderate amount of job stress is considered as a positive influence for achieving goals and developing abilities. However, accumulated stress can cause exhaustion and deviation, which in turn, may lead to illegal or negative consequences such as job turnover, corruption, and suicide[6][7][8]. Furthermore, as an element that has negative impacts on factors such as satisfaction and performance of individuals and organizations, the cause, control, and treatment of job stress has been examined in various studies[9][10][11].

As such, changes in a social environment and job characteristics unique to police officers, as well as the job stress perceived by them, may have a significant impact on the quality of security service. If so, effective first-line security activities for public safety cannot be expected without devising effective measures to reduce the job stress of police officers[12][13][14][15].

Therefore, this study, as a basic study to reduce the job stress of police officers, conducted Anova verification of stress, focusing on the educational background and employment path among the demographic and social characteristics of the security police in Korea.

2. Research Method

2.1. Research subjects and sampling method

In this study, among police officers in the security department as of 2020 who had experience in work related North Korean defectors, 100 trainees in the Police Human Resources Development Institute were surveyed via self-administration method. Among the collected survey questionnaires, 91 were selected as valid samples, excluding those whose answers were incomplete or missing.

Table 1. The general characteristic of the research subjects.

	Description	N(%)	Total
Gender	Male	61(67.0%)	91
	Female	30(33.0%)	
Age	20s	7(7.7%)	91
	30s	28(30.8%)	
	40s	30(33.0%)	
	50s or older	26(28.6%)	
Education	High school	14(15.4%)	91
	Junior college	30(33.0%)	
	College	43(47.3%)	
	Graduate school	4(4.4%)	
Rank	Policemen/women	1(1.1%)	91
	Senior policemen/women	19(20.9%)	
	Assistant inspector	18(19.8%)	
	Inspector	29(31.9%)	
	Senior inspector	14(15.4%)	
	Superintendent	10(11.0%)	
Employment path	General recruitment	75(82.4%)	91

	Special recruitment	5(5.5%)	
	Police academy	2(2.2%)	
	Police cadet	9(9.9%)	
	Other	0(0.0%)	
The total length of service as a police officer	5 years and less	13(14.3%)	91
	6-10 years	32(35.2%)	
	11-15 years	13(14.3%)	
	16-20 years	13(14.3%)	
	Longer than 20 years	20(22.0%)	
The length of service at the security department	2 years and less	16(17.6%)	91
	3-5 years	56(61.5%)	
	6-10 years	17(18.7%)	
	Longer than 10 years	2(2.2%)	
The number of police officers in the organization	10 or less	18(19.8%)	91
	November 15	42(46.2%)	
	16-20	24(26.4%)	
	More than 21	7(7.7%)	
Service location	Tier 1 areas(big cities)	80(87.9%)	91
	Tier 2 areas(small/medium-sized cities)	11(12.1%)	
	Tier 3 areas(rural areas)	0(0.0%)	

2.2. Measuring instrument

The appropriate method for each verification method was chosen to increase the content validity and verify the construct validity of the questionnaire. Content validity was validated through consultation with relevant experts to adopt survey questions suitable for the purpose of the study, and the reliability of the survey questions was shown to be Cronbach's αcoefficient .834.

Table 2. The questions.

	Questions
Q-1	I often face conflicting demands.
Q-2	I get conflicting demands from two or three people.
Q-3	I am in charge of work that needs to be done differently depending on the situation.
Q-4	I have clearly established missions and goals for my job.
Q-5	I definitely know my role.
Q-6	I know my responsibilities for my role.
Q-7	I clearly feel the scope of my responsibilities for my role.
Q-8	The degree of responsibility for my work is clearly defined.
Q-9	I feel the need to reduce some of the roles I play.
Q-10	I feel that my roles are too many.
Q-11	I have too many responsibilities.
Q-12	I have too much workload.

Q-13	I have so heavy workload that the quality of my work is disturbed.

2.3. Data processing and analysis method

The data processing of this study was performed by using the SPSS 23.0, a statistical package program, to perform statistical verification for the purpose of data analysis as follows:

First, frequency analysis was conducted to identify general characteristics using the SPSS/PC+23.0 program.

Second, Cronbach's α coefficient was calculated for the reliability verification of the questionnaire.

Third, One Way ANOVA was conducted to understand the difference in stress depending on educational background.

Fourth, One Way ANOVA was conducted to examine differences in stress according to employment path.

3. Result

3.1. Differences in stress according to educational background

<Table 3> shows the differences in stress according to educational background. In Q-2 and Q-8, a significant difference with 5% significance level was found, and the subjects whose educational attainment is high school showed the highest level of stress in Q-2.

In addition, those who hold a high school diploma were found to have a higher level of stress compared to others who graduated from a junior college, university, or graduate school. In Q-8, subjects with graduate school education showed the highest level of stress, and those who graduated from a junior college, university, or graduate school were found to have a higher level of stress than others whose highest level of education is high school.

Table 3. Differences in stress according to educational background.

		N	M	SD	F	sig	Post hot
Q-1	High school	14	3.6429	.49725	2.251	.088	
	Junior college	30	3.0667	.78492			
	University	43	3.1163	.76249			
	Graduate school	4	3.0000	.81650			
Q-2	High school	14	3.5714	.64621	3.416	.021	A>B,C,D
	Junior college	30	3.0000	.74278			
	University	43	3.0233	.55585			
	Graduate school	4	2.7500	.50000			
Q-3	High school	14	3.2143	.80178	.028	.994	
	Junior college	30	3.2333	.72793			
	University	43	3.1860	.76394			
	Graduate school	4	3.2500	.50000			

Q-4	High school	14	2.9286	.61573	.476	.700	
	Junior college	30	2.9667	.61495			
	University	43	3.0930	.71760			
	Graduate school	4	3.2500	.50000			
Q-5	High school	14	2.8571	.66299	2.161	.098	
	Junior college	30	3.1667	.69893			
	University	43	3.3488	.81310			
	Graduate school	4	3.7500	.95743			
Q-6	High school	14	2.7857	.57893	2.068	.110	
	Junior college	30	3.2000	.61026			
	University	43	3.3256	.77830			
	Graduate school	4	3.2500	.95743			
Q-7	High school	14	3.0000	.67937	.632	.597	
	Junior college	30	3.2667	.69149			
	University	43	3.3023	.74113			
	Graduate school	4	3.2500	.95743			
Q-8	High school	14	2.2143	.42582	5.743	.001	B,C,D>A
	Junior college	30	2.9000	.75886			
	University	43	3.0000	.81650			
	Graduate school	4	3.7500	.95743			
Q-9	High school	14	3.0714	.61573	.735	.534	
	Junior college	30	3.1000	.75886			
	University	43	3.3256	.71451			
	Graduate school	4	3.2500	1.25831			
Q-10	High school	14	3.3571	.74495	.699	.555	
	Junior college	30	3.1667	.59209			
	University	43	3.3953	.69486			
	Graduate school	4	3.2500	.95743			
Q-11	High school	14	3.0714	.61573	1.822	.149	
	Junior college	30	2.9333	.58329			
	University	43	3.3256	.80832			
	Graduate school	4	3.0000	1.15470			

Q-12	High school	14	3.0714	.73005	.466	.707	
	Junior college	30	3.0000	.58722			
	University	43	3.1628	.65211			
	Graduate school	4	3.2500	.50000			
Q-13	High school	14	3.0714	.91687	.915	.437	
	Junior college	30	2.9000	.66176			
	University	43	3.1395	.55982			
	Graduate school	4	3.2500	.50000			

Note: A: High school, B: Junior college, C: University, D: Graduate school.

3.2. Differences in stress according to employment path

<Table 4> shows the differences in stress according to employment path. In Q-1, Q-3, Q-4, Q-5, Q-6, Q-7, Q-10, and Q-11, a significant difference with 5% significance level was found. In Q-1 and Q-3, those who became a police officer through special recruitment showed a higher level of stress compared to others whose employment path involves general recruitment. On the other hand, ex-cadets and police academy graduates were found to have a higher level of stress compared to those who became s police officer through general recruitment in Q-4. In Q-5, Q-6, Q-7, Q-10, and Q-11, ex-cadets showed a higher level of stress compared to police officers employed through general recruitment

Table 4. Differences in stress according to employment path.

		N	M	SD	F	sig	Post hot
Q-1	General recruitment	75	3.0533	.73325	4.518	.005**	B>A
	Special recruitment	5	4.0000	.00000			
	Police academy	2	3.5000	.70711			
	Police cadet	9	3.6667	.70711			
Q-2	General recruitment	75	3.0400	.64599	.927	.431	
	Special recruitment	5	3.4000	.89443			
	Police academy	2	3.0000	.00000			
	Police cadet	9	3.3333	.70711			
Q-3	General recruitment	75	3.0933	.73839	4.187	.008**	B>A
	Special recruitment	5	4.0000	.00000			
	Police academy	2	3.5000	.70711			

	Police cadet	9	3.6667	.50000			
Q-4	General recruitment	75	2.8933	.60568	8.727	.000***	C,D>A
	Special recruitment	5	3.4000	.54772			
	Police academy	2	4.0000	.00000			
	Police cadet	9	3.7778	.44096			
Q-5	General recruitment	75	3.0933	.73839	6.342	.001**	D>A
	Special recruitment	5	3.4000	.54772			
	Police academy	2	4.0000	.00000			
	Police cadet	9	4.1111	.60093			
Q-6	General recruitment	75	3.0533	.67570	8.539	.000***	D>A
	Special recruitment	5	3.4000	.54772			
	Police academy	2	4.0000	.00000			
	Police cadet	9	4.1111	.33333			
Q-7	General recruitment	75	3.1067	.68917	6.303	.001**	D>A
	Special recruitment	5	3.6000	.54772			
	Police academy	2	4.0000	.00000			
	Police cadet	9	4.0000	.50000			
Q-8	General recruitment	75	2.8267	.72360	2.653	.054	
	Special recruitment	5	2.4000	.89443			
	Police academy	2	3.5000	.70711			
	Police cadet	9	3.4444	1.23603			
Q-9	General recruitment	75	3.1600	.73595	1.527	.213	
	Special recruitment	5	3.0000	.70711			
	Police academy	2	3.5000	.70711			
	Police cadet	9	3.6667	.70711			

Q-10	General recruitment	75	3.2400	.63331	2.776	.046*	D>A
	Special recruitment	5	3.4000	.89443			
	Police academy	2	3.0000	.00000			
	Police cadet	9	3.8889	.78174			
Q-11	General recruitment	75	3.0400	.66658	5.440	.002**	D>A
	Special recruitment	5	3.0000	1.00000			
	Police academy	2	3.5000	.70711			
	Police cadet	9	4.0000	.70711			
Q-12	General recruitment	75	3.0533	.63445	1.084	.360	
	Special recruitment	5	3.2000	.44721			
	Police academy	2	3.0000	.00000			
	Police cadet	9	3.4444	.72648			
Q-13	General recruitment	75	3.0533	.65540	.443	.723	
	Special recruitment	5	2.8000	.83666			
	Police academy	2	3.0000	.00000			
	Police cadet	9	3.2222	.66667			

Note: A: General recruitment B: Special recruitment, C: Police academy, D: Police cadet.

4. Conclusion and Discussion

This study conducted Anova verification on job stress, focusing on the security police's demographic and sociological factors of academic background and employment path.

The difference in stress according to education level showed a significant difference at a significance level of 5% in Q-2 and Q-8. In Q-2, the subjects whose educational attainment is high school showed the highest level of stress in Q-2. It is consistent with the results of previous studies that showed subjects whose highest level of education is high school have the highest stress[16]. This question corresponds to a stress arising from conflicting works, and demonstrates that the lower the education level, the higher the stress for conflicting works.

In Q-8, subjects with graduate school education showed the highest level of stress, and those who graduated from a junior college, university, or graduate school were found to have a higher level of stress than others whose highest level of education is high school. The question is related to having a clear goal for work, and it can be interpreted that the higher the education level, the higher the stress caused by responsibilities and goals.

In other words, those with a low level of education have a higher level of stress for conflicting

works, while those with a high level of education have a higher level of stress related to responsibilities and goals.

In Q-1, Q-3, Q-4, Q-5, Q-6, Q-7, Q-10, and Q-11, a significant difference with 5% significance level was found.In Q-1 and Q-3, those who became a police officer through special recruitment showed a higher level of stress compared to others whose employment path involves general recruitment. The questions are related to the stress caused by conflicting works and the result reveals that those who became a police officer through special recruitment get more stressed by conflicting demands compared to other police officers.

On the other hand, ex-cadets and police academy graduates were found to have a higher level of stress compared to those who became s police officer through general recruitment in Q-4 whereas ex-cadets showed a higher level of stress compared to police officers employed through general recruitment in Q-5, Q-6, and Q-7. As the questions are related to responsibilities and goals, the results indicate that ex-cadets and police academy graduates highly perceive the job stress coming from responsibilities and goals.

In Q-10 and Q-11, ex-cadets showed a higher level of stress compared to those who became a police officer through general recruitment. The question corresponds to workload-related stress, and the result demonstrates that ex-cadets perceive the highest level of stress for workload-related job stress.

Based on the difference verification for the job stress of security police officers, the works assigned to those with a low level of education should not conflict with each other, and the work environment should be improved to relieve the burden of excessive responsibilities for those with a high level of education. In addition, the analysis on the differences arising from different employment paths suggests that the stress caused by conflicting works should be relieved especially for the security police officers who have been employed through special recruitment, and the stress due to high responsibility and excessive workload of ex-cadets should be reduced by making improvements through work environment, personnel management, and orchestrated shakeup for division of work and cooperation appropriate for available resources and capabilities[17][18][19][20].

It is hoped that the results of this study, which analyzed the differences in stress according to police officers' education and employment paths, contribute to the personnel policies of police organizations.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Lead Author	SB	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑
Corresponding Author*	SJ	-Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	CL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Inequality of Safety and RISK in Korea: Unstable Workers at Risk

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Abstract

Purpose: *This paper focuses on the microscopical and qualitative evolution of the mode of capital accumulation by the capitalist system based on market expansion. It will discuss how 'the changed' conditions surrounding humans in 21st century capitalism are fundamentally inconsistent with the essentially 'unchanging' needs for human safety, and ultimately how this is regressing the discussion of human nature.To this end, this paper attempts to examine the following questions: First, who enjoy the right to security that is in touch with the essential human needs, or who are the main exposure to danger? Second,how does the inequality of wealth lead to the inequality of risk?*

Method: *To investigate the above research questions this study focuses on the number of industrial accident deaths in Korea, which is more than twice the number of deaths from Corona 19, and analyzes who are more at risk. To this end, the Ministry of Employment and Labor's industrial accident statistics were used to analyze which workers are more exposed to risk.Based on this objective data showing the level of inequality of risk, this study tries to interpret qualitatively the fundamental reasons for it from the critical perspective of capitalistic accumulation.*

Results: *The need for safety is an essential trait for all human beings, but it is always changed and refracted according to social and class conditions. That is, the reality proves very well that safety is commercialized and that members of society are in an unfavorable situation with regard to risk. Risk inequality is multiply structured between developed and developing countries, primary and subcontracted firms, and regular and non-regular workers. Developed countries and subcontractors are trying to pay safety costs at a lower price through outsourcing of risks rather than internal investment in safety, and in the end, it is workers engaged in unstable labor that bear this outsourcing risk.*

Conclusion: *The intrinsic need for safety is the same for everyone and therefore for all workers.However, if safety is not distributed fairly and only 'some people' can be exposed to danger, workers who can purchase safety based on a stable material base will want to avoid the risk as far aspossible. The veto power to avoid exposure to risk in a commodified capitalist system of safety can only be exercised on a stable material basis.On the other hand, unstable workers with weak material bases have low bargaining power to reject risks and instead have high dependence on market income. Therefore, in order to secure safety, market income must be earned even at the expense of safety rather than the ability to pay the price of safety.*

[Keywords] ***Inequality, Human Safety, Unstable Worker, Capital Accumulation, Outsourcing of Risk***

1. Introduction

In 2020, we witnessed covid-19 pandemic broke out all over the world. One lesson we have learned through pandemic is that we humans are still getting the short end of the stick in this age of sophisticated technology. We have come to realize that the state and science and technology, which we have been absolutely blind to as a condition for protecting and promoting human life,

are in fact incompetent.In fact the interest in life safety in Korean society began in earnest during the Sewol ferry accident in 2014.During the Sewol ferry disaster in 2014, safety in particular began to emerge as an important topic of democracy and human rights. In order not to repeat the tragedy of the Sewol ferry, Korean human rights organizations have announced the 4.16 Declaration of Human Rights on Dignity and Safety in 2015.In Article 1 of this Declaration, "Human life and dignity must be guaranteed first. Money or power cannot precede human life and dignity."[1]. With the Corona 19 pandemic that took place in 2020, however, life safety has emerged as a key social agenda at the global level.

The global epidemic of covid-19 reminds us that it is the time of great transition. One of the key issues that we need to ask in this age of transition is about human conditions. In any form, human beings as a social reality in the changing history are bound to be the beings who constantly redefine themselves[2]. This is because the conditions surrounding human nature can change ceaselessly. Even so, it is difficult to say that human nature itself changes just because human survival conditions change.If human nature is unchanging, then the need for 'safety' in human beings from the beginning to present time will have an important relationship with human nature[3].

Now, due to the various risks created by the industrial society, it is transitioning to a global risk society that cannot solve problems at the level of the traditional welfare state[4]. During the early industrialization process, diseases, deaths, industrial accidents, and unemployment are the most common causes of poverty in the labor market. Rapid globalization of economy, changes in industrial structure, and changes in demographic structure are rapidly emerging new social risks such as instability in the labor market, dissolution of families, gender issues, caring issues and so on. Now, as new and old social risks interact, the characteristics of social risks become complicated, and risks are concentrated in a specific class or group. Despite the fact that risks are becoming more complex and layered, existing studies have focused only on specific phenomena of risk and are confined to limited discussion.First, in a view of social policy Theytend to demand improvement of government policies that can effectively cope with working conditions, health, and discrimination in terms of social welfare[5][6][7][8][9][10]. Second, in the organizational approach there are studies that appeal to the human right to sympathize with the suffering of the socially underprivileged at the ethical level, or consider inequality as a significant conflict factor between members at the organizational level and propose to resolve it[11][12][13][14]. Third, considering the fact that the social environment is becoming increasingly dangerous, there are studies urged to develop one's inner capacity from danger and anxiety from a psychological point of view[15][16][17]. As a result, they have overlooked the underlying cause behind the phenomenon on the surface, and remain in a superficial discussion. In other words, existing studies are focusing on solving problems revealed as phenomena in the short term rather than paying attention to the root cause of the problem.Therefore, it is necessary to note that today's social risk arises as the neoliberal profit-seeking method of capitalism is more elaborately developed, and it is necessary to analyze that it is intensifying the polarization of wealth and the inequality of risk.

