

# PUBLIC OPINION ON DESIGNATION OF KOREA DMZ AS UNESCO BIOSPHERE RESERVE

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**ABSTRACT:** The Korean Demilitarized Zone (DMZ), which is home to numerous rare and endangered flora and fauna, has been protected from human interference and environmental disruption for almost 70 years. Several areas around the DMZ are designated as UNESCO Biosphere Reserves yet certain areas are not. This article hypothesized that there may be differences in the public opinion regarding the UNESCO Biosphere Reserves between the designated and non-designated DMZ areas. A survey of DMZ area residents was conducted to understand those differences. From July 26 to August 1, 2020, surveys were conducted with 410 residents in the DMZ area. Contrary to the initial hypothesis, there were no significant differences in the opinion or awareness in both areas. Both groups of residents cherished their natural environment and were positive towards protecting it through its designation as a UNESCO Biosphere Reserve. They also showed

a lot of similarities rather than differences in their opinion and awareness. Accordingly, factors other than residents' perception need to be explored to determine why certain areas around the DMZ are designated as UNESCO Biosphere Reserves while others are not. This article concludes that if residents in the DMZ area are given adequate information regarding UNESCO Biosphere Reserves, sustainable development will continue within designated areas and movement in support of designation as UNESCO Biosphere Reserves will likely occur in non-designated areas.

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*Keywords:* UNESCO Biosphere Reserve, DMZ, Korea, Designation, Public Opinion, Resident, Survey

## Introduction

The Korean Demilitarized Zone (DMZ) is a military buffer zone that spans approximately 250 km (156 miles) from east to west across the Korean peninsula. The DMZ was established after the Korean War to separate South and North Korea and comprises an area 2 km south and north of the military demarcation line. Military activity has been prohibited and civilian access has been strictly restricted in the DMZ since the Korean Armistice Agreement of 1953. With no human interference for almost 70 years, environmental pollution or degradation is negligible in the DMZ. As a result, the DMZ is home to a variety of protected, endangered, and rare species, making it one of the best well-conserved natural environments in the world (Paju Mayor, 1997).

As members of the SIS DMZ Eco Youth Club, the researchers have been exploring the natural environment within the western area of the DMZ and studying various biological conditions while learning to respect the biodiversity and ecological value of the DMZ by participating in research programme programs organized by the DMZ Ecology Research Institute. The designation of the DMZ border areas as the United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere

Reserves is environmentally and historically important to maintain the natural state of the DMZ.

UNESCO Biosphere Reserves were created to implement the Man and the Biosphere Programme (MAB) established in 1971 after the International Conference on Conservation of Biological Reserve held in 1968 by UNESCO. This program allows UNESCO to recognize outstanding terrestrial, coastal, or marine ecosystems around the world, seeking ways to reconcile human activity with the conservation of biodiversity through the sustainable use of natural resources (MAB Korea Committee, 2010).

The following seven regional areas in the Republic of Korea (South Korea) have been designated as UNESCO Biosphere Reserves: Seoraksan (Seorak Mountains), Gangwon-do in 1982; Jeju Island in 2002; Shinan Dadohae, an archipelago in Jeollanam-do in 2009; Gwangneung Forest, Gyeonggi-do in 2010; Gochang, Jeollabuk-do in 2013; and Suncheon, Jeollanam-do in 2018. The following areas surrounding the DMZ have been designated in 2019: Cheorwon, Hwacheon, Yanggu, Inje, and Goseong in Gangwon- do designated as the Gangwon Eco-Peace Biosphere Reserve; and Yeoncheon, Gyeonggi-

do designated as the Yeoncheon Imjin River Biosphere Reserve (MAB Korea Committee, 2010). At the time, some areas near the DMZ were excluded when applying for designation (Chang, M., 2019). The question of why not all but only certain areas around the DMZ border are designated as UNESCO Biosphere Reserves was thus raised.

For a site to be designated as a UNESCO Biosphere Reserve, the national government or the national MAB Committee, where appropriate, reviews the application for nomination. Once it is nominated as a candidate for designation, the International Coordinating Council of the MAB Programme evaluates the nominated site. Finally, if it is successful in the designation process, the area is internationally recognized as a UNESCO Biosphere Reserve (UNESCO, 2019).