This article focuses on the evolution of the microscopical and qualitative method of capital accumulation accomplished by the capitalist system for market expansion, although the fundamental needs for human safety and survival are essentially unchanged. I will discuss how 'the changed' conditions surrounding humans in 21st century capitalism are fundamentally inconsistent with the essentially 'unchanging' needs for human safety, and ultimately how this is regressing the discussion of human nature. To this end, this article attempts to raise the following two questions.First, who enjoy the right to security that is in touch with the essential human needs, or who are the main exposure to danger? Second, How does the inequality of wealth, which is the material basis for human survival, lead to the inequality of risk?

2. Analysis of the Inequality of Risk in Korea

As of April 30, 2021, one year after covid-19 entered Korea, the cumulative number of covid-19 deaths in Korea was 1,831. Meanwhile, the number of people who died from industrial accidents in 2019 alone exceeded 2,000 and Korea has consistently ranked first among OECD countries. People who fall while working, get stuck, amputated, get sick from occupational diseases, end their lives on their own due to workplace harassment and cannot return home, are more than twice the number of deaths caused by covid-19 per year. However, the whole people in Korea are not sensitive to death at work. If you imagine that seven workers die every day[18], many more get sick while working, and the size of the pain left in their family's hearts, the dangers of the workplace may be a common danger that I and my neighbors can also experience at any time. But unlike threatening the whole people by sending out belief that anyone can be infected with corona virus, the danger at work is up to 'certain people', not myself. In particular, the Corona 19 disaster showed even more nakedly that the safety of workplace was inequally guaranteed to only one side.

The Korean labor market and inequality increase the risk of socially and economically vulnerable groups in the Corona 19 pandemic[19]. For safety from infectious diseases, some workers could choose not to face each other. However, other workers were constantly forced to do face-to-face work. The recent successive deaths of courier workers from overwork showed that they were exposed to complex risks of infectious diseases and overwork because they could not choose not only to distance themselves from infectious diseases but also to rest from work. It is speculated that the Corona 19 disaster situation is exacerbating the inequality of risk. If so, it is necessary to examine in more detail who are not free from dangers in the workplace and who are threatened with safety. If safety is not equally distributed and only 'certain people' are exposed to danger, then rather than asking for common safety in solidarity with everybody, each person will want to avoid the dangers experienced by certain people just as far as possible[20]. In a recent study about the differences of risk-taking among socio-economic classes in Germany after covid-19, Hajo et al.[21] found that wage earners' corona-related risk experiences are vertically stratified. In each of the three wage-earning work logics, the lower classes have significantly higher risks of experiencing work-related health and economic risks compared to the academic and semi-academic occupations of the upper classes. Production workers, office clerks and service workers report both higher infection worries and insufficient protective measures compared to technical experts, managers & administrators and socio-cultural professionals. Income losses and increases in job uncertainty are also more widespread among the occupations belonging to the lower classes.

Figure 1. Industrial accidents status.

Which workers are more at risk in Korea? Although many workers are still excluded from the industrial accident safety net, the number of deaths in industrial accidents in Korea is gradually decreasing according to the statistics compiled only for workers who are officially covered by industrial accident insurance(See <Figure 1>). However, whereas Denmark, Sweden and Germany, which are advanced welfare states, have an industrial accident mortality rate of 0.8 to 1 per 100,000 people, Korea still shows a 5-fold higher industrial accident mortality rate of 5 people[22]. In addition, the overall accident rate is recently rather increasing, and it can be seen that the accident rate at the workplaces with less than 300 employees is also increasing. Find out which workers are more at risk of industrial accidents. Looking at the size of workplace and considering the statistics that the industrial accident rate as of 2019 was three times higher in workplaces with less than 5 employees(1.15%) than in workplaces with more than 5 employees(0.48%), workers in small workplaces have a higher industrial accident rate(See <Table 1>).

Table 1. Accident rate by the size of workplace(2019).

	Number of workers	Number of the injured	Accident rate
Total sum	18,725,160	109,242	0.58
Fewer than 5 employees	2,996,744	34,522	1.15
More than 5 employees	15,728,416	74,720	0.48
5~49	8,166,782	49,156	0.60
50~99	1,942,824	7,825	0.40
100~299	2,459,398	8,263	0.34
300~999	1,679,624	5,355	0.32
more than 1,000	1,479,788	4,121	0.28

Note: Accident rate(%)=proportion of the number of the injured per 100workers with workers' compensation insurance.
Source : Ministry of Employment and Labor(2020), Occurrence of Industrial Accident in 2019.

Compared to regular workers, non-regular workers who are in an unstable employment relationship are exposed to risks. More than half of non-regular workers did not subscribe to national pension, health insurance, or employment insurance[23]. In addition, they are excluded from the safety nets that support sick workers such as sick leave and paid leave. Looking at sick leave system most needed for sick workers, about 60% of regular workers have a sick leave system in their company, while less than 20% non-regular workers have a sick leave system. In particular, a group of atypical workers whose employment relationship is ambiguous is identified as the most vulnerable group among non-regular workers[24]. In other words, workers who are more likely to be exposed to the vague workplace environment and who are more likely to be in a situation where they become sick while working are also weaker in their follow-up safety nets.

Another notable indicator is the outsourcing of risk and the industrial accident mortality rate of subcontractors. A young worker who died in an accident while maintaining the safety gates at Guui station in the Seoul subway in 2016, and Kim Yong-gyun, who died of being caught in a machine at the Taean Thermal Power Plant in 2018, were both contract workers of subcontractors. More than 86% of industrial accident deaths in Korea occur at workplaces with fewer than 50 employees, and 90% of workers who die while working are subcontrac-

tors[25]. The question of outsourcing risks to subcontracting has been raised in a number of existing studies[26][27][28][29]. In particular, with the spread of the employment relationship called in-house subcontracting, subcontractors are not only receiving less wages than the primecontractors while performing more intensive and dangerous jobs in the same workplace. Specifically, as a result of the difference in the accident rate between regular workers at the original office and non-regular workers under the in-house subcontract, death accidents were concentrated in internal subcontractors, and the difference in accident rates between the primary and subcontractors was also increasing. In addition, with regard to the level of health, according to the results of regular health checkups and surveys of the shipbuilding industry's primary and subcontracted workers, the health of subcontractors was worse than that of the primary[30][31].

3. Commodified and Unstable Labor

As explained in the previous section, when risk is concentrated on unstable labor, it is necessary to consider the underlying reason for unstable labor. The process by which capital continuously fine-tuned and evolved its capital accumulation strategy has changed the conditions surrounding workers. And this also affected instability of work. Since the 1970s, the diversification of incidentals except core competencies, geographical movement, and the method of accumulation through flexible response in the labor market, labor process and consumption market have begun to replace Fordism, a form of production which was based on mass production systems and fixed labor[32]. Like this changes in the method of capital accumulation through micro-adjustment had a great influence on workers' instability. In the process of outsourcing all but core competencies by companies(especially this outsourcing, which has expanded with globalization, has expanded the scope of its production process geographically into a global chain), pressure can be applied to lower costs and increase efficiency. Developed countries have undertaken subcontractors in developing countries to reduce costs and accumulate capital. In addition, subcontractors expanded as all but core competencies were outsourced within the country. A prime contractor seeking flexibility outsources various capabilities and parts to subcontractors in a way that mass-produces standardized goods, and subcontractors who have to sign contracts with prime contractors seeking flexibility and low unit prices have an asymmetrical relationship with them.

As a result, the pressure for low unit prices often keeps the wages of subcontractor workers low, and they are exposed to risk in the workplace. Workers are threatened with safety. In a rapidly changing market, workers work long hours to meet the contract hours. Employers of subcontractors are also passive in investing in equipment for industrial safety as a motive for capital accumulation. Workers also have a greater marginal utility of market income earned by working more than receiving safety training. Flexibility in the production process, supported by subcontract and small production, requires manpower flexibility, which entails minimizing the number of key workers and increasing the number of unstable and flexible workers even in subcontractors. Thereby, employers can reduce personnel management costs, layoff costs, skilled investment, and social insurance costs by utilizing atypical ambiguous employment relationships ranging from non-regular workers, special employment, freelance and platform labor.

As Karl Polanyi put it, commodification is transformed into being subject to market rules, which is the result of market expansion[33]. Here he noted that market expansion converts into commodities, such as labor, land, and money that were not present for sale in the first place. And it is explained that these are fictious commodities because it is entirely fictious to convert things that are not originally for sale into goods.

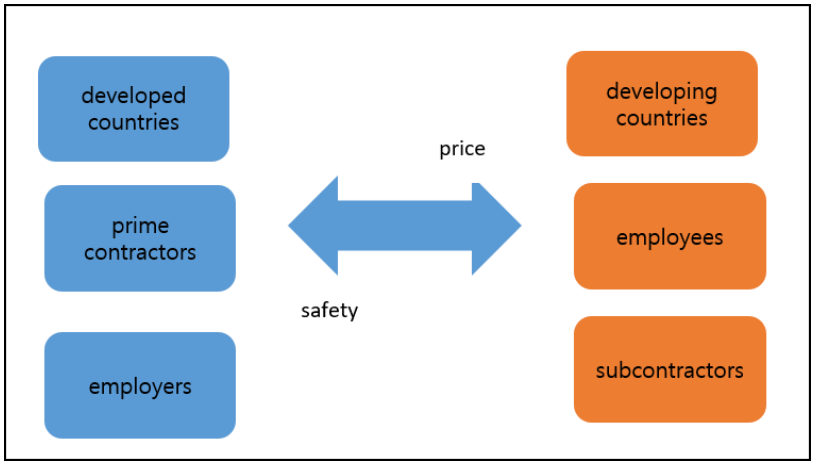
Workers' instability increases when the labor force in which workers' lives are embedded, as well as those essential to the lives of individual, are commodified. As commodified labor must survive, what is necessary for the reproduction of labor is commodified, and workers' material base is expended, thereby increasing workers' dependence on market income. The quality of life of a worker is greatly influenced not only by the level of wages and income, which are the values of the labor force sold and commercialized, but also by the degree of commercialization of the nature, environment, housing and things that surround him or her for everyday life. Therefore, it can be said that the welfare state is decommodifying not only labor but also many things surrounding human life, that is, creating and evolving in pursuit of resistance of capital accumulation[34].

4. Fictious Commodification of Human Safety

Now, let me look at how the inequality of wealth, which is the material basis for human survival, is combined with that of safety. To this end, it is intended to show that only those who have secured a stable material base through the commodification of human safety within the capitalist system and the purchasing power of individuals and subjects enjoy safety. Safety, which is closely related to the preservation of human life, is of a nature that must be guaranteed as a minimum right for human dignity, such as natural or basic rights, not for sale by nature. Safety is very important for the reproduction of work, but it is also the fundamental foundation necessary for life itself, the preservation of life, which is the essence of human beings.Nevertheless, if safety is priced, the instability of workers who have to pay for safety to secure will increase. Conversely, if the instability of labor is high, they will try to sell even commodified safety at the expense of their own safety. Those with low bargaining power to counter the method of capital accumulation are also risky because they have a weak economic and political basis to refuse to do dangerous things.In exchange for selling safety, workers receive an inexpensive'safety price' and run into risk.

As mentioned earlier, Polanyi explains that land, labor, and money are not originally commodities for sale.However, transformed from land to rent, labor to wage, and money to interest, theyare mobilized in the process of capital accumulation. Human safety is an attribute that should not be sold by nature, but it has become a fictious commodity.Looking at the development of capitalism during the industrialization period, the mode of production of capitalism inevitably had the risk of threatening the safety of workers.Employers tend to curb investments in improving working conditions such as wages, working hours, and work environment as much as possible in order to achieve the purpose of capital accumulation.The more low-wage workers who work for survival, the more they have to choose to work in a dangerous environment.

Figure 2. Outsourcing of risk.



The process of fine-tuning conditions surrounding workers shows that capital commodifies safety through outsourcing of risk. As Fordism was replaced by a flexible capital accumulation method, things other than core competencies were decentralized by way of outsourcing, and this outsourcing was carried out by subcontracting in the process of expanding the geographical movement from developed countries to developing countries[35], the flexibility of the labor market, and the labor process. It resulted in the outsourcing of risk. In the process of expanding the outsourcing of the 'work-off' method, developed countries and prime contractors paid low safety costs through outsourcing of risk rather than internal investment in safety.On the other hand, developing countries, subcontractors, and unstable workers who have been paid for inexpensive safety sell a fictious product of safety. They have no choice but to be exposed to risk posed by the lack of not only investment in safety but alsosecurity by government regulations, choosing to endure dangerous environments and workplaces. Changes in the method of capital accumulation through such micro-adjustment have a great influence on workers' instability and exposure to risks.Workers' weak bargaining power and the rigidity of the welfare state have resulted in delays in the system which covers unstable labor, further expanding the blind spot of the social safety net[36]. The costs required for the reproduction of labor are eventually paid privately, which inevitably increases the degree of dependence on the market of workers.

The price of commercialized safety is paid inexpensively to unstable workers from developed countries to developing countries, from original companies to subcontractors, from employers to workers, and finally from stable workers who have secured a material base. Developing countries, subcontractors, workers, and among others, unstable workers are forced to give up the same security at a low price, and are exposed to more risks due to the lack of safety(See <Figure 2>). The inequality of wealth, which is the material base, leads to inequality of risk, and the inequality of risk, like the Mobius strip, contributes to the inequality of wealth.

5. Conclusion

The intrinsic need for safety is the same for everyone and therefore for all workers.However, if safety is not distributed fairly and only 'certain people' can be exposed to danger, workers who can purchase safety based on a stable material base will want to avoid the risk experienced by 'certain people' as much as possible. The veto power to avoid exposure to risk in a commodified capitalist system of safety can only be exercised on a stable material basis.On the other hand, unstable workers with weak material bases have low bargaining power to reject risks and instead have high dependence on market income. Therefore, in order to secure safety, market income must be earned even at the expense of safety rather than the ability to pay the price of safety.At this time, the solidarity between workers(regular workers) who have a stable material base and unstable workers(non-regular workers) are in a structure that is difficult to form.

Previous studies on inequality have usually focused on policy options that can reduce social risks in terms of social welfare.As a result, policy discussions on social safety nets such as jobs, working conditions, and health insurance became the main focus.Whereas these discussions can contribute to some extent in alleviating the immediate problem of inequality, they cannot be a fundamental prescription.This is because any discussion is bound to treat with it superficially without an understanding of the social structural factors that cause inequality and how they work.Of course, it would be practically impossible to solve all the problems at once.However, as Corona 19 warns us, we are faced with a situation where we have to do total reflection and radical reform.The problem of social inequality has long been a problem not only in Korea but also worldwide.Corona 19 is urging us to clearly recognize that point. In this regard, this study emphasizes the attention of the fundamental causes of the various dangers facing us, and furthermore, it seeks to urge the readjustment of the social system to meet human safety needs.

In his book *Risk Society*, Ulich Beck says that in industrial society, belief in progress, such as economic development, wealth growth, and scientific and technological development, is the dominant driver[37]. The problem is that this belief has become a modern dogma at the same time as 'a license of unplanned and unconsensual continuous social change towards the unknown'. In this context, he characterizes the present age as "the society is facing artificially created self-destructive possibility", and says that progress in industrial society is no different from 'the progress of self-destruction'. Beck's insight that the industrial society will eventually lead to a self-destructive and dangerous society may not just talk about the problem of natural destruction such as environmental problems, but more essentially predict a self-defeating catastrophe that destroys even our human nature.

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Author	HN	-Set of concepts☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on the Improvement Plan of the Creation and Management of HEALING FORESTS

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Abstract

Purpose: *The purpose of this study is to identify and analyze the current status of the creation and management of healing forests in Korea to derive the improvement plan.*

Methods*: Based on the hypothesis that there will be differences in the creation and management of each operator, 10 items including annual status, regional status, location standard, size, facility status, number of visitors, number of program users, management entity, construction cost, and operation status were investigated and analyzed.*

Results: *The number of healing forests has been steadily increasing, and the area of composition has been found to be large. By region, Jeolla-do has the largest number of places, 7 places (25%), Gyeonggi-do (30%) has the largest area of composition, and the average area of composition is more than twice as large as the national public. In the forest species of healing by location criteria, coniferous forests were preferred, and trees of age class IV had higher frequency and area.*

There is no difference in the accessibility of each operator to healing forests by size and facilities, and there were many healing forest paths as forest healing facilities. The average number of program users and average visitors per year has been decreasing since 2015. According to the status of each management entity, the Western Regional Forest Service manages the most with a total of nine national and seven public places, while the Eastern Regional Forest Service manages two places. The average creation cost of the healing forest is KRW 4.5 billion/place for the national healing forest, KRW 6.4 billion/place for the public healing forest, and in the case of the average creation cost per area, KRW 0.6 billion/ha for the national healing forest and KRW 0.9 billion/ha for the public healing forest, and the national healing forest is lower. In the case of operation status, the usage fees are in the order of public, national, and private, and the National Forest Service is operated by the Korea Forest Welfare Institute under the Korea Forest Service.

Conclusion: *'Based on the improvement plan for healing forest creation and management, the evaluation items for healing forest creation and operation to introduce a certification system for healing forests should be presented, research on revitalization measures should be conducted, and many people should benefit from forest welfare services.*

[Keywords] ***Healing Forests, Forest Healing, Forestry Culture, Natural Recreation Forest, Forest Paths***

1. Introduction

Forests have long been a place of human life and a place of life, and even in people's consciousness, forests have been recognized as places of protection[1]. Numerous forests have been damaged around the world since the Industrial Revolution, and the forest area has been steadily decreasing in Korea[2]. Increasing income from industrialization provided convenience in daily life, but increased stress and chronic diseases. Therefore, people have diversified their

*This Paper Summarizes Myunghee Kim's Daegu Haany University Master's Thesis.

perspectives on existing forests with an interest in the healing effects of nature, and since 2007, they have started to create healing forests for human health and immunity using various environmental factors[3].

Although various concepts were used in relation to healing forests, healing forests were defined by the Forest Culture and Recreation Act as forests created to enhance the body's immunity and heal the mind and body by utilizing various elements of nature such as scent scenery[4]. The Korea Forest Service has implemented the "Healing Forest" policy since 2007, and it has been found that 28 healing forests are in operation so far in 2019. Such healing forests, along with existing forest baths and natural recreation forests, are being developed and developed into forest culture and recreation spaces to promote the health of the people[5].

Research on healing forests is still somewhat insufficient, but looking at prior studies so far, there are cases studies on forest healing activities and forest policies in Japan and Germany[6][7], as well as studies on the creation of healing forests and basic planning[8][9]. In addition, a study comparing differences in the system of forest healing projects in Japan and Korea and differences in forest policies[10] and a satisfaction survey analysis of forest users of healing programs were derived[3]. In addition, there is a study on healing forest paths in Korea and Japan that identifies how users experience the healing effect[11], and there are studies aimed at providing basic data for developing and implementing forest healing programs using urban forests[12][13].

Considering the prior research on healing forests, collecting and analyzing itemized data on the status of healing forest creation and management operations is required in establishing policies efficiently, but related research is very lacking. This study investigated and analyzed the current status of creation and management operations divided into national, public, and private healing forests, which are the operators of healing forests, and aims to be used as basic data necessary for efficient management and operation of healing forests.

2. Methodology

2.1. Subject of study

Based on the Korea Forest Service's annual forestry statistics report in 2020, 28 healing forests nationwide were studied. However, healing forests under creation were excluded from the subject site of study. Korea began to create a healing forest in 2007 and operated the first National Saneum Natural Recreation Forest in 2009. The scope of this study is as shown in <Table 1>.

Table 1. Scope of this study.

Classification	Operators			
	National	Public	Private	Total
Healing forests	10	17	1	28
28(Subject site of study)				

2.2. Research method

This study considered prior research on healing forests and examined the development of healing forests. In order to understand the current status of healing forests, 11 years of forestry statistics for national and public and private healing forests from 2009 to 2019, data uploaded on the Korea Forest Welfare Institute website and Korea Forest Service website, the reply materials to requests for information disclosure, and telephone interviews. If information on forests of the same healing differs, the Korea Forest Service data was applied first. In addition, efficient management of forests of healing is

considered, investigated, and quantified. As to the current status of healing forests in Korea(5 items) and the improvement of management and operation(5 items), it was investigated and analyzed by separating items by operating entity.

2.3. Data processing

This study divided the data on the composition and management operation of healing forests into a total of 10 items, conducted One-way ANOVA for each healing forest operator, and used it to evaluate healing forests by operator with analyzed data.

3. Results

3.1. Analysis on the creation of healing forests

3.1.1. Current status of healing forests by year

Korea began to create healing forests for Saneum Natural Recreation Forests in 2007 and was first operated in 2009 and was found to have created and operated 28 healing forests nationwide by 2019. According to a survey on the status of healing forests by year, 10 out of a total of 28 were created(35.7%) in 2018 and 5(17.9%) in 2019, and the number of healing forests has been steadily increasing so far.

3.1.2. The number of creation and area of the creation of healing forests by region

The number of healing forests by region is 7 in Jeolla(25%), 6 in Gyeongsang(21%), 5 in Gyeonggi(18%), 5 in Chungcheong(18%), 4 in Gangwon(14%), and 1 in Jeju(3%), followed by 10 in national, 17 in public and 1 in private. The area of healing forest by region is in order of Gyeonggi, Jeolla, Gangwon, Gyeongsang, Chungcheong, and Jeju, and the average area of creation by region was 173.5ha for national, 82.7ha for public, and 75.0ha for private, respectively, with the largest national area.

3.1.3. Analysis based on the location criteria of healing forest

The frequency of 28 healing forests was high in the order of other broadleaf forests, oak trees, mixed forest of soft and hardwood, larchs, nut pine trees, and pine trees. In addition, considering the high frequency of coniferous forests as a whole, the high content of phytoncide appears to have created a good healing environment.

The frequency of the age class of healing forest trees, in the receipt of the upper level of the landscape section of the feasibility assessment criteria, the age class IV with an evaluation score of 4 points is 27(96.4%), the three-point age class III is 20 places(71.4%), and the national and public sectors were all high, indicating that they were built in scenic areas.

Based on the most distributed age class in one healing forest, the area of each age class was large, followed by age class IV(1778ha) and age class V(633.4ha), and the national, public and private sectors were all wide. In terms of accessibility based on intercity bus terminals, Yesan Healing Forest was the closest at 2.7 km, Daeunsan Healing Forest was the farthest at 18.9 km, with an average of 10.1 km, 17 public and 12.9 km, showing no significant difference in accessibility to national, public or private healing forests.

3.1.4. Analysis of healing forest creation area

The total area of the healing forest was 3,215.7ha and an average of 114.8ha, with the total area in the order of national, public and private, and the average area was 173.5ha, more than double that of the public 82.7ha.

3.1.5. Analysis of facilities in healing forests

According to the Korea Forest Service's data on forest healing facilities and convenience/sanitation facilities, no forest healing facilities were created, and healing forest paths were the most favored by healing forest users.

3.2. An analysis of the management and operation of healing forests

3.2.1 Analysis of healing forest visitors

The total number of visitors per year to the forest of healing increased to 1,067 in 2009, 1,173,348 in five places in 2015, and 1,861,226 in 28 places in 2019. The average number of visitors was the highest at 234,670 in 2015, but it was five in 2015 and more than five times increased to 28 in 2019, and the total number of visitors seems to have increased, but the average number of visitors continues to decline.

3.2.2 Analysis of healing forests users

The total number of program users per year increased from 1,067 to 320,810 between 2009 and 2019, with the average number of program users being the highest from 1,067 in 2015 to 22,334 in 2015. Since then, the total number of program users has steadily increased to 320,810 in 2019, but the average number of program users has continued to decline from 22,334 in 2015 to 11,458. The total number of program users and visitors per year was 1,067 in 2009 with 1,067 visitors to one location, and the total number of visitors increased from 70,063 in 2010 to 1,861,226 in 2019 and 3,063 in 2010 to 320,810 in 2019.

The average number of program users and average visitors per year increased from 1,067 average visitors and 1,067 average program users in 2009 to 2015, and then decreased since 2015. In 2015, the average number of visitors was 234,670 and the average number of program users was 22,334 with the highest average number of visitors, but the number of program users and the average number of visitors has decreased since then, the report showed. In terms of the number of quarterly program users, only annual status was managed in the early stages of healing forest operation, and the current status was recently determined quarterly. Over the past three years, the number of quarterly program users was the highest in the third quarter of 2017(summer), the fourth quarter of 2018(fall), and the second quarter of 2019(spring), with the lowest number of program users in the first quarter of winter. In the case of the public, most forest healing instructors do not work on short-term contracts in the winter, so the number of users is believed to be small due to the decrease in program operations.

3.2.3. Analysis by operator of healing forests

The number of healing forest sites by operator is the largest in the Western Regional Forest Service with seven public and nine public, followed by the Northern Regional Forest Service with a total of seven and the Eastern Regional Forest Service with two. Among a total of 1,570ha of the five local forest offices nationwide, the Western Regional Forest Service was the largest at 610.0ha, and the Central Regional Forest Service was the smallest at 79.2ha.

3.2.4. Analysis of the creation cost of healing forests

The creation cost of 28 healing forests was: KRW 45 billion for 10 national places and KRW 4.5 billion for an average; KRW 108.8 billion for 17 public places and KRW 6.4 billion for an average; KRW 95.6 billion for a private place. The National Cheongtaesan and the National Jangseong Cypress were the lowest at KRW 2.1 billion, and the Palyeongsan Cypress was the highest at KRW 28 billion, and the Mangyeong Daesan was the lowest at KRW 2.1 billion. In the creation cost per area, National Jangseong Cypress was the lowest at KRW 0.1 billion/ha, National Daeunsan was the highest at KRW 2.0 billion/ha, and the public was the lowest at KRW 0.2 billion/ha for the Pine-Nut-Scent-Green-Forest, and Palyeongsan was the highest at KRW 2.8 billion/ha. The average of creation cost per area was KRW 0.6 billion won/ha for the national and KRW 0.9 billion/ha for the public, with the national showing less.

3.2.5. Analysis of the operation of healing forests

The average fee for healing forests was KRW 9000 for the national average, KRW 5600 for the public, and KRW 20000 for the private, in the order of public, national and private.

4. Discussions

For 28 healing forests operated in 2019, the state of creation, management and operation by 10 items such as year, region, location standard, scale, facility, number of visitors, number of program users, management subject, creation project cost, and operation status were investigated and analyzed. And based on the results, the followings are discussed.

4.1. The creation of healing forests by year and region

The number of healing forests is steadily increasing, and the area of composition is large. By region, Jeolla-do has the largest number of places(25%), Gyeonggi-do(30%) has the largest area of creation, and the average national creation area is more than twice as large as that of the public. According to the study by Cheon-bo Park and Jun-sung Choi[14], many large-scale healing forests have been opened since 2011, medium-sized and small-scale since 2014, and small-scale after 2016. These results report that local governments are competitively creating forests[15], and compared to the results of this study, healing forest creation is increasing, but it can be seen that it is becoming smaller.

4.2. Forest species distribution of healing by location standard

The forest species of healing by location preferred coniferous forests, and the age class of trees had a high frequency and area of age class IV. The frequency analysis of the species showed that the frequency of other broadleaf forests, oak trees, mixed forests of soft and hardwood, and pine trees was high. The average area of each species is large in the order of cypress, cedar, pine, and coniferous forests with high phytoncide emissions. The age class of trees showed that the healing forest was created in a place with beautiful scenery and a good healing environment, given the high frequency and area of the age class IV. The frequency and area of trees with age classes between 31 and 50 years old seems to be due to the forest-greening project in the 1970s, and as the number of trees over 40 years increases, it is expected to become a healing forest containing various healing factors and beautiful scenery[16][17].

4.3. The size and facilities of healing forests

There is no difference in the accessibility of each operator to healing forests by size and facilities, and there were many healing forest roads as forest healing facilities. Analysis of accessibility to healing forests showed no significant difference in accessibility to national, public, and private areas, with the forest of budget healing closest at 2.7km and the forest of Daewoonsan healing at 18.9km.

According to the Korea Forest Service's data on forest healing facilities and convenience/sanitation facilities, no forest healing facilities were created, and healing forest paths, the preferred forest healing facilities for healing forest users, were the most common. It will be necessary to continuously add facilities and conduct constant management and evaluation to ensure that they are properly utilized after creation[18].

4.4. The number of healing forest visitors and users

The average number of program users and average visitors per year has been decreasing since 2015. In particular, there were fewer program users in the first quarter(Winter). The total number of visitors and program users appears to increase, but the average number of visitors and program users continues to decrease compared to the increase in the number of locations. The current status of quarterly program users was managed only annually in the early stages of healing forest operation, and it was recently found that the current status was determined quarterly. The number of quarterly program

users over the past three years was the highest in the third quarter of 2017(summer), the fourth quarter of 2018(fall), and the second quarter of 2019(spring), and the lowest number of program users in the first quarter of three years. In the case of public sector, most forest healing instructors are short-term contract workers in winter, and since they do not work, the number of users is judged to be small due to the decrease in program operation. The program should be operated throughout the four seasons, including winter, using various healing factors of nature by having a forest healing instructor on duty at all times[19][20].

4.5. Operators and creation cost of healing forests and status of operation

According to the status of each operator, the western regional forest office manages the most with a total of nine national and seven public offices, while the western regional forest office manages the largest with 610ha and the central regional forest office with 79.2ha. The average creation cost of the healing forest is KRW 4.5 billion/place for the national healing forest, KRW 6.4 billion/place for the public healing forest, and in the case of the average creation cost per area, KRW 0.6 billion/ha for the national healing forest and KRW 0.9 billion/ha for the public healing forest, and the national healing forest is lower. In terms of operation status, the usage fees are in the order of public, national, and private, and the National Forest Service is operated by the Korea Forest Welfare Institute under the Korea Forest Service. The analysis of healing forest usage fees showed that the average personal usage fees were 9000 for national KRW 5600 for public KRW, and KRW 20000 for private KRW, in order of public, national and private. The National Forest Service operates the healing forest, which is under the Korea Forest Welfare Promotion Agency, and the public is entrusted to the forest healing profession. In addition to the forest healing instructor, the National Forest Service has more people to operate. It will be necessary to increase the number of forest healing instructors and operating personnel in public areas with a large number of places to support the development and operation of various programs along with job creation[21][22].

5. Conclusion

The following conclusions were drawn from this study on the development and management of 28 forests in total, including 10 national forests, 17 public and 1 private forest in Korea in 2019.

First, the creation of healing forests is steadily increasing, and there are relatively many 7 places(25%) in Jeolla area and the area is wide.

The average area of the national healing forest is 173.5ha, which is more than twice as wide as the public healing forest 82.7ha. The average construction cost is 4.5 billion won/ha for the national healing forest and 6.4 billion won/ha for the public healing forest, so it will be more efficient to increase the national healing forest composition with less average construction cost.

Second, the number of visitors to the forest and the number of program users increased in the management and operation status, and the number of program users was the lowest in the first quarter of winter.

In the case of public, most of the forest healing instructors do not work as short-term contract workers in winter, so the number of users is low due to the decrease in program operation.

The program should be operated throughout the four seasons including winter by increasing the number of people in the public sector entrusted to forest welfare specialists and letting the forest healing instructor work at all times.

The forest healing instructors should be able to provide high quality forest welfare services by reflecting the various environments and unique characteristics of each healing forest through stabilization of employment and long-term work.

Third, the Jangseong Japanese cypress healing forest and the forest of the Jungnamjin Japanese cypress healing forest were differentiated into the cedar forest, and the forest of the Seogwipo healing was differentiated into the cedar forest, but most of the healing forests were distributed as other broad-leaved forests, oak forest species and age class IV trees. It is necessary to find natural healing

factors such as the scent and scenery of the unique species of forests of each healing, and to differentiate them by utilizing the regional characteristics such as unique waterfalls, rocks, caves, scenic rivers, and historical and cultural resources.

There were limitations, as data on the forest operation of healing was not available or private before 2016. Therefore, as a plan to improve the forest development and management of healing, it is necessary to present the development and operation evaluation items to introduce the certification system for healing forests based on accumulated data on the management of healing forests. Research should be conducted on how the healing forest can be actively operated so that many people can benefit from forest welfare services. In addition, we hope that various attempts will be made to prevent, recover from diseases and promote health of the people by reflecting/applying the results of this study to establish policies for the efficient management and operation of healing forests.

6. References

6.1. Journal articles

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	MK	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	WL	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	WC	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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A Study on the Establish of Continuous and Long-Term National DISASTER Situation Scenario

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Abstract

Purpose: *In this study, national disasters are defined as the occurrence of cascading disasters taking into account the temporal and seasonal situations, including social crisis conditions such as financial crisis, etc. and large-scale natural and social disasters that occurred in Korea in the past.*

Method: *In order to establish national disaster situations, representative disasters and crisis situations that occurred in Korea were summarized, and national disaster situation scenarios were proposed according to time and situation. The damage caused by the establishment of national disaster situations is expected to be unpredictable. In particular, in the case of an economic crisis such as the IMF, the financial condition of the country is poor, so if cascading disasters occur and the disaster situation lasts for a long time, the government's ability to support may be remarkably difficult.*

Results: *Preparing for such a national disaster is to be able to effectively cope with similar disasters, and the organization of the National Disaster Countermeasure Headquarters was proposed to respond to national disasters. In order to respond efficiently and promptly to national disaster situations, the President should be the head of the headquarters, the National Assembly and the Ministry of Strategy and Finance should be composed of support groups, and the central government organization of 17 departments, 5 offices, 17 government offices, and the head of 17 municipal governments need to be operated as a working organization of the national disaster countermeasure headquarters.*

Conclusion: *In this study, a situation in which the worst disasters occur continuously and in the long term was established, and the situation of national catastrophe was presented as an example. It is absolutely necessary to prepare for such a worst-case situation, and as climate change, social economy become more complex and diversified, and uncertainty about risks increases, it is believed to be helpful to strengthen national response capabilities.*

[Keywords] ***National Disaster, Continuous, Disaster Scenario, Long-Term, Hybrid***

1. Introduction

There is an increasing threat of disaster-type complex disasters worldwide. Problems of complex disasters that cause social disasters are arising due to unpredictable natural disasters and complexity of urban environments[1]. 2020 is becoming a year when the society is almost paralyzed due to the concentration of natural disasters and social disasters caused by COVID 19 and abnormal weather not only in Korea but also around the world. As the number of confirmed cases of COVID 19 that occurred in Wuhan, China in February 2020 rapidly increased, mainly in Daegu, so Daegu and Gyeongbuk became regionally isolated, spreading the fear of COVID 19 nationwide. As of September 5, 2020, the cumulative number of confirmed cases of COVID 19 was 21,010, and the cumulative death toll was 333, showing a fatality rate of 1.58%[2]. Flood damage occurred in many areas of the country due to

the unprecedentedly long rainy season from July to August and No. 8 Typhoon Barbie, and there was an accident in which the banks of the Nakdong and Seomjin Rivers collapsed, followed by No. 9 Typhoon Maisak and No. 10 Typhoon Hisun. which hit the Korean Peninsula in September, were heading north. These unprecedented disaster situations are occurring continuously and in the long term. It is a situation in which the world as well as Korea is struggling to overcome the current society facing a situation where a disaster is occurring for the first time. There was a case where a MERS patient occurred on May 20, 2015, and one super spreader spread virus to 153 people, causing fear of MERS in Korea[1]. Amid the disaster that started with COVID 19 in in 2020, a long rainy season of more than 50 days, successive typhoons, the spread of livestock infectious diseases such as African swine fever, and political and social turmoil, the government's disaster response organization, the Central Disaster Countermeasure Headquarters, is operating year-round, and many central control headquarters are operated, including the Ministry of Health and Welfare, responsible for infectious diseases disasters, the Ministry of Land, Infrastructure and Transport and the Ministry of Public Administration and Security, responsible for storm and flood damage disasters, and local governments across the country are continuously operating regional disaster response headquarters.