According to the designation process, representatives of the local communities are required to participate in the application process (UNESCO, 2019). UNESCO respects the opinions of residents, and if the residents oppose, it is difficult to become a UNESCO Biosphere Reserve.<sup>1</sup> Hence, cooperation from the local community is necessary for a successful designation by UNESCO. In the case of Gochang, Jeollabuk-do, an information

session for residents was held in 2011 to gather the opinions of residents in 14 towns (eup and myeon) of Gochang, and a public hearing was held in 2012 (Park, J., 2013), resulting in the successful designation of Gochang in 2013. In the case of Yeoncheon, Gyeonggi-do, a “DMZ Residents Academy” was operated for three years from 2013 to 2015 to raise the awareness and promote the understanding of the residents while preparing for UNESCO Biosphere Reserve designation and UNESCO Global Geopark certification, resulting in the successful designation of the Yeoncheon Imjin River Biosphere Reserve in 2019 and the certification of the Hantan River UNESCO Global Geopark in 2020 (Shin, M., 2020).

This article assumed that there are differences in the public opinion regarding the UNESCO Biosphere Reserves and environmental conservation between the designated and non-designated DMZ areas. The survey of residents was conducted to assess the hypothesis that the perception of the residents of the designated areas will be more favourable towards designation of UNESCO Biosphere Reserves than residents of the non-designated areas.

## **Research methodology**

### Survey questionnaire

The survey questionnaire was created by referencing online resources (Beusable, 2018), and separate versions were made for designated and non-designated areas. The survey questions were reviewed and revised in response to the comments provided by the researchers at the DMZ Ecology Research Institute. Common topics covered include the basic demographic information of respondents and the respondents' understanding of the local natural environment and UNESCO. For designated areas, questions addressed the changes made since the designation; for non-designated areas, queries addressed the changes expected if the designation was achieved. The surveys focused on real, tangible changes that occurred after the designation in the designated areas and changes that residents expected to occur post-designation in the non-designated areas.

#### Survey area selection

The survey was conducted in both designated and non-designated areas around the DMZ. This area can also be divided into sectors specified as Civilian Control Zones (CCZ) and those that are not. CCZs are sectors specified by the South Korean government to protect the secrecy of military operations and installations in areas south of the DMZ. CCZs span about 5 to 10 km south of the DMZ and civilian movement is restricted within them. Civilian Control Lines