A total of 14.2448 trillion won was set and paid as the first disaster support fund due to COVID 19[3], and the second disaster support fund was adjusted to 7 trillion won, and support is under discussion. In addition, the unprecedented long rainy season and flood damage caused by No. 9 Typhoon Maisak and No. 10 Typhoon Haishen are being estimated and are expected to reach several trillion won. It is the reality that there are no national response strategy, local governments' response strategy, and people's response strategy as it is the first to face an unprecedented global and national long-term and disaster sequence nationwide. Research on such national disasters has been steadily conducted. The study of KIPA(2009)[2] emphasized the importance of establishing governance of risk management as administrative, engineering, and social approaches in research on comprehensive national crisis management plans in the event of natural disasters and national crises. MOIS(2011)[3] presented the necessity of studies on systematic training plans for large-scale complex disasters, and proposed the concept of the development of a training model for the occurrence of complex disasters leading to Daegu subway fire-typhoon Maemi-deadly earthquake in Japan–heavy rain although they occurred at different times. Predicting the risks of complex disasters caused by heavy rain to the country, Yun et al.(2018) developed a national risk assessment technique to prepare countermeasures and conducted pilot evaluations in Incheon and Gangwon[4]. Nam(2017) suggested a policy direction necessary to reduce national large-scale damage caused by complex disasters and to establish an efficient complex disaster management system[5]. Titled "Discovery of Ultra-large and Serious Disaster Scenarios and Preparation of a Preliminary Response System", the report of KIPA(2012) suggested that natural disasters such as storm and flood damage, nuclear accidents, and infectious diseases as priority scenarios for super large catastrophes in the future, and said that these could cause damage to the extent of paralysis of the state function[4]. It also included the definitions of super large catastrophes in the future as follows: First, natural, human and social disasters, as well as new and complex disasters are included. Second, there is a high probability of causing extreme damage or damage to the country beyond the capabilities of the national disaster management system. Third, extreme damage includes the scale and extent of the damage and the social(psychological) effect. Eo et al[2019] has conducted research on the occurrence of complex disaster in coastal area[6]. Park[2020] has suggested a long-term and sustainable strategy should be prepared to prevent virus infection in the railroad transportation field, which is one of the pillars of public transportation, and to ensure people's right to move safely[7]. The definition of a large-scale complex disaster has been defined in many prior studies, and Eun said that Japan's nuclear accident was a catastrophe mixed with natural and human disasters[8]. Lee et al

[1] The Korean Society of Infections Diseases. KSID (2017).
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defined the situation as a situation in which natural and human disasters cause secondary disasters as society becomes more advanced and advanced[9]. Sung et al. proposed once defined a large-scale human disaster caused by large-scale natural disasters caused by global warming and urbanization[10]. In addition, Kang said that large-scale damage caused by the complex disaster was extensive and the main cause was natural disasters, and the major infrastructure was destroyed, requiring restoration of the urban redesign level[11]. Eom et al. suggested the importance of restoring destroyed urban functions and redesigning urban functions[12]. Park suggested once presented a training guide in the earthquake complex disaster[13]. Park et al. proposed the need for a legal framework for major disasters[14]. Although many of the previous studies have been conducted on the risk and disaster management of the expansion into national disasters due to complex or continuous disasters, most of them have been conducted on the expansion from a single disaster to the 2nd and 3rd disaster or countermeasures against the increase in the scale of disasters due to climate change, nuclear power plant destruction, large-scale storm and flood damage. However, an emergency situation was developing around the armistice line due to the outbreak of infectious diseases caused by COVID 19 in 2020, followed by storm and flood damage, heat waves, and livestock epidemics caused by African swine fever from the fall of 2019 before COVID 19. The Korean members of society experience the continuation of the national catastrophe situation due to the occurrence of consecutive disasters of different types for the first time after the Korean War. The situation of such a national catastrophe may continue to occur in the future in known or unknown forms such as climate change, the emergence of new infectious diseases, and nuclear accidents. In order to effectively overcome such a national catastrophe, it is very important to set the largest possible disaster situation in Korea and to establish a preparedness plan for this. In many previous studies, much has been done on the Government's response and countermeasures to a single or complex disaster. However, there is a lack of research on disasters that require national responses simultaneously in the long run. No research has been done on the response scenarios for disasters that occur in the past in a timely and long-term manner. Therefore, in this study, we would like to investigate representative large-scale disasters in Korea and suggest ways to establish national catastrophe situations based on them.

2. Establishment of National Disasters

2.1. Definition of national disasters

In Korea, disasters are classified into types of natural disasters, human disasters, and social disasters in the Framework Act on Disaster and Safety Management. National disasters refer to the ones that occur continuously or in combination. According to MOIS(2011), complex disasters were defined in two ways: A phenomenon in which complex damage occurs due to the cause of one disaster and a phenomenon in which multiple disasters occur simultaneously resulting in complex damage[5]. FEMA(2013) and Nam(2017) defined cascading disasters, the type of disasters resulting from the continuous occurrence of several types of single disasters as complex disasters[6]. The concept of disaster continuity is that a second disaster occurs after a single disaster occurs due to the effects of a preceding disaster[15]. In this study, national disasters are defined as the occurrence of cascading disasters taking into account the temporal and seasonal situations, including social crisis conditions such as financial crisis, etc. and large-scale natural and social disasters that occurred in Korea in the past.

2.2. Current status of major disasters in Korea

The following is the current status of disasters and crisis situations that have been of national interest in Korea since the 1990s. On April 28, 1995, 101 people died due to the gas explosion in Sangindong, Daegu, and on June 29, 1995, Sampoong Department Store collapsed in Seoul, resulting in 502

[5] Study on systematic training plans for large-scale complex disasters. MOIS (2011).
[6] Introduction to Hazard Mitigation (2017).

deaths and 938 injuries, shocking the whole nation, and the rescue situation was broadcast live[7]. On December 3, 1997, the lack of foreign exchange reserves in the country caused the IMF financial crisis, the state default situation, where many people have not escaped from its influence, so the people experienced a national economic crisis where the economic growth rate reached -6.9% and many companies went bankrupt[16]. In 2000, a forest fire broke out in Gangwon-do, and cultural assets and 23,138ha of forests were destroyed. In 2002 and 2003, nearly 10 trillion damages were caused by the typhoons Rusa and Maemi. On February 18, 2003, 192 people were killed due to the Daegu subway fire accident. On December 11, 2007, due to the oil spill of the Hebei Spirit in the west coast, the coasts of Taean and the west coast were contaminated with oil, and many volunteers miraculously removed the oil, surprising the whole world. The outbreak of H1N1 influenza between April 2009 and April 1, 2010 resulted in 263 deaths. During the period from November 28, 2010 to April 21, 2011, foot-and-mouth disease spread following H1N1 influenza, causing damages of KRW 2.148 trillion.

In 2014, 299 people died in the sinking of the Sewol ferry, which severely shocked the whole nation, and in 2015, the MERS outbreak of caused 38 deaths[8]. A series of earthquakes in Gyeongju and Pohang in 2016 and 2017 resulted in an unprecedented situation, such as postponement of the College Scholastic Aptitude Test, which became an opportunity to inform the public that Korea is not a safe zone for earthquakes[9]. On April 4, 2019, when a forest fire broke out in Gangwon-do, Step 3 of the response was issued to dispatch fire trucks across the country to Gangwon-do. It is a case remembered as disaster response that impressed the whole nation as a result of concentrating on total capabilities. On January 20, 2020, COVID 19, which occurred in Wuhan, China, flowed into Korea, and in February, the number of confirmed cases was rapidly increasing mainly in Daegu, paralyzing social activities, and global trade and exchanges are suspended due to the rapid increase in corona confirmed patients worldwide. 2020 becomes a year of cascading disasters: From July to August 2020, there was an ever-long rainy season, and storm and flood damage occurs again before the damage is resolved due to the typhoons invading in succession.

3. Establishment and Scenarios of National Disasters and Scenario

3.1. How to establish national disaster situation

In the establishment of a national disaster situation, as mentioned in this study, it is necessary to establish short-term and long-term strategies to check and respond to national crisis response capabilities by establishing past disaster cases and crisis situations in Korea as the worst conditions. In this study, the establishment of national disaster situation assumes that disasters and national crises that occurred in Korea in the past occur continuously. <Table 1> shows the types of disasters and crises that may occur in any period.

Table 1. Classification of disaster occurrence period.

Month	Natural disaster	Social disaster	Any period
1		Fires, extreme cold	Financial risk, traffic accident, pollution, earthquake, collapse, infection disease
2			
3		Yellow dust, fine dust	
4			
5			
6			
7	Floods, drought,		

[7] Korean Social Trends. Statistics Korea (2014).
[8] The basis and casebook of support by type of social disaster. MPSS (2016).
[9] Pohang Earthquake Report. MOIS (2017).

8	extreme heat		
9			
10			
11		Fires, extreme cold	
12			

As shown in <Table 1>, national disaster situations can be established based on the past disasters in Korea by combining the worst disaster situations such as natural disasters, social disasters, and the types of disasters and crises that can occur regardless of period in a timely manner. <Table 2> shows the disasters and crisis situations that occurred in Korea by month.

Table 2. Major disaster occurrence in Korea.

Month	Disaster	Damage
1	COVID 19	Dead 305, isolate 15,039(8.16) etc.
2	Deagu subway fire	Dead 192, etc.
3	-	-
4	Deagu gas explosion	Dead 101, etc.
	East forest fire(2005)	23,138 ha, etc.
	East forest fire(2019)	Victim 1,524, facility damage 535, etc.
	H1N1 influenza	Dead 263, etc.
	Sewol sinking accident	Dead 299, etc.
5	MERS	Dead 38, isolate 16,693, etc.
6	Rainy season and typhoon(2020)	Dead 45, etc.(in counting)
7	Sampoong department collapse	Dead 502, etc.
8	Typhoon rusa	Dead 246, ₩5.1 trillion, etc.
9	Typhoon maemi	Dead 131, ₩4.2 trillion, etc.
	Gyeongju earthquake	Injured 23, victim 111, facility damage 57,039, etc.
10	-	-
11	Pohang earthquake	Victim persons 1,797, injured 135, facility damage 5,868, delay the college scholastic ability test, etc.
12	IMF	Economic growth rate -6.9%, etc.
	Hebei spirit oil spill at taean	29.000 ha, etc.

As shown in <Table 2>. disasters and crisis situations occurred in Korea almost every month, and accidents with great social and economic damages as well as life, property, and facilities occurred. In particular, in the case of the COVID 19 infectious disease, which is currently underway in 2020, it is far from returning to a normal state even though tens of trillions of budgets are being invested in disaster subsidies and economic vitalization.

3.2. Scenarios of national disaster situations

In this study, in order to establish a continuous and long-term hypothetical disaster situation, a disaster situation was established consecutively in consideration of the time of the disaster that occurred in Korea previously described. It explained the government's response situation and the need to establish a national disaster response system by setting up a scenario in which representative social and natural disasters in Korea in the past continued for more than a year. The national disasters established in this study are organized as shown in <Table 3>. by reflecting past disasters and crisis situations among the worst-case disaster situations. First of all, if an infectious disease such as COVID 19 occurs

in January of the following year while the IMF economic crisis occurred in December of last year, financial support, such as disaster subsidies, is expected to be difficult as in 2020. In this situation, situations such as a wildfire in Gangwon-do in April 2019, the longest rainy season that started in June 2020, and storm and flood damage such as Typhoon Rusa in August, may aggravate the disaster situation, leading to the occurrence of victims and shortage of shelters and shelters for victims due to COVID 19.

In this case, the recovery of storm and flood damage and relief of the victims are not performed normally, and the state's financial support is not sufficient in the case of economic crisis such as the IMF. If a situation such as the Pohang earthquake in November occurs in this situation, national chaos will arise and people's lives will be almost paralyzed. In the events of national disaster, the importance of the prepared manual becomes even greater. Ryu(2018) through analysis of operating system of crisis management manual in Korea, this study attempts to suggest the right direction for future improvement[17]. Shin(2017) it can be said that the disaster management work in the local government at the forefront of protecting the lives and property of the people is very important. For large-scale disasters beyond the scope of local government, central government's personnel and budget support is needed, but the primary response is to be conducted quickly and flexibly at the local government level[18]. Lee(2017) research observed the discussion about the existing disaster management policy and present the aim set of the budget for natural disaster prevention by government[19].

When national disaster happens, the central emergency economic headquarters will be operated due to the national economic crisis caused by the IMF, and the central disaster countermeasure headquarters and the central control headquarters of the Ministry of Health and Welfare, headed by the prime minister due to COVID 19, should operate simultaneously. Department will be operated, and the Ministry of Land, Infrastructure, and Transport, the Ministry of Public Administration and Security, and the Ministry of Agriculture, Food and Rural Affairs must operate the central control headquarters due to storm and flood damage. In addition, when the Pohang Earthquake occurs, the Ministry of Education and the like may additionally operate the central control headquarters, which could lead to a national disaster situation in which almost all central ministries operate the central control headquarters. In addition, Gangwon-do should operate regional disaster countermeasure headquarters due to forest fires, and Pohang and Gyeongsangbuk-do should operate regional disaster countermeasure headquarters due to earthquakes. Of course, if the current situation such as COVID19 continues, the national disaster situation in which the disaster countermeasure headquarters are operated in all central and local governments may last for more than one year, as shown in <Tables 3> and <Table 4>.

Table 3. Central government for disaster.

Month	Disaster & risk	Government
12	IMF	Emergency economy central headquater(MOEF)
1	COVID 19	Central disaster headquater(MOIS) Central emergency headquater(MOHW)
2	-	-
3	-	-
4	Forest fire	Central emergency headquater(NFA)
5	-	-
6	Rainy season	Central emergency headquater(MOLIT)
7	Typhoon maemi	
8	-	-
9	-	-
10	-	-
11	Pohang earthquake	Central emergency headquater(MOE)
12	-	-

Note: MOEF : Ministry of Economy and Finance, MOIS : Ministry of the Interior and Safety, MOHW : Ministry of Health and Welfare, NFA : National Fire Agency, MOLIT : Ministry of Land, Infrastructure and Transport, MOE : Ministry of Education.

Table 4. Working government for disaster.

Month	Government				
	Central				Local
	MOEF	MOIS, MOHW MOE	NFA	MOLIT	
12	√				
1	√	√			√
2	√	√			√
3	√	√			√
4	√	√	√		√
5	√	√			√
6	√	√	√	√	√
7	√	√	√	√	√
8	√	√	√	√	√
9	√	√	√	√	√
10	√	√			√
11	√	√			√
12	√	√			√

In the above-mentioned national disaster situation, there is a risk that the administrative organization of local governments may collapse in a situation where the regional disaster countermeasure headquarters of local governments as well as the central ministries should be operated throughout the year. Such national disasters are no t only problems of response and recovery in response to the occurrence of disasters, but also security from infectious diseases and insufficient national support for continuous storm and flood damage and seismic disaster situations due to insufficient national financial capacity according to the IMF situation. In the case of local governments with weak financial resources, normal operation may not be possible, and the living and social and economic activities of the people may also cease.

4. Response Strategy According to Establishment of National Disasters

4.1. Damage due to establishment of national disasters

In the estimation of the damage according to the establishment of the national disaster situations described above, those presented in <Table 2> are national crisis situations. In order to overcome them, a pan-national emergency response and great damage to the people occur and sacrifice is required.

If the national disasters presented in this study occur just for 1 year, there will be more than 605 deaths, more than 3,000 casualties and victims such as injuries, more than 15,000 isolated persons caused by infectious diseases, and the damage to facilities is expected to exceed 10 trillion won. In addition to these damage situations, much more people and facilities may be damaged, the College Scholastic Aptitude Test may be postponed socially, and all existing social orders may fall into chaos. The state's fiscal situation falls into a situation where it cannot support the people, and the people cannot afford to make voluntary efforts such as the gold-gathering campaign to overcome the IMF crisis. Patients quarantined by COVID 19 and victims caused by storm and flood damage and earthquakes have nowhere to go, and are forced to stay in ruined homes, and local governments cannot

afford to support these victims.

By setting such a national disaster situation and establishing a response plan, it is believed that in the event of a national disaster situation smaller than this situation, the national response can be improved. In this study, therefore, we continuously established disasters that occurred in Korea in the past and roughly predicted damage by assuming a national catastrophe situation scenario.

Table 5. Damage for disaster.

Month	Disaster & Risk	Damage
12	IMF	Economic growth rate -6.9%, bankrupt company, mass unemployment, aggravate finance, etc.
1	COVID 19	Dead 305, isolate 15,039(8.16), shrink economic activity, etc
2	-	
3	-	
4	Forest fire	Victim 1,524, facility damage 535, etc.
5	-	
6	Rainy season	Dead 300 over, ₩5.1 trillion over, etc.
7	Typhoon maemi	
8	-	
9	-	
10	-	
11	Pohang earthquake	Victim persons 1,797, injured 135, facility damage 5,868, delay the college scholastic ability test, etc.
12	-	

4.2. Response strategy according to establishment of national disasters

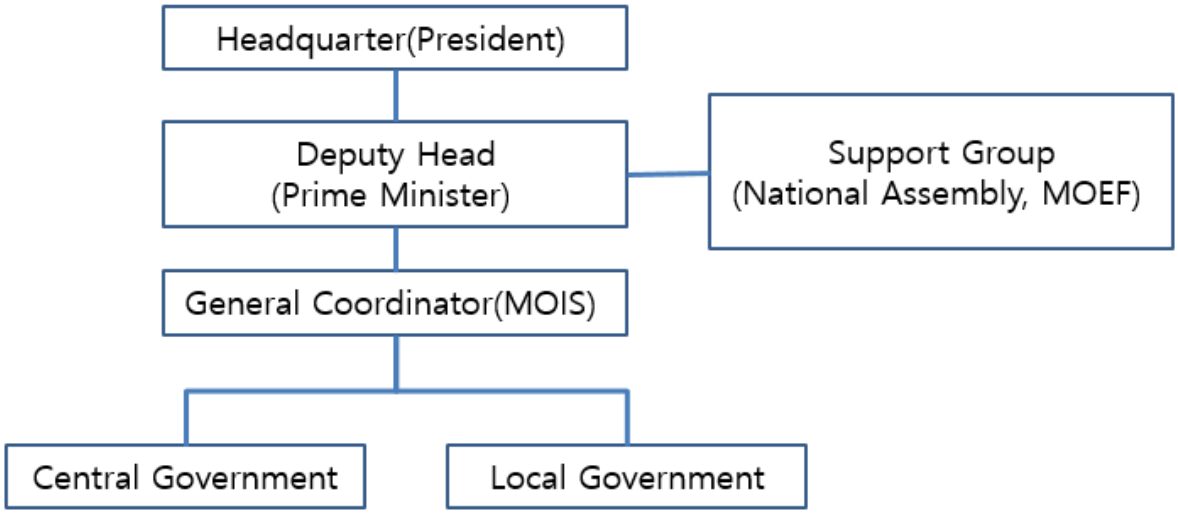
Even if the probability of a national disaster established in this study is 0.00001%, it is necessary to establish a response strategy by assuming such a worst case situation. Similarly, in 2020, COVID 19 and storm and flood damage occurred continuously, and in 2019, a sense of crisis over livestock epidemics was rising due to African swine fever. It is true that in order to cope with the establishment of national disaster situations presented in this study, it is highly difficult to support the people and overcome the disaster in decision making by the operation of the existing central disaster countermeasure headquarters and central control center.

Therefore, in order to respond to national disasters, the National Disaster Countermeasure Headquarters headed by the President, which has upgraded the existing Central Disaster Countermeasure Headquarters, should be operated. In addition, the National Assembly, including members of the National Assembly with decision-making powers of the ruling and opposition parties, the Prime Minister and the Ministry of Strategy and Finance, should be included in the countermeasures headquarters to support budget and laws through rapid decision-making. Headed by the President, the National Disaster Countermeasure Headquarters should be operated by the working teams of the ministers of 18 ministries, 5 offices, the heads of 17 offices, the directors of government offices and the heads of 17 municipal governments, and the National Assembly including the Ministry of Strategy and Finance and the ruling and opposition parties as support teams.

<Figure 1> is the organizational chart of the National Disaster Countermeasure Headquarters according to national disasters. As the National Assembly is included in the National Disaster Countermeasure Headquarters, it is expected that rapid decision-making will be made by directly participating in the organization that coordinates the disaster situation and confirming the role of the National Assembly in the law and budget support that can overcome disasters. As the general coordinator, the Minister of Public Administration and Security plays the role in coordinating with 17 departments, 5 offices, 17 government offices, and 17 municipal governments, enabling efficient disaster response

and recovery.

Figure 1. National disaster organization.



5. Conclusion

In this study, we studied the necessity of preparing for national disasters, which occur continuously and last for a long time, and how to establish national disaster situations.

In order to establish national disaster situations, representative disasters and crisis situations that occurred in Korea were summarized, and national disaster situation scenarios were proposed according to time and situation. The damage caused by the establishment of national disaster situations is expected to be unpredictable. In particular, in the case of an economic crisis such as the IMF, the financial condition of the country is poor, so if cascading disasters occur and the disaster situation lasts for a long time, the government's ability to support may be remarkably difficult. It was found that if the central government's economic support capacity decreases, the local governments' disaster response capacity is almost lost, and the capacity of patients quarantined by infectious diseases and victims caused by storm and flood damage and earthquakes is also exceeded, making it difficult to manage victims due to a disaster. Preparing for such a national disaster is to be able to effectively cope with similar disasters, and the organization of the National Disaster Countermeasure Headquarters was proposed to respond to national disasters. In order to respond efficiently and promptly to national disaster situations, the President should be the head of the headquarters, the National Assembly and the Ministry of Strategy and Finance should be composed of support groups, and the central government organization of 17 departments, 5 offices, 17 government offices, and the head of 17 municipal governments need to be operated as a working organization of the national disaster countermeasure headquarters. It is judged that the role and detailed composition of the national disaster countermeasures headquarter proposed herein should be supplemented and improved through future research.

In this study, a situation in which the worst disasters occur continuously and in the long term was established, and the situation of national catastrophe was presented as an example. It is absolutely necessary to prepare for such a worst-case situation, and as climate change, social economy become more complex and diversified, and uncertainty about risks increases, it is believed to be helpful to strengthen national response capabilities.

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Author	KP	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Chinese Government's Ethnic Minorities Policy and TERRORISM: Focusing on Uyghur's Separation-Independence Movement

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Abstract

Purpose: *The reality is that ethnic conflicts exist in a multi-ethnic society. After the Cold War, the issue of ethnic identity and discrimination, which had been suppressed under the socialist system, was rapidly highlighted, and national division began. However, from the perspective of a dominant nation seeking international status as a powerful nation, the separation of ethnic minorities is considered a crisis of national dissolution, so it tries to thoroughly prevent the separation of minorities. In this process, terrorism occurs and government control and pressure become intense. This phenomenon is considered in this paper.*

Method: *Under the socialist system, the Soviet Union and China have controlled multi-ethnic societies with ideology. However, after the Cold War, an independent state began to be established as a wave of separatist nationalism spread in Eastern Europe, including Russia. China has implemented a strengthened "one China policy" to nip this phenomenon in the bud at home. In particular, it sought to undermine separatist nationalism against the Uyghurs and Tibetans. We examine China's strategy for ethnic minorities and Uyghur's resistance from a historical perspective.*

Results: *Xinjiang is a geopolitical important area. The Chinese government wants to defend against potential Western threats by controlling the region. Some extremist groups of ethnic minorities are also implementing multidimensional policies to fundamentally block armed struggles and attempts to carry out terrorism for secession. The politics of suppression of minorities will continue for the time being because it is not easy to dismantle the cultural and religious identity of minorities.*

Conclusion: *It is a matter that cannot be coerced into assimilating minorities by a dominant ethnic group. If there is no prerequisite for recognizing ethnic differences and policies for national reconciliation, a coercive system will only produce conflict. To ensure that terrorism is not a means of expressing resistance to discrimination, imperial political behavior must be abandoned.*

[Keywords] ***Ethnic Minorities, One Chinese Policy, Shanghai Pact, Re-Education Camp, Separation Independence***

1. Introduction

Futurists predict that the meaning of borders will weaken and the ideology of nationalism will weaken in the process of globalization. However, the unequal hierarchy and subordination order of the capitalist system after the Cold War led minorities to become interested in ethnic identity and religious traditions. Under the Cold War system, if both camps were interested in which it was legitimate to belong, the collapse of real socialism did not prove the triumph of capitalism and the superiority of capitalism. This is because the capitalist system does not have the means to resolve micro or macro conflicts. Competitive liberalism has been guaranteed, but

there are still discriminated minorities. Outsider minorities, especially those under the socialist system, are resisting discrimination or attempting to liberate them from discrimination. This, as Hobsbaum said, is the rise of politics of identity[1].

External challenges to the liberal international order include the rise of 'illiberal states' such as China, Russia and Iran and the spread of terrorist groups. China, the biggest beneficiary of the liberal international order, seeks to create a new international order through new norms and institutions. It is moving beyond the surrounding region to form a sphere of influence against the world. The increase in terror, which is causing extreme fear, is another challenge to the liberal international order. This is because terrorism not only causes fear, but also spreads conflicts between religions, sects and races and causes conflicts between countries[2][3].

China's need to control domestic division has increased further to gain regional hegemony and international status as a powerful country. China has a Han-centered identity, but it is mixed with various minorities and maintains its own cultural and ideological traditions as a subordinate system within the socialist political system. In response, the Chinese government is strongly pushing for a "one China," which seeks to destroy the culture, religion and language of minorities and absorb them into that of the Han Chinese. This strategy of the Communist Party of China is seen by minorities as a threat to survival, which is a factor that stimulates intense resistance. A relatively large ethnic group, and an extreme force within a people with a strong desire to maintain their identity, is growing, resulting in frequent terrorist acts. In this paper, we consider the identity of Uyghur, which resides in China's Xinjiang Autonomous Region, anti-Chinese sentiment and terrorism, and the Chinese government's policy in response.

2. Theoretical Background

2.1. Geopolitical characteristics of Xinjiang regions

China has a population of more than 1.3 billion, similar to India. Although the Han people are an absolute majority, 55 minorities are distributed throughout China. Eighteen ethnic minorities, including the Huis, Uyghurs, Tibetans, ethnic Koreans, Mongolians, and Zhang, are more than one million, while others are less than one. Ethnic minorities are mainly distributed in northeastern, northwest and southwest in China, and mainly live in areas bordering China and other countries. Xinjiang Uyghur Autonomous Region, where Uyghur people reside, accounts for one-sixth of China's total area. Xinjiang Uyghur Autonomous Region borders three Central Asian countries, Kazakhstan, Kyrgyzstan and Tajikistan, and eight other countries, including Afghanistan, Pakistan, India and Mongolia, after the collapse of the Soviet Union[4].

Xinjiang is in a geopolitical position serving as a transport hub and buffer zone for the Eurasian continent. It also has 38% of China's total mineral reserves and 25% of its oil and gas reserves, which are of high economic value. The Han people, who make up the absolute majority of China, live heavily in the middle of China and along the eastern coast. On the other hand, ethnic minorities live on the frontier. Ethnic minorities live in 90% of China's land. Foreigners living outside China's borders and ethnic minorities in China are the same people, though they are bordering each other. For this reason, ethnic minorities living in the border area of China are called 'Cross-boader Ethnicity'. They are distributed in northeastern areas including Inner Mongolia, northwest of the Xinjiang, and southwest regions including Tibet[5].

The Xinjiang is an important point for political and security reasons as it is located in a transportation hub connecting Central Asia and Europe. It is inhabited by the Uyghurs, the largest ethnic minority in China.

2.2. China's embarrassing problem

Some Chinese have religions such as Islam and Buddhism. The Han people, who account for 92% of the population, have created their own culture and assimilated ethnic groups other than

the Han people, but ethnic minorities have maintained their own traditions to this day. China has maintained its policy of recognizing the uniqueness of ethnic groups by establishing autonomous regions as a safeguard against the traditions of ethnic minorities.

There are 55 ethnic minorities in China, including Muslims. The Muslim minorities in China are members of the Huis, Uyghurs, Kazakhs, Dongxiang, Krgz, Salar, Tajik, Uzbeks, Bonams, and Tatars, with 2% of the Chinese population. Among them, the main Muslims are the Uyghur people, the Huis and the Uyghur people. The number of Muslims in China is the fourth largest after Turkey, Iran and Egypt. There are about 9.8 million members of the group, distributed throughout China. The congregation lives with other ethnic groups(Han, Uyghur, Mongol, Tibetan, etc.) in most parts of the country. The Hui people were born with the introduction of the universal religion of Islam into China. It is the congregation that has been combined with some of the existing native Han people in China, including the Arabs and Persians, who entered China with Islam as a catalyst. The ethnic group, derived from national harmony, fairy tales, and unity by Islam, became what it is today through progressive fairy tales as well as religious culture.

On the other hand, the Uyghurs are approximately 8.3 million, mainly in the New River Uyghurs region. Half the population in the area is Uyghurs. Some of the Uyghurs live in China, as well as in Pakistan, Kazakhstan, Kyrgyzstan, Mongolia, Uzbekistan, Germany, Turkey and Russia. Since 2015, about 1 million Uyghurs have been imprisoned in kidney re-education camps. The camp was built under Xi Jinping's government and its main purpose is to make it loyal to Chinese ideology[6].

Historically, the Uyghurs were an independent state, but they began to collapse after the Chinese invasion in 1759. In 1949, Burhan Shahidi, president of the East Turkistan Republic, declared a merger with the Communist Party of China, and many Uyghurs who followed Isa Yusuf Alptekin, the vice president, fled to Turkey. Uyghur is resisting integration into Chinese society more than any other Muslim ethnic group in China. Uyghurs, in particular, are the only Muslim ethnic group in China to experience the establishment of an independent state in the Xinjiang region[7].

For China, the Uyghur issue is a disgrace and an Achilles' heel that they don't want to reveal. China emphasizes anti-imperialism as a basis for one ethical justification for its emergence as the center of imperial order. They also set their ethical justification at the center of a single resistance to the imperial order established by the United States and the West. However, Uyghur's ethnic and human rights issues are a stark testament to the fictionality, immorality and fraud of China's anti-imperialist claims. For this reason, China does not want to expose these issues to the outside world and wants to cover them up[8].

Culturally and religiously, Uyghurs have maintained Islamic religion and culture. These are Sunni Muslims. Therefore, they form a significant religious and cultural consensus and common identity with other Sunni Muslims in Central Asia and the Middle East. On the other hand, they do not share religious or cultural consensus or common identity with the Han Chinese, a mainstream ethnic group accounting for 92 percent of China. Today, the Chinese government attempts to unite the Uyghurs into the Han people, insisting on ethnic harmony and co-prosperity in the Uyghur region. In this process, Uyghurs' culture and religion are systematically suppressed and exterminated[9].

3. Uyghur's Anti-Chinese Sentiment and Terrorism

3.1. Diaspora of uyghur and independence movement

Xinjiang-Uyghur Autonomous Region, northwest of China, is the largest province in China. Historically, the Silk Road was very important in establishing, and served as a bridgehead connecting East Asia and the Islamic world.

Southern Xinjiang was ruled by China from BC 206 to AD 220. It was later ruled by a local Uyghur ruler, but was conquered by Mongolian leader Genghis Khan in the 13th century. It was

again under Chinese control during Qingdai(1644–1911), becoming one of the provinces of China in 1884. However, it was geographically remote and was ruled by local semi-independent warlords. It was ruled by the Communist Party of China in 1949 and became Xinjiang Uyghur Autonomous Region in 1955.

Islam has already been introduced to the region since the 10th century and has been influenced by Islam for a long time. China has repeated occupations and wars over hundreds of years to influence Xinjiang. In the 18th century, it was annexed by the Qing Dynasty, but it was so far from the center of China that it escaped its influence over time. During 1881-1884 some Uyghurs fled to Russia, while others rebelled against China. Between 1864 and 1877, the Muslim kingdom was established, and Russia exerted influence over the region. China regained the region in 1881, and in 1885, it became Province of Xinjiang. In anticipation of China's repression, some Uyghurs were staying in Russia. In 1917, the Bolshevik Revolution in Russia led to the execution of many Uyghurs for anti-Soviet incitement. The Uyghurs' diaspora from Russia to China peaked in the 1930s as Stalin's capitalist and suppression of ethnic minorities increased[10].

Russia gained economic control of Xinjiang, especially after the Communist regime in China. The Soviet Union promoted the industrialization of Xinjiang and encouraged the Uyghurs to move to agricultural areas to secure agricultural labor in neighboring Kazakhstan. Meanwhile, the Uyghurs resisted against the Chinese government, which in 1949 sent troops to the area and made it part of Chinese territory. At this time, it was named the Xinjiang Uyghur Autonomous Region. China expanded collectivization in urban and rural areas and the imprisonment of right-wing people after the communist rule. In the process, the Communist Party of China shut down nationalist facilities in Xinjiang. Some Uyghurs in the Xinjiang region migrated to the nearby Soviet Union, where the Han people entered the Xinjiang region.

However, since then, there have been massive riots, and anti-China sentiment is deeply rooted in the Islamic world. Since the 1950s, ethnic conflicts have continued, and especially since the dissolution of the Soviet Union in the early 1990s[11][12], the Chinese government has strongly suppressed the movement[13][14]. In order to ease the large number of Uyghurs living in the Xinjiang area, the Han people were relocated to the area, and now the Han people are 40%[15].

3.2. Terrorist cells in xinjiang

The Uyghurs are Turkic and, like the Tibetans, are determined to form an independent state away from Chinese rule[16]. Motivated by the formation of an independent state after the collapse of the Soviet Union, the Uyghurs are also resisting Chinese rule. Even before the independence of neighboring countries, Uyghur's anti-Chinese movement continued. From the 1950s to the 1980s, there were 194 anti-Chinese movements and 19 armed struggles, respectively. In the 1990s, he committed more than 200 acts of terrorism, influenced by independence, the Islamic movement, and the Pan-Turkist movement of the Central Asian people[17]. Even after the 21st century, terrorist incidents have not abated, and the Chinese government has been consistent with strong suppression of force and oppressive policies.

The fundamental reason why Uyghur craves independence over other minorities in China is that it has experience as an independent state in previous times, abundant underground resources and labor to run an independent state, and interest in Turkey's Xinjiang Uyghur.

The Chinese government believes that the Xinjiang Uyghurs are the most radical of minorities, linked to external pan-Islamic groups and pan-Turkish forces, given their bombings, armed protests, and attacks on government offices[18]. But information on terrorism centered around Xinjiang comes from the Chinese government, and many people doubt that the information is accurate.

The Chinese government has strong military control, calling the separation of the Xinjiang region and Tibet's independence movement "separatism" and "national divisionism." Separatism refers to activities in which ethnic groups based on blood ties, religion, and language seek to acquire the principles of self-determination and separation by gaining national status. The

reason for the term "nationalism" is concerns that it could lead to the division and dissolution of China, a multiracial country.

The Chinese government announced in January 2006 that 18,227 people were arrested in connection with terrorism or threatened national security. China's Ministry of Public Security said 260 attacks have killed 160 people and injured 440 in the Xinjiang River over the past 20 years. They pointed out that East Turkstan's independent forces are threatening China's security[19].

In January 2007, Xinhua News Agency announced that 18 separatists had been killed and 17 arrested in the mountains of Pamir Highlands in the Xinjiang Uyghur Autonomous Region. The group is ETIM and has trained more than 1,000 terrorists with Al Qaeda support.

The Uyghur terrorist groups in the Xinjiang are the ETIM(East Turkestan Independence Movement), ETLO(East Turkestan Liberation Organization), ETIC and IMU[8].

ETIM is an Islamic separatist group founded by the Turkic minority Uyghurs in northwest Xinjiang, China. The U.S. government also listed the group as a terrorist organization in 2002. Xinjiang Province, where the group is based, is a vast and deserted area bordering eight countries, including Afghanistan and Pakistan. The group's identity was reported in 2000 when a Russian newspaper reported that Osama bin Laden funded the Uzbekistan Islamic Movement and ETIM at a meeting in Afghanistan in 1999. ETIM, known to have been founded by the Uyghurs Hasan Mahsum and Memetuhut Memetrozi, aims to build an independent state of East Turkstan, including Turkey, Kazakhstan, Kyrgyzstan, Uzbekistan, Pakistan, Afghanistan, and Xinjiang Uyghur Autonomous Region(XUAR). The group has a sectarian group in Central Asia and is known for its religious and nationalist ideology[7].