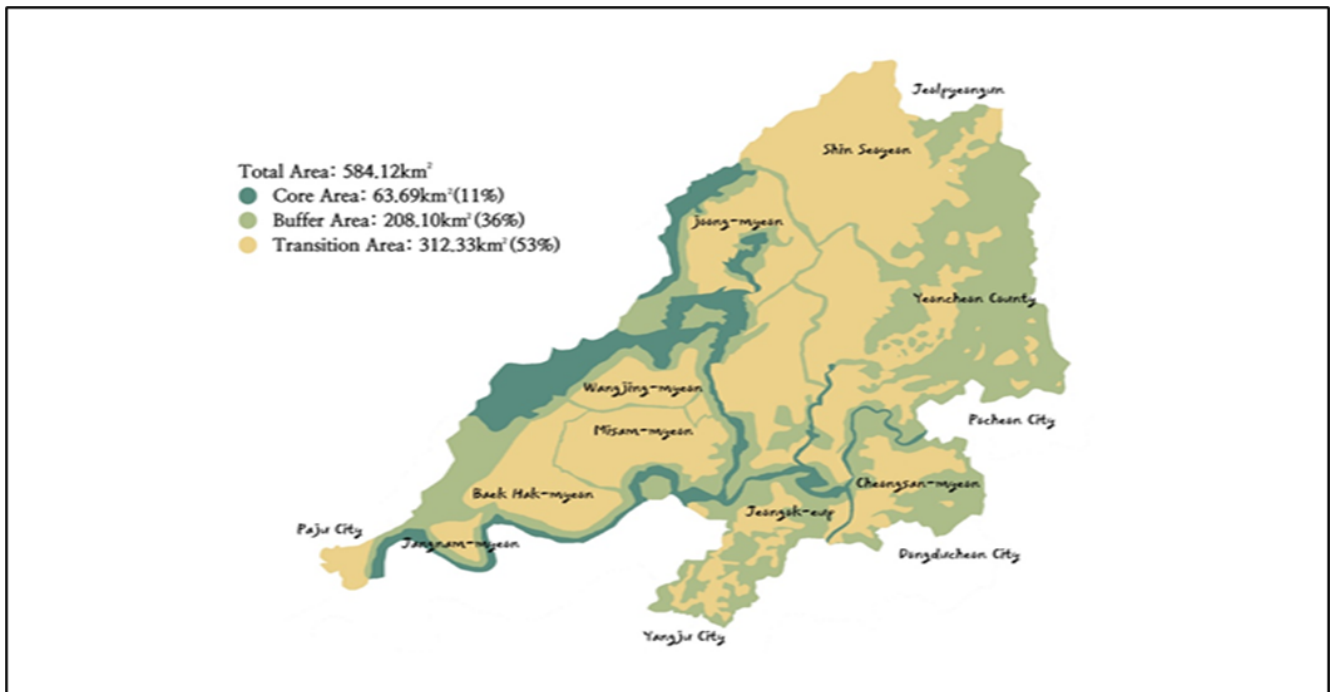
distinguish the CCZs from non-CCZ areas. Residents of towns within the CCZs in the Biosphere Reserve designated areas were surveyed; when CCZs could not be entered, towns that lay just beyond the Civilian Control Lines but within the Biosphere Reserve designated area were selected. For Paju City, which is a non-designated area, surveys focused on areas near the Imjin River as it functions as a Civilian Control Line.

Map No. 1 shows the surveyed areas in the Gangwon Eco-Peace Biosphere Reserve, which include Cheorwon County (Cheorwon, Dongsong, Galmal, Gimhwa, Seo, and Gunnam townships), Hwacheon County (Sangseo and Hwacheon townships), Yanggu County (Bangsan, Dong, Haean, and Nam townships), Inje County (Seohwa, Buk, and Inje township), and Goseong

County (Hyunnae, Geojin, and Gansung townships). Map No. 2. shows the surveyed areas in the Yeoncheon Imjin River Biosphere Reserve, which include Yeoncheon County (Gunnam, Jangnam, Baekhak, Wangjing, and Shinseo townships). For non-designated areas, residents in Paju City (Tanhyun, Moonsan, Juksung, and Papyong townships) were surveyed.



Map No. 1. Gangwon Eco-Peace Biosphere Reserve



Map No. 2. Yeoncheon Imjin River Biosphere Reserve

### Survey timeline

The survey was conducted between July 26 and August 1, 2020. Researchers travelled to the selected survey areas and surveyed residents who were willing to be surveyed. Surveys were conducted in person while adhering to COVID-19 social distancing and safety protocols applicable to South Korea during the survey period. Both the researcher and the survey participant wore masks during the surveys. As the DMZ area can at times be volatile due to the tensions between North and South Korea, researchers decided to conduct the survey in a compact seven-day period (Figure 1).