While most Uyghurs try to continue their independent identity while maintaining cultural discrimination against China in a peaceful way, ETIM is using extreme violence. It has been alleged that ETIM was trained by Al Qaeda and created a terrorist organization in Xinjiang, but its leader Masum denied links to Al Qaeda. More than 200 terrorist incidents in Xinjiang between 1990 and 2001 were caused by ETIM, according to a Chinese government report[8].

ETLO was established in Turkey in 1990 to counter the Chinese government. ETLO members were charged with organizing 15 arson cases by the Chinese government, and in 1999, Istanbul police arrested 10 ETLO members on charges of serial attacks on Chinese people in Turkey. One of the members arrested in the April 24, 1998 shooting suspected links to Al-Qaeda because of his statement that he was trained in Afghanistan, but international human rights organizations did not believe the Chinese government's announcement. He dismissed it as a result of the Chinese government's torture of terrorists[13].

Members of the Shanghai Cooperation Organization(SCO) and the United Nations have listed ETLO as a terrorist organization. The United States also listed ETLO as a terrorist organization in 2002, but removed it from its list in 2020. The group operates mainly in Xinjiang, China, but operates throughout Central Asia and Pakistan. ETLO is allied with ETIM, the Taliban and Al Qaeda.

4. China's Anti-Terrorism Policy

4.1. Foreign policy: ‘shanghai pact’

The Shanghai Cooperation Organization(SCO), also known as Shanghai Pact, was a alliance of Eurasian political, economic and security formed on 15 June 2001 in Shanghai, China by leaders of China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Uzbekistan. It was signed in June 2002 and entered into force on 19 September 2003. The original five members were members of the Shanghai 5 Group, which was established on 26 April 1996, except Uzbekistan[16].

After the summit in Astana, Kazakhstan, on 9 June 2017, India and Pakistan joined the SCO as full members, expanding their membership to eight states. Military exercises are regularly conducted between members to promote cooperation and coordination against terrorism and other

external threats and to maintain peace and stability in the region. The SCO cooperates primarily on issues related to the security of its member states in Central Asia, often describing the major threats it faces as terrorism, separatism and extremism.

The Regional Anti-Terrorist Structure(RATS) was established at the SCO Summit in Tashkent, Uzbekistan from 16 to 17 June 2004. The organization has agreed to co-operate with terrorism as well as crime and drug trafficking. The 36th RATS Council meeting decided to hold a joint anti-terrorism exercise, Fabi-Antitera-2021, in Pakistan in 2021. The 36th meeting of the Council of the RATS decided to hold a joint anti-terror exercise, Pabbi-Antiterror-2021, in Pakistan in 2021.

4.2. Control of ethnic minorities by 'one china policy'

China has enacted a joint code of 'Chinese People's Political Consultation Conference', which summarizes the provisions relating to minorities. First, it bans ethnic disdain and pressure, and bans acts that divide ethnic unity. Second, ethnic zone autonomy shall be implemented in areas where minorities live together. Third, each minority has the freedom to maintain or reform customs and religious beliefs.

The code guarantees ethnic minority traditions, the use of their own language and religion, but the reality is different. The autonomous region was granted to the Huis, Uyghurs, Tibetans, and Mongolians, but it is actually controlled by the central government of the Han people. Since 2017, 8,500 mosques have disappeared from Xinjiang, and more than 7,000 are believed to have been damaged. However, as the Chinese government controls the access and information of outsiders, it is difficult to grasp the destructive behavior of the Chinese government in Xinjiang. Since President Xi Jinping's appearance, assimilation policies for minorities have been strongly pursued. The language, religion, and culture of ethnic minorities are being wiped out, and Chinese education in Xinjiang in 2017, Tibet in 2018, Inner Mongolia in 2020, and ethnic Korean autonomous regions has become essential as Chinese education has been strengthened. The name is expanding higher education opportunities for minorities and improving employment rates[15].

The government says it favors minorities in birth policy, entering prestigious universities, and finding jobs, but in reality, it is not. In response to this policy, minorities are protesting, and parents are opposed to Chinese language education and are not letting their children go to school. In order to break down Uyghurs' concentration in Xinjiang, a policy was also implemented to force them to hire factories in other regions. The forced migrant Uyghur workers are under government surveillance.

On the other hand, it implemented policies to bridge economic gaps and regional infrastructure projects for five years. In early 2021, the Chinese government said that it had made remarkable achievements to fight poverty in eight regions where ethnic minorities lived collectively. However, oppression of Uyghurs and discrimination due to the influx of Han people exist. Although the project was to invest $300 billion in the "New Silk Road Strategy," there was discrimination between the Han and Uyghurs. Compared to the North Xinjiang region, the South Xinjiang region, which has more ethnic minorities, has become more economically deprived as a result of less development[5].

In conclusion, China basically has 'One China' as its political motto. "One China" is China's political and diplomatic motto, "People's Republic of China, Hong Kong, Macau and Taiwan are all one country and cannot be separated." It is generally used as a logic to deny Taiwan's identity, but it also refers to China's territorial view that does not allow the separation and independence of 55 minorities in China.

4.3. Strong response to resistance and 're-education camp'

China has institutionalized regulations on terrorism by revising criminal law three times since 1979[20][21].

The Chinese government has blamed separatists, extreme religious forces and terrorist groups as three factors that threaten national security. The separatists are Taiwanese, Tibetan and Xinjiang Uyghur independent groups, extreme religious groups are pseudo-religious groups such as Falun Gong, and terrorist groups are classified as violent separatists such as East Turkestan[22][23].

The Chinese government conducted large-scale military exercises in the Xinjiang region in 2001 to subdue separatists in the Xinjiang region[24].

Another way to counter Uyghur resistance was to establish a re-education camp in the Yingye'er area of Xinjiang Autonomous Region. The Xinjiang Uyghur Autonomous Region Anti-Extremism Act was enacted to establish a re-education camp. The law stipulates that "local governments can establish, operate and supervise educational and educational institutions such as vocational training centers to educate those affected by extremism." The government's claim to prevent Islamism and terrorism is exaggerated, as the concentration camps contain not only those who have committed extreme acts but also those who have been held to prevent minor wrongdoing or crimes. Prisoners are held without formal court proceedings, and religious activities are not allowed.

According to Amnesty International, as many as 3 million Muslims, including Uyghurs, have been held in Xinjiang's re-education camps. Despite international criticism, Chinese authorities argue that re-education camps are necessary to respond to terrorism and extremism, while actively defending them by saying they are "humanitarian vocational education centers."

The camps have armed police, security personnel, security personnel, and troops, teaching inmates the ideology of Marxism-Leninism and Mao Zedong. Inside the facility, they are subject to the same surveillance as prison inmates, and are forced to deny Islam and to familiarize themselves with communist ideology.

5. Conclusion

The Chinese government regards the minority movement as an act of undermining national unity. The independence demonstrations in Tibet and the separation of Uyghurs were violently suppressed by force. The United States and EU members expressed concern about the Chinese government's actions and called for respect for human rights among minorities.

The separation movement between Tibet and Uyghur is a national movement for the restoration of sovereignty[16]. There is no specific leader in relation to Uyghur's national movement, and there is no unified movement organization. The Chinese government's military oppression prevents the Uyghur national movement from becoming a force, but on the other hand, it is not a "concentration" of the national movement and is expressed in the form of sporadic protests or terrorism.

The Han Chinese government claims that Chinese politics and culture come from the Han people and that the culture and history of ethnic minorities are part of China's history. Minorities have maintained their language, religion and culture, but have been forced to brainwash Chinese policies and communist ideology through political and military pressure and ideological education since the Communist Party took power. Although the Chinese government claims anti-imperialism externally, it ironically implements imperial policies against minorities and neighboring countries.

The same applies to other ethnic minorities in China, even to discrimination against the Uyghurs. Although the Uighur issue is intertwined with complex historical and diplomatic issues with neighboring countries, it can be simply understood that it is a factor that hinders China's hegemonic strategy. It is time for solidarity between countries to expand China's hegemonism as a result of coercion and retribution to neighboring countries.

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7. Contribution

7.1. Authors contribution

	Initial name	Contribution
Author	SC	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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Comparative Study of Administrative Business Continuity Plan(BCP) for DISASTER Management of Metropolitan Areas in Korea and Japan

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Abstract

Purpose: *In the event of a disaster, the work of local governments should continue not only to respond to disasters but also to normal work. Therefore, what should be prioritized during normal administrative work, the scale of manpower and resources, priority work in the event of a disaster, and how to effectively use manpower and facilities are important planning elements to be conceived by local governments. This study examines strategies for local governments to continue administrative work in the event of a disaster in a large city.*

Method: *The Administrative Business Continuity Plan(BCP) considers what the administration should do and what to do with the premise of administrative damage and restrictions due to disasters such as manpower and facilities. It is necessary to review the actual activities and conditions for all employees taking into account the information, facilities, facilities, and related organizations necessary to perform a given task in the event of a disaster. This study presented the perspective of BCP as administrative damage, core tasks according to priorities, and specificity of task performance. In addition, it analyzes the administrative BCP in case of an earthquake, taking the case of Tokyo and Osaka, the major cities of Japan.*

Results: *To summarize the characteristics of the administrative BCPs of Tokyo and Osaka Prefecture, they considered what they should do and what they can do while preparing a countermeasure for the upcoming disaster. It is also significant that it was not only aimed at putting such concerns into a plan but also considered a plan that can be put into practice in everyday life. It was made clear that disaster response was not the responsibility of some ministries by collectively sharing the work to be done by departments in the government office*

Conclusion: *First, it is necessary to devise a plan that does not disrupt business performance in consideration of administrative damage. Second, after selecting the core tasks according to the priorities, it is necessary to consider a plan that can be practiced in normal times by cultivating disaster prevention awareness through training or training. Third, agreements should be made in advance not only with all departments in the government building, but also with other local governments in some cases, minimizing the confusion caused by the inflow of external resources in the event of a disaster, and receiving effective support.*

[Keywords] ***Administrative BCP(Business Continuity Plan), Prevention, Analysis, Disaster, Earthquak***

1. Introduction

In South Korea, it is prescribed to establish a safety management plan for local governments based on the guidelines of the Ministry of Government Administration and Home Affairs. However, the concept of maintaining important administrative tasks and promoting early recovery even during a disaster has not been established yet[1].

In such a situation, the establishment of a functional continuity plan(BCP) has been obligated in a total of 245 local governments, including 17 regional governments and 228 basic local governments, by the amendment of the Framework Act on Disaster and Safety Management from January 2018.

The Seoul City Safety Office established BCMS(Business Continuity Management System) before the revision of the law. However, in most local governments, the establishment of functional continuity plans is still at the beginning stage.

Therefore, in the current situation where countermeasures must be prepared urgently, this study aims to discuss the direction of the Korean local governments by analyzing the case of Japan that established the "Business Continuation Plan"(here in after referred to as administrative BCP).

The Japanese administrative BCP case is an empirical plan based on the experiences and lessons learned from the catastrophe. Japan suffered from the Great Kobe Earthquake in 1995 and has emphasized the importance of local disaster prevention as early as possible. The establishment of administrative BCP local governments of not only central ministries but also local governments are mandated, and improvement is being promoted based on the problems revealed in the 2011 Great East Japan Earthquake.

Although there are some prior studies on Japanese administrative BCP in Korea[2][3], this paper is of great significance in that there is no comparative analysis case study of large cities that advanced administrative BCP through empirical lessons after the Great East Japan Earthquake.

The targets of this study are Tokyo and Osaka Prefecture. This study analyzes the BCP strategy for earthquake response administration in large cities in Japan, which have high social vulnerability among local governments, and examines what is effective for Korean local governments.

2. Regional Disaster Prevention and BCP

The 1995 Great Kobe Earthquake was the first major urban earthquake that occurred after the construction of a modern metropolis in Japan. At that time, the Japanese administration was inexperienced in responding to the great earthquake, and there was a setback in supporting residents. For example, the central government's Emergency Disaster Countermeasure Headquarters launched six hours after the earthquake, and the announcement of the emergency countermeasures took more than a day. Among the victims who needed rescue, only about 8000(22.8%) were assisted by the administration(including fire and police), and half of those rescued in this way died(CAO, 2003).

This means that the administration's ability to support disaster response was lost due to the great earthquake, and it shows that the administrative response was not properly prepared in the event of a disaster. In other words, in the case of a major urban earthquake, it is limited to establish a plan based on the completeness of administrative disaster response and support, and if a plan for administrative malfunction is not properly established, it can cause great damage in case of emergency.

The Great Kobe Earthquake provided an opportunity to become aware of the community-based disaster countermeasures that are not administratively driven[5][6][7][8][9]. However, administrative support still plays a very important part in regional disaster prevention and should not be overlooked.

Therefore, the introduction of BCP for earthquake response must be differentiated from existing earthquake disaster prevention measures. This needs to be examined organically from the following three points of view.

2.1. Consideration of administrative damage

Most earthquake disaster prevention plans aim to prevent damage to people and protect property. Therefore, measures for support for victims are dealt with[10][11]. Such support implicitly presupposes the completeness of administrative capacity in case of a disaster.

After a disaster occurs, the administration's disaster response support activities are carried out. It is planned in consideration of the extent of administrative support for the degree of damage in the

region. However, it does not presuppose that the administrative support capacity cannot be fully exercised in situations where administrative functions are partially impaired or paralyzed(the collapse of the government building, the injury of the employee, the difficulty of recruiting the staff, the power outage, the loss of the information system, etc.).

Most earthquake disaster prevention plans assume damage from various situations in the event of a disaster and deal with the local government's responsible entity(relevant departments, etc.) and countermeasures. However, there is no guarantee that the administration will be able to sufficiently carry out all disaster support activities in the event of a large earthquake. Therefore, the function of administration may be lost in the uncertainty of a disaster, and the extent of the administrative function should be considered in advance.

2.2. Consideration of core tasks according to priorities

If the administration is damaged due to the collapse of the government building in the event of a disaster, injuries to employees, and disconnection of power and communication, resources for maintaining function are limited. Therefore, priorities that must be continued in the event of a disaster or that must be carried out over time to support disaster response must be determined in advance. If all tasks are paralyzed, it should be possible to recover from important tasks first[12]. In a disaster situation that is not easily experienced, it is necessary to consider in advance what is the priority among administrative tasks, how much resources such as manpower and infrastructure are needed, and how to share the work with other departments.

Most earthquake disaster prevention measures are devising various measures to prevent the spread according to the damage situation in the area. These countermeasures systematically enumerate the activities and subjects in charge of disaster response, but it is difficult to perform all such activities in case of a disaster[13][14]. Therefore, the core tasks of the administration should be considered in order of priority.

2.3. Consideration of the specificity of business performance due to disaster

In the event of a disaster, the task of responding to disasters can be said to be the most important task in administration and other key missions that we normally operate must also continue. However, it is quite difficult to continuously perform tasks according to priorities in a situation where resources such as manpower and communication infrastructure are scarce due to the damage to the administration[15].

Food and beverages, toilets, and rest areas that promote the convenience of employees performing work should also be reviewed. In some cases, external support is also required, and these cannot be easily applied in case of emergency unless preparations are made in advance through agreements.

In sum, the administrative BCP is a plan that minimizes the damage caused by a disaster by arranging necessary resources in advance to continue core tasks as usual when the administrative functions do not work in the event of a disaster and quickly returning the tasks that should be performed first. In advance, it is necessary not only the disaster prevention department but also all the departments of the local government to share the above issues cooperatively.

3. Trends and Characteristics of Administrative BCP in Japan

In Japan, where large and small earthquakes occur frequently, administrative BCPs are established even though regional disaster prevention plans are complete in metropolitan areas, like our local government's earthquake disaster prevention plans.

The reason for establishing the administrative BCP is to supplement the limitations of the regional disaster prevention plan, which is a legal plan. The regional disaster prevention plan does not presuppose special premise for the damage to the administration or the plan that stipulates the implementation of disaster countermeasures to be carried out in case of a disaster or in advance and the division of roles. Therefore, there is a limitation in that the concept of the priority of work to be restored and

the convenience of the staff performing work in case of a disaster are insufficient because the administrative resource constraints are not considered[16].

In addition, the regional disaster prevention plan focuses on disaster response measures and preliminary preparation measures. However, the main difference is that the administrative BCP considers not only disaster response but also the core tasks for continuing administrative functions[15].

In April 2006, Japan stipulated that the central institutions in the metropolitan area establish an administrative BCP for continuing work and early recovery in the event of an earthquake under the guidelines for measures against the metropolitan subdivisions. In June 2007, the Cabinet Ministry issued guidelines for continuing work of government departments. The point is to explain the concept and operation plan of BCP for business continuity and early recovery in the event of an earthquake in the capital area of central institutions in the metropolitan area, and instructing the establishment of administrative BCP for the above institutions[17]. Through this, the establishment of administrative BCPs for all designated administrative agencies was completed at the end of 2008.

In April 2010, the Cabinet Office prepared guidance and commentary on the work plan of local public organizations in the event of an earthquake and instructed local governments to establish an administrative BCP. As a result, as of June 2017, metropolitan local governments showed 100% and basic local governments 64.2%. It is expected to be 100% established after 2018[18].

Table 1. Development process of administrative BCP in Japan[19].

Date	Subject	Main contents
2006.4	CAO (central disaster management council)	Establishing 'outline of emergency measures action against Tokyo inland earthquakes'
2007.6	CAO (central disaster management council)	Establishing 'BCP guidelines on the central government ministries and agencies'
2008.12	CAO (central disaster management council)	BCP completion in case of selected public institutions
2010.4	CAO · FDMA	Establishing 'BCP guidance on the local public organization at the time of earthquake disaster and its explanation'
2011.3	Great east Japan earthquake (M 9.1)	19,418 victims

4. Comparative Analysis of Administrative BCP in Large Cities in Japan

Among the cases of administrative BCP in Japan, the cases of Tokyo, the representative metropolitan area of East Japan, and Osaka Prefecture, the representative metropolitan area of Western Japan, were analyzed. These two urban areas are representative urban areas in the east and west of Japan. Tokyo has experienced the Great East Japan Earthquake and is preparing for a future metropolitan earthquake. Osaka Prefecture experienced the Great Kobe Earthquake and is a key metropolitan area in preparation for the future Great Nankai Trough Earthquake.

The above two cases are significant in that they are a representative metropolitan area in Japan, and the administrative BCP was established based on the experiences of earthquake damage and lessons learned. Table 1 is a comparison of the current status of Tokyo and Osaka Prefectures.

This chapter compares and analyzes the major issues of the Tokyo Metropolitan Government and Osaka Prefecture's administrative BCP according to the three perspectives presented in Chapter 2.

4.1. Tokyo

The Tokyo Metropolitan Government's BCP was established in November 2008. After that, it was revised in December 2017 based on lessons from the Great East Japan Earthquake. The main contents are precautionary measures to maintain the function as the capital of Japan from the damage of the capital earthquake, which is predicted to occur with a probability of about 70% within the next 30 years, and to continue administrative work in case of emergency[20].

4.1.1. Measures in case of damage to the administration

The Tokyo BCP considered the absence due to the injuries of the employees and the circumstances of the employees who must be mobilized in the event of a disaster. In the event of an earthquake of magnitude 6 or more, mobilization is performed differentially according to the employee's residence area and the usual duties. When an earthquake occurs at night and on holidays, mobilization targets are divided into four stages, and the number of necessary staff and tasks to be in charge have been set in advance. For example, the first mobilization target is about 22,500 employees whose residence is within 10km in a straight line from the place of work and is in charge of unique emergency countermeasures. They arrive at their organization as quickly as possible after the earthquake and are responsible for the makeup work of the relevant department. In addition, it is emphasized that the disaster prevention center, which is the core business unit for disaster response, should determine and inspect alternative facilities in advance in case the function is lost.

Table 2. Present comparison of conditions between Tokyo and Osaka[19].

Subject	Tokyo metropolis	Osaka prefecture
Population	about 13,784,000 people	About 8,819,000 people
The gross area	2,194 km2	1,905 km2
GRDP	1.6 trillion USD	443.5 billion USD
	GRDP19.6 % of Japan	7.3 % of Japan
Major earthquake damage	7 victims 116 injuries (2011 great east Japan earthquake)	31 victims 3,589 injuries (1995 great han-shin awaji earthquake)
Estimated earthquake damage**	5,638 vittims by by Tokyo inland earthquake	133,891 victims by nankai trough megathrust earthquake

Note: *Gross regional product as of 2015, building collapse includes partial collapse.

**Maximum damage level(if no disaster prevention measures are taken, etc.).

4.1.2. Establishment plan of core tasks according to priorities

The important tasks according to priority were set based on the Tokyo Port Northern Earthquake, which was the most predicted damage to Tokyo among the damage predictions announced at the Tokyo Metropolitan Disaster Prevention Conference in 2012. Important tasks are categorized into six types based on task arrangement by target time of task commencement. These are the duties of the headquarter, the common duties of each department, the protection of the lives and lives of residents, and the protection of property, the maintenance of the lifeline, the maintenance of the infrastructure, and other duties. In particular, prior to the Great East Japan Earthquake, tasks to be initiated were organized by time slot, but tasks that should be intensively resolved within 3 hours after the disaster were not established, making it difficult to respond to the first response, and support from other local governments was also hindered. As a result of this, the revised Tokyo Metropolitan Administrative BCP

has been structured so that initial response can be accelerated by focusing on establishing a disaster countermeasure system and supporting rescue and first aid activities, which should be undertaken within 3 hours after the disaster[21].

4.1.3. Measures to resolve the specificity of business performance in the event of a disaster

After the earthquake, work was carried out in a 24-hour emergency system for early recovery and quick normalization of disasters. The Tokyo Metropolitan Government BCP has specifically prepared plans for rotation work and maintaining the health of employees. For example, in a three-shift rotation, it is recommended to take a 1 hour break while working for 8 hours and 45 minutes. In addition, the last 45 minutes of work took over the work that was in charge of the next worker and transferred know-how. Specifically, the first half of the business is from 9:00 to 17:45, the second half of the business is from 17:00 to 25:45, and the third half of the business is from 25:00 to 9:45. Two employees, taking 45 minute shifts, were allowed to work together. In addition, taking into account the difficulty of returning home and waiting for work due to traffic paralysis among the staff, each department had to pre-determine a resting space in the office building.

It is noteworthy that an agreement has been signed that considers support through dispatched service from other supporters. In the event of the Great East Japan Earthquake, we received support from staff from other local governments, but taking advantage of the lessons that could not be fully responded to because it was a simple dispatch, the agreement was concluded by dividing the structure and contents of support from other local governments into five categories: nationwide, 21 large cities, and government offices. Regarding this, briefing sessions were held with local governments in Tokyo to avoid confusion in case of emergency. In addition, central training was conducted to improve employees' awareness of disaster prevention, and integrated cross-disciplinary education and training between departments, such as two hours of work proficiency training after a disaster, was conducted.

4.2. Osaka prefecture

The administrative BCP of Osaka Prefecture was established in June 2009, and after the Great East Japan Earthquake, it has undergone several revisions based on the mitigation of the Nankai Trough Earthquake. In February 2017, some revisions were made to reflect the lessons learned from the 2016 Kumamoto Earthquake and the changes in available business resources following the completion of the 2016 government building seismic renovation work. It contains measures to continue administrative work from possible damages such as the Nankai Trough Earthquake that may occur in the future[22].

4.2.1. Measures in case of damage to the administration

The Osaka Prefecture BCP is taking measures in consideration of administrative damage, such as injuries to employees who were working in the government building due to a disaster occurring within working hours. The proportion of employees who are difficult to continue their work due to injuries was set by applying the case of the Kobe earthquake. First of all, the required manpower for core work was divided into six stages. Specifically, in the event of the Nankai Trough Earthquake, 1,088 manpower required, but 2,286 manpower available for recruitment, it is expected that there will be no major problem in securing the overall manpower. The important thing is to consider the possibility that there will be a small number of employees in each department, and immediately support the rescue of the affected employee than the administrative work among the uninjured employees, and even if there are no visible injuries among the employees, the work will be disrupted by mental pain. It is instructed to take into account that this may occur.

4.2.2. Establishment plan of core tasks according to priorities

Important tasks according to priority are divided into disaster emergency countermeasure tasks and high-priority normal tasks and are carried out in six stages depending on the period of occurrence. In

step 1, the task is up to 3 hours after the disaster, and the disaster emergency countermeasure task specifically instructs the establishment of a quick disaster prevention regimen, reliably conveys evacuation information to the local residents, and gives priority to rescue requests to support organizations. In normal work, the administrative functions of Osaka Prefecture are instructed to continue socially uninterrupted work even in the event of a disaster.

The important thing here is that detailed work details have been prepared for each step, and there are a total of 85 types of disaster emergency countermeasure tasks in step 1, including the establishment of a disaster countermeasure headquarters and user safety checks at the relevant facilities.

The initial task was divided into three categories: staff, government building power, and information and communication facilities. This is to ensure that there is no confusion in command management and total cooperation in the event of a disaster.

The resources and environment for continuing work were categorized into six categories: employee, power, government building damage, information and communication facility damage, office environment, and logistics so that you can prepare from the usual time. It is also characterized by a distinction between items that can be checked in normal times and items that can be done in emergencie.

Table 3. Comparison between Tokyo and Osaka BCP[19].

Section	Tokyo	Osaka
Establishment date of BCP	November 2011	June 2009
Last revision date of BCP	December 2017	February 2017
Main countermeasure for administrative resources damage	• Mobilization according to residential district and responsibilities in case of an earthquake of seismic intensity six occurring • Implementing mobilization in four phases in case of an earthquake occurring at night and during holidays • Checking facilities and preparing alternatives in case of damage to the disaster control center	• Setting six phases for required manpower to carry out core tasks • Setting human damage rates according to lessons from the great han-shin awaji earthquake • Preparing lack of manpower by individual departments
Setting priority of core tasks	• Six classifications of each bureau's tasks • Adding main focus tasks within three hours for emergency responses according to lessons from the great east Japan earthquake	• Two classifications of main core tasks and implementing six phases according to the time of disaster occurrence • Three classifications of emergency tasks for seeking cooperation from all departments and bureaus in an office building • Six classifications of tasks of resources and environments for checking advance preparation
Main countermeasure for conduction of business	• Encouraging one hour's rest time after eight hours and 45 minute's work • 45 minute's cooperation time before and after exchanging tasks • Preparing a rest area for staff waiting for workers who cannot return home • Five classifications of cooperation agreements with another local government according to lessons from the great east Japan earthquake	• Preparing measures for meals and physiological phenomenon such as toilet use at an appropriate place and usable time for staff • Preparing safety confirmation for staff concentrating on tasks • Assigning four responsible bureaus and departments for logistics and management after mobilization

The important thing is that the employee awareness-raising activity was placed at the very beginning of the usual measures to be taken. Employee training is planned, and not only mobilization training, but also training that collects personal damage information in the personnel department after safety verification is performed. Priority items are instructed to be prepared and possessed in advance.

4.2.3. Measures to resolve the specificity of business performance in case of disaster

The Osaka Prefecture BCP systematically assigned logistics for employees who need to focus on handling disasters. In particular, the number of meals and drinks for three days, as well as the period and place of use of toilets in the government building, depending on the degree of damage in case of a disaster, were specified. It also states that employees are the most important work resources, and emphasizes that securing their safety and verifying the safety of their families are very important in carrying out administrative BCP[23][24]. Therefore, in the event of a disaster during working hours, it is instructed to devise a plan in advance, such as using the Osaka disaster prevention information text message to confirm the safety of the employee's family so that employees can concentrate on their work with confidence. In particular, to quickly secure staff to perform tasks in the event of a disaster, measures were not prepared only for each department, but measures were divided into logistics in charge of each department, personnel bureau of Osaka Prefectural Office, personnel bureau of the crisis management office, and government building management division[25][26]. Therefore, even after securing manpower, it was possible to manage logistic and work allocation[27].

5. Conclusion and Implications

Recently, attention has been raised nationwide due to the large-scale earthquake that has occurred in succession in Korea, and the establishment of a functional continuity plan has become mandatory due to the revision of the Basic Act on Disaster and Safety Management. This study examined the characteristics of the plans of Tokyo and Osaka Prefecture, Japan's representative cities that promoted the administrative BCP.

To summarize the characteristics of the administrative BCPs of Tokyo and Osaka Prefecture, they considered what they should do and what they can do while preparing a countermeasure for the upcoming disaster. It is also significant that it was not only aimed at putting such concerns into a plan but also considered a plan that can be put into practice in everyday life. It was made clear that disaster response was not the responsibility of some ministries by collectively sharing the work to be done by departments in the government office. In addition, to continue administrative functions in the event of a disaster, prepare a plan for contacting the family's safety for employees, order a one-hour break during work, and in the last 45 minutes of a work shift, work with the predecessor to learn about new information and situations. The way to reduce the burden of understanding can be said to be human consideration for employees who perform work even in the event of a disaster.

In this paper, we looked at three perspectives necessary for the introduction of administrative BCP, considering administrative damage, core tasks according to priorities, and specificity of task performance. In the end, it is important to come up with an optimal idea for the above three perspectives by thinking a lot about the unique situation of the local government's employees and departments, what they should do, and what they can do. Lastly, the BCP of the administration of Tokyo and Osaka Prefecture in Japan suggests to us as follows.

First, it is necessary to devise a plan that does not disrupt business performance in consideration of administrative damage. In addition, since human resources are people, it is necessary to reduce the burden of work and increase efficiency through maximum consideration.

Second, after selecting the core tasks according to the priorities, it is necessary to consider a plan that can be practiced in normal times by cultivating disaster prevention awareness through training or training.

Third, agreements should be made in advance not only with all departments in the government building, but also with other local governments in some cases, minimizing the confusion caused by the inflow of external resources in the event of a disaster, and receiving effective support.

As we are in the early stages of introducing administrative BCP, we may need to make useful plans by referring to Japanese cases.

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7. Appendix

7.1. Authors contribution

	Initial name	Contribution
Lead Author	JC	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑
Corresponding Author*	CC	-Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑
Co-Author	DL	-Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑

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The NLP Program Development of Intrapersonal Intelligence Enhancement for the COVID-19 Crisis Management and the Analysis of Its Effect

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Abstract

Purpose: *Following the COVID-19 crisis, the solidarity among people in our society has discontinued and activity restrictions have increased, and as a result, mental stress has risen significantly. Such a global pandemic crisis has prolonged despite numerous efforts have been made at the national level to address it. Therefore, along with the national crisis management, the need for a professional education program for enhancing the mental health of individuals has been called for. Accordingly, in this paper, as a method of the consciousness training for overcoming the pandemic, an education program was designed and executed to increase the intrapersonal intelligence, thereby demonstrating the effect of the education.*

Method: *As a program to enhance the intrapersonal intelligence, pre-class was operated to minimize face-to-face classes for the short term in consideration of the pandemic situation. Towards this end, a program was designed with the teaching and learning structure of Flipped Learning to maximize the effect and efficiency of education. The program's curriculum was developed into 10 sessions for adult learners, and a social media platform was utilized to operate the pre-class. Furthermore, the NLP coaching tool was used as a main teaching method for the program. In addition, to examine and validate the effect of the program, the corresponding sample t-test was conducted, while the educational effect was measured via the pre- and post-comparative validation between the experimental group and the control group.*

Results: *As a result of executing the intrapersonal intelligence improvement program and conducting the pre- and post-tests, there was a significant difference in the scores for the entire intrapersonal intelligence test. The positive result of this program is analyzed to be a result of the systematic teaching design. Along with which, it may be interpreted as a result of enhancing the understanding of the self-reflection, immersion for learning, and the motivation for learning by undertaking the Flipped Learning based class strategies satisfying the needs of the 21st century learners.*

Conclusion: *Moving forward, disasters and crises following the changes in the climate environment and industrial advancements are expected to continue in our society. Accordingly, a professional emotional management program which can help learners cope with the crisis situation should be in place. Moreover, the teaching and learning method and the operating system in a contactless situation should evolve as well. In this point of view, unlike the existing studies, this study has achieved distinction by reflecting educational elements satisfying the needs of the times and performing innovative teaching methods.*

[Keywords] ***Intrapersonal Intelligence, Flipped Learning, NLP Coaching, Program Design, Instructional Design***

1. Introduction

In the current era, since the digital transformation has accelerated, the convergence of digital technology and the information and communication became a norm, while the dividing force which has led changes for the past millennia is being replaced by the convergent force. Meanwhile, the entire

mankind is preparing unprecedented countermeasures after experiencing pandemic disasters which could not be predicted[1]. For the future society taken in the background of the times like this, creative problem solving skills, human sensibilities, and healthy and stable emotions have become ever more crucial[2].

Recently, the COVID-19 disaster facing the world has caused serious social issues in the area of individual life and in the context of nation as time elapses[3]. The COVID-19 crisis is intensifying the Corona blue, increasing the mental stress as the solidarity among people has discontinued, while activity restrictions have increased as all circumstances in the society have changed so rapidly[4]. Corona blue is a term of the combination of “COVID-19” and “blue,” and the expansion of the Coronavirus is causing helplessness in the people's daily lives. Furthermore, as they experience the pandemic caused by the COVID-19, many are feeling anxious and fearful. In this connection, Korea is preparing international public health emergency countermeasures[5]. However, despite the efforts made at the national level, the COVID-19 pandemic is turning long-term. Given this prospect, a professional educational program for emotional management is needed to strengthen the individual's mentality first in terms of the personal quarantine.

In crisis situations, men need to elevate their consciousness and restore their self-esteem to protect themselves. In particular, the consciousness training to elevate the self-consciousness of modern people is required, since it has been lowered by the pandemic. Furthermore, our society needs to establish the individual's identity and strengthen the mental immune system. Such a demand, that is, it requires a new level of ability and skills to accurately understand oneself, control one’s emotions, and erect oneself. Such capability may be represented by the “intrapersonal intelligence” at a new level of intelligence. Intrapersonal intelligence is a kind of multiple intelligence, which literally is based on how well one knows oneself and can reflect on and introspect oneself. That is, the intrapersonal intelligence involves the emotional and behavioral regulation based on the awareness of one's abilities and skills, capability to control and develop abilities and skills, and the one's future. Furthermore, the intrapersonal intelligence is a basic driver which activates all the intelligence related abilities and skills, and is also a representative intelligence which oversees the introspection of “who I am”[6]. Such intrapersonal intelligence is essentially needed in forming a realistic self-concept and in planning a better life experience in such a chaotic society as the pandemic era. Therefore, intrapersonal intelligence is a capability which is desperately required of all of us living through the present time[2].

However, most of the modern people consume their energies in satisfying basic living conditions by staying conscious of the environment in their family, organization, and society. In order for men to ultimately live a perfect life, they must elevate their level of consciousness. Consciousness includes all the activities called human knowledge, emotions and willpower. Furthermore, consciousness includes the function to intuit the surroundings, function to predict the future and set goals to make and decide plan for actions, as well as the evaluation function to determine the code of conduct, setting of values, and the correct intention of the purpose of actions. As such, consciousness plays a role as an institution which controls the complex social life and transforms the material world in a practical manner. Consequently, to elevate the awareness, one needs to develop self-reflection skills. Accordingly, the modern people will be able to grow their consciousness even amidst crisis if they establish correct beliefs and values via a systematic development program for intrapersonal intelligence and positively establish the attitude of life.

The program for enhancing the self-reflection ability and skills is conducted in various forms. However, most of the types of professional counseling programs are operated for the purpose of spiritual development of a specific religion or psychotherapy. Therefore, it is necessary to develop a general purposed intrapersonal intelligence improvement program allowing the general public to participate for the purpose of purely cultivating consciousness.

To develop the intrapersonal intelligence improvement program, it is necessary to select educational contents satisfying the needs of the times and differentiate educational methods. Among which, the first to consider is the process of systematizing the main areas and the sub elements of intrapersonal intelligence comprising the educational contents. To this end, the basic components of the intrapersonal intelligence were derived based on the previous studies[2]. Subsequently, in terms

of operating the intrapersonal intelligence improvement program, it was designed as the Flipped Learning structure by which the contactless and face-to-face are blended in consideration of the COVID-19 situation and the changing educational environment and the learners' requirements[7][8][9]. Furthermore, the NLP coaching technique, a non-instructional teaching method, has been applied for the major teaching method.

In reality, efforts for individual consciousness growth have limitations. This is because there is a lack of professional knowledge and experience, and a lot of cost and time is invested. So many people cannot easily experience education about consciousness growth. For that reason, in this paper, we developed a high-quality educational curriculum in a relatively short time and applied an innovative teaching method for the efficient operation of education. Existing curriculums were operated only with general counseling techniques or coaching techniques. However, this study provided non-face-to-face education in advance in consideration of the limited environmental conditions in the pandemic era. In addition, even when face-to-face training is ended, it is designed to be able to always coach using the SNS platform. The design and development of such a systematic curriculum will make this thesis stand out from other studies and become an original idea.

The purpose of this study is to develop an educational program for the purpose of improving the intrapersonal intelligence under a crisis situation and demonstrate its effect. As a tool to this end, the purpose is to validate the effect of the program by applying the NLP coaching technique based on the Flipped Learning. The research questions set to achieve the purpose of this study are as follows.

First, how is the NLP program for the intrapersonal intelligence improvement structured and developed for the COVID-19 crisis management?

Second, is the NLP program for the intrapersonal intelligence improvement effective for improving the intrapersonal intelligence for the COVID-19 crisis management?

2. Theoretical Background

2.1. Intrapersonal intelligence

The intrapersonal intelligence, which needs to be dealt with in this paper, is an area of the multiple intelligence theory. The person who proposed the concept of multiple intelligence was Gardner(1983), who criticized the existing concept of intelligence and created a new concept of intelligence, which turned out to be the origin of multiple intelligence[10]. Gardner expanded the area of new intelligence and redefined intelligence beyond the traditional concept of intelligence centered on languages and the logic and mathematical abilities and skills. Furthermore, he introduced a new perspective on cognitive intelligence, while criticizing the concept and measurement of the traditional intelligence which does not include or measure the abilities and skills valued in the real world outside of school. To differentiate it from the existing concept of intelligence, it was called multiple intelligence, and this concept has been widely applied from the child to adult education[11][12][13].

Gardner's multiple theory is divided into 8 areas. Divided into 8 areas are linguistic intelligence, logical and mathematical intelligence, musical intelligence, spatial intelligence, physical intelligence, natural intelligence, interpersonal intelligence, and intrapersonal intelligence. Of which, the intrapersonal intelligence is literally one based on how well one knows oneself and can reflect on oneself[14]. Furthermore, the intrapersonal intelligence was defined as “the ability and skills to impact the distinction between one's own emotions or ranges of affection, and ultimately name and use them as a means of understanding behaviors by using the symbolic codes.” It also explains that, the people with exceptional intrapersonal intelligence have a healthy behavioral model for their own, well identify their feelings, goals, fears, strengths and weaknesses, and know how to use such models in the circumstances where it is good to make wise decisions for life[15]. In addition, self-reflection intelligence acts as a core intelligence that enhances the effectiveness of learning[16][17].

In fact, the type of person with a high intrapersonal intelligence will have a high level of satisfaction with their work, and will exercise their problem solving ability and skills even as they face undesired

circumstances, and will achieve the intended results. Whereas, as for the people with a low level of intrapersonal intelligence, they would not be able to highlight their strengths given their lack of understanding, and would also not be able to make a full use of their internal resources. Furthermore, no matter how good the environment and conditions, they would not realize what they have, and would likely live a life of dissatisfaction. As such, the intrapersonal intelligence is determined to be a most basic and important intelligence which men must have for their happy lives. After all, the key to leading a happy life by maximizing one's own internal resources in such fast changing time of transition will depend on the intrapersonal intelligence.

2.2. NLP

The Neuro Linguistic Programming(NLP) is “a theory and coaching technique which systematically and scientifically rolled out the method of understanding and transforming the structure of human experience which receives and experiences external information through the five senses”[18]. NLP is an abbreviation of Neurology, Linguistics, and Programming, which is the design process of the conscious and unconscious patterns with which men constantly move towards their high potential in their own unique ways, and with which they study thoughts, languages, and behavioral patterns.

When specified, N of NLP refers to the neuro, yet it also refers to our mind. This means that all of the men’s actions have a neural basis. For instance, through the functioning of the five senses including sight, hearing, smell, taste, and touch, the information from the outside is received and meaning is attached thereto. Further to which, men act according to each meaning. Now, L stands for linguistic, which includes language based on non-verbal messages in addition to the spoken language and words[19]. This language is used as a tool to elicit the people's actions and communicate with others, while reflecting the world of mentality such as human thoughts, beliefs, and attitude. Hence, listening to the language spoken by a person tells you something to some extent about the inner world of that person. Lastly, P is programming, which is a computer term and which means that human thoughts, emotions, and actions are habitually programmed[20].

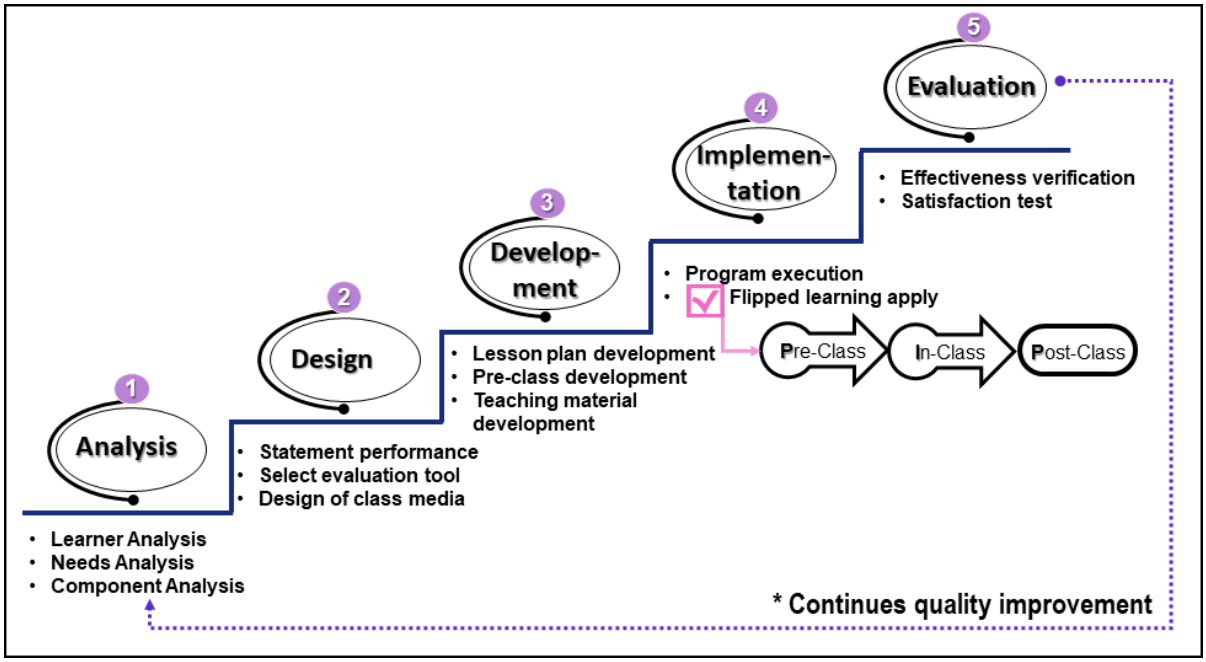
This indicates that just as a program can be changed by upgrading a computer's software, one’s thoughts, emotions, and behaviors can be changed by upgrading human's inner mental software. Consequently, it may be interpreted that only after men experience the world explained or defined by language through the organs of five senses, and whether consciously or unconsciously perceive the information from the outside in a specific way, can they take specific actions. This is why we believe that through NLP, the human mind and behavior can be changed from the negative to the positive consciousness. NLP is effectively used as a coaching tool in various fields[21][22][23].

3. Research Method

3.1. Program development course

The basic research design of this work is to identify the components of introspection intelligence to establish training objectives. Next, follow the procedures of ADDIE to reasonably implement program development activities[24]. The final developed program was reviewed by Ph.D. in educational engineering and five NLP coaching experts to verify reliability and feasibility. And <Figure 1> shows the process of developing an NLP program for improving self-reflection intelligence.

Figure 1. Intrapersonal intelligence enhancement NLP program development procedure.

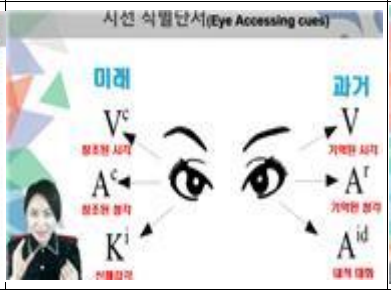


To further explain the picture, the PIP stage of Flipped Learning was carried out in the class execution stage. At this time, it is important to keep in mind that if the ADDIE model refers to the overall stage of program development, Flipped Learning is composed of a stage that provides pre-learning in the course of class development, uses NLP coaching in the classroom, and reflects in the post-learning. In addition, digital literacy of instructors is required to operate smooth flipped learning[25].

3.2. Program operation and effectiveness verification

The subjects of this study was composed of adult learners proportion of men 10 patients(66.7%), five female patients(33.3%) and the mean age was 46.5 years. Trainees usually recruited those interested in coaching, self-development, and self-reflection. In addition, it was announced in advance that the learning platform will be used for pre-learning, and the instructor operated a pre-class.

Figure 2. Providing pre-learning for each session.

‘Self-understanding’ 1st, 2nd, 3rd	‘Self-regulation’ 7th, 8th, 9th, 10th	‘Self-design’ 4th, 5th, 6th
		

The operating period of this program was conducted over a total of 4 days from April 27, 2021 to April 30, and the actual program operation session consisted of a total of 10 sessions. In the education, all prior learning was conducted at the same time, and in face-to-face classes, coaching practice was mainly operated. In addition, a questionnaire tool to measure self-reflection intelligence was used to

analyze the effectiveness of the program[14]. The questionnaire composition of the questionnaire tool by factor was composed of 10 self-understanding, 13 self-regulation, and 14 self-design. In addition, the effectiveness analysis of the program examined the improvement score of the overall self-reflection intelligence and the degree of improvement of the score for each sub-factor. To this end, the average and standard deviation of pre-scores and post-scores of self-reflection intelligence were calculated, and a Paired Sample t-test was conducted. The data collected for statistical processing were Windows SPSS 25 program.

4. Program Development

In order to develop an NLP program for improving self-reflection intelligence, it is necessary to construct what and how to educate and support learners. In this regard, the constituent factors of the self-reflection intelligence improvement program were designed based on previous studies. As a specific content, as shown in <Table 1>, it was set as 3 areas and 6 factors to include all the elements of self-reflection intelligence.

Table 1. Components of intrapersonal intelligence.

Components	Definition	Sub factors	Definition
Self-understanding	The ability to awareness of self-emotions and ability to utilize emotions	Self-emotional understanding	The ability to understand and use one's emotions
		Understanding ability	The ability to recognize one's own abilities
Self-regulation	The ability to control emotion and behavior according to situational judgment	Situation control	Judgment ability to control behavior according to the situation
		Impulse control	Impulse control ability to regulate emotions and behavior
Self-design	The ability to set your own goals and synchronize to achieve them	Future design	The ability to plan your own goals
		Motivation for achievement	Motivational ability to achieve goals

To improve self-reflection intelligence, which was finally devised, the NLP program was developed in a total of 10 sessions based on the constituent factors. In connection with it, the contents calculated for each element were also revised and supplemented within the range of 1.00 Content Validity Ratio(CVR) in order to verify the validity of the program. The sub-goals, instructional methods, and details for each session of the finally developed program are as shown in the following <Table 2>.

Table 2. Intrapersonal intelligence enhancement NLP program session content.

no.	components	Session name	NLP program	Session objective
1	Self-understanding	What style do I have is it?	Observation identification	Eye accessing cues
				Confirmation of preferred representation system
2		Finding the real me in me	Finding the source of conviction	Understanding the variety of your inner self

3		Switching the negative behavior	Step 6 reframing	Changing the meaning of the action you want to correct in 6 steps
4	Self-regulation	Freeing the disturbers inside me	Integration of negative and positive	Integrating negative beliefs into positives
5		Future achievement experience	Time line	Strengthen your faith by feeling that your dreams have come true in the future through the time line
6		Anchor the mind	Anchoring	Planting a good stimulus in my mind
7		I am a precious person	Praise	Receive praise from those who support me
8	Self-design	8 kinds of questions that make my dream come true	8 frame outcome	Environmental inspections and establish an action plan to achieve their dreams
9		Challenge for your dream	Chunking up & down	Chunking an action plan to achieve your dreams
10		Finding confidence	Circle of excellence	Reminding yourself of the happy moments of the past to gain confidence

5. Program Effect

Intrapersonal Intelligence improvement NLP program A response sample t-test was conducted to determine the difference between the intelligence score before education and the intelligence score after education. As a result, as shown in <Table 3>, t=-6.786, p=0.000 were statistically significant based on the significance level of 0.001.

Therefore, It can be said that there is a difference between the intelligence score before education and the intelligence score after education in the Intrapersonal intelligence improvement NLP program. The pre-educational Intrapersonal Intelligence intelligence score was an average of 3.79 points out of 5 points, while the self-reflection intelligence score after education rose by 0.39 points to an average of 4.18 points. Therefore, the actual Intrapersonal Intelligence enhancement NLP program is judged to be an effective education for enhancing self-reflection ability.

Table 3. Intrapersonal intelligence NLP program effect analysis.

Division		Technical statistics			t(p)
		N	M	SD	
Self-reflection intelligence improvement NLP program education evaluation score	Before education	15	3.79	.328	-6.786 (0.000)***
	After education	15	4.18	.366	

Note: *p<.05, **p<.01, ***p<.001.

Next, the effect of the sub-factors of Intrapersonal Intelligence was further analyzed. As a result, it was confirmed that the post score was measured higher than the pre score for all of the sub-factors, indicating statistically significant results. Specifically, the results of the correspondence sample t-test

to confirm the difference in the scores of each sub-factor of Intrapersonal Intelligence are as follows. First, as for the sub-factors of self-understanding, the pre-score was 3.70 and the post-score was 4.20. As a result, t=-9.057, p=0.000 showed statistically significant differences based on the significance level of 0.001. As for the sub-factor of self-regulation, the pre-score was 3.90 points and the post-score was 4.20. As a result, t=-4.423, p=0.001 showed a statistically significant difference based on the significance level of 0.001. Next, as for the sub-factor of self-regulation, the pre-score was 3.90 points and the post-score was 4.20. As a result, t=-4.423, p=0.001 showed a statistically significant difference based on the significance level of 0.001. Lastly, for the self-designed sub-factor, the pre-score was 3.71 points and the post-score was 4.14 points. As a result, t=-6.177, p=0.000 showed a statistically significant difference based on the significance level of 0.001.

As a result, these results show that the Intrapersonal Intelligence of those who participated in the Intrapersonal Intelligence improvement program increased all of the sub-factors of Intrapersonal Intelligence after participation compared to before participating in the program. Therefore, it can be seen that the NLP program for improving Intrapersonal Intelligence has a positive effect on improving Intrapersonal Intelligence.

Table 4. Intrapersonal intelligence NLP program sub-factor effect analysis.

Division		Technical statistics			t(p)
		N	M	SD	
Self-understanding	Before education	15	3.70	.464	-6.786 (0.000)***
	After education	15	4.20	.462	
Self-regulation	Before education	15	3.90	.287	-4.423 (0.001)***
	After education	15	4.20	.359	
Self-design	Before education	15	3.71	.432	-6.177 (0.000)***
	After education	15	4.14	.462	

Note: *p<.05, **p<.01,***p<.001.

6. Conclusion and Recommendation

In this study, the Flipped Learning NLP coaching tool was applied to improve the intrapersonal intelligence. In this connection, the conclusion based on the result of the research issues may be presented as follows.

First, the NLP program for the intrapersonal intelligence improvement developed in this study has been designed via a valid development process in line with the systematic instructional design. The constituent factors of the program developed in this study reflect the analytical results of the previous studies, and “self understanding,” “self regulation,” and “self design” were selected based on the intrapersonal intelligence factor area. The entire curriculum has been consisted of 10 sessions, and one-on-one peer coaching was carried out to pursue a complete learning. Furthermore, it was determined that a learner centric practical learning was needed far more than a lecture style, and hence, the educational environment and educational method have been operated with elasticity in connection with motivation and the immersion for learning.

Second, the NLP program for the intrapersonal intelligence improvement developed in this study is effective for improving the intrapersonal intelligence. In this study was carried out a quantitative analysis to examine and validate as to whether the intrapersonal intelligence improvement program was effective. Consequently, it was possible to verify significant values of the pre-score and post-score for

the entire intrapersonal intelligence. Moreover, as a result of comparing the pre-score and post-score for each component of the intrapersonal intelligence, all 6 factors of the 3 areas were discovered to yield significant results. Therefore, the “NLP program for the intrapersonal intelligence improvement” developed in this study has demonstrated to be effective.

Lastly, based on the results of this study, recommendations for the future study are as follows.

First, concerning the educational operation, the pre-learning platform developed and operated in this study does not operate the Learning Management System(LMS) equipped with specialized functions. The LMS records the learner's learning process and also performs the function of providing support for customized learning, yet it was restricted in this study. To maximize the efficiency of the future program, operating a specialized LMS installing and managing pre-earning is required.

Second, this study has been carried out in a specific area, and has also focused primarily on the adult learners. Hence, it is difficult to generalize the results of the study. Meanwhile, given the unique nature of the constituent factors of the intrapersonal intelligence, it may have significant meaning for the adolescents. Adolescence is an important period in which beliefs and values are formed, and hence, efforts to elevate the intrapersonal intelligence are needed. Therefore, the follow-up studies in the future will need to demonstrate their effectiveness by operating programs targeting the adolescents. Furthermore, to measure the intrapersonal intelligence in a greater depth, it is expected that a scale development research appropriate for the subject matter will be conducted in tandem.

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8. Appendix

8.1. Authors contribution

	Initial name	Contribution
Author	JC	-Set of concepts ☑ -Design ☑ -Getting results ☑ -Analysis ☑ -Make a significant contribution to collection ☑ -Final approval of the paper ☑ -Corresponding ☑ -Play a decisive role in modification ☑ -Significant contributions to concepts, designs, practices, analysis and interpretation of data ☑ -Participants in Drafting and Revising Papers ☑ -Someone who can explain all aspects of the paper ☑