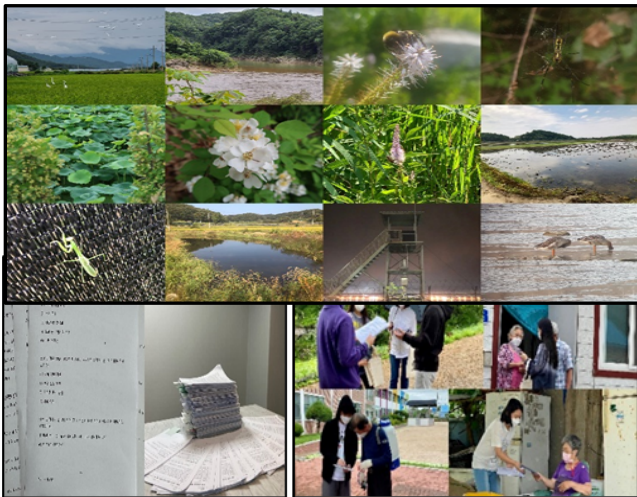


Figure No. 1. DMZ areas, survey questionnaires, and conducting resident survey

### Key consideration

The surveys were given only to residents in the

chosen areas. Prior to conducting the survey, researchers asked potential survey participants about their residential status. Non-residents and civil servants (law enforcement or township administration officers), who most likely rotate to different regions every few years, were excluded from the survey. To collect unbiased answers from the residents, researchers did not mention whether their town was within a UNESCO Biosphere Reserve. Researchers did not share details about the UNESCO Biosphere Reserve or the MAB programme before the surveys were completed, nor provide additional explanation regarding the survey and had the participants answer the questions as is. Researchers also did not steer respondents to any specific answers, nor offer biased information. If the participants were in a group, to minimize potential impact by peers, distance was maintained so that they could not discuss among themselves. If a participant had difficulty reading the questions, the researcher read the questions out loud to them independently. After participants submitted their completed surveys, researchers checked to see if all the questions were answered. If all questions were not answered, the researcher gave the survey back to the participant for completion. Any incomplete surveys were discarded.

Number of survey responses

For this article, more than 410 residents from the selected survey area were surveyed; 354 respondents from designated area, 56 respondents from non-designated area. The number of surveys to be completed were allocated proportionally to each county or city by their population. The minimum number of surveys for each county or city was set at 50. All the completed surveys were gathered from each selected region; a total of 410 completed surveys were returned. The number of surveys that were taken in each region are shown in Table 1.

Table No. 1. Surveys taken by region.

Category	Undesignated Area		Designated Area					Total
Survey Area (City/Gun)	Paju City	Cheomun-gun	Hwacheon-gun	Yanggu-gun	Inje-gun	Groong-gun	Yeoncheon-gun	410
Survey Area (Eup/Myeon)	Munsan-eup	Galmal-eup	Sangseo-myeon	Nam-myeon	Buk-myeon	Gaesaong-eup	Gunnam-myeon	
	Jeokseong-myeon	Geunnam-myeon		Dong-myeon	Seohwa-myeon	Geojin-eup	Sinseo-myeon	
	Tanhun-myeon	Gimhwa-eup	Bangsang-myeon	Inje-eup	Hyunnae-myeon	Wangjing-myeon		
	Papyeong-myeon	Dongsang-eup	Hwacheon-eup				Haean-myeon	Jangnam-myeon
	Geo-myeon							
		Cheomun-eup						
Survey Subjects (persons)	56	65	57	62	58	58	54	

Analysis of survey responses

The survey responses were analysed and the data was segmented by fields such as gender, age, level of education, and profession to find any trends and correlation. In cases where the respondents answered questions not relevant to

them, the responses were tallied as “not applicable.”

## Results

*Demographic results of survey respondents.* The demographic results of the total respondents in the designated and non-designated areas are as follows:

Table No. 2. Demographic results of survey respondents.

	Designated		Non-designated		Total	
	Number of Respondents	Percentage	Number of Respondents	Percentage	Number of Respondents	Percentage
<b>Gender</b>						
Man	155	44%	29	45%	184	45%
Woman	199	56%	27	55%	226	55%
Overall	354	100%	56	100%	410	100%
<b>Age</b>						
10s	26	7%	0	6%	26	6%
20s	20	6%	1	5%	21	5%
30s	28	8%	1	7%	29	7%
40s	41	12%	8	12%	49	12%
50s	65	18%	12	19%	77	19%
60s	79	22%	15	23%	94	23%
70s	95	27%	19	28%	114	28%
Overall	354	100%	56	100%	410	100%
<b>Education (Highest level completed)</b>						
Elementary school graduates or lower	103	29%	15	29%	118	29%
Middle or high school graduates	156	44%	30	45%	186	45%
College graduates or higher	95	27%	11	26%	106	26%
Overall	354	100%	56	100%	410	100%
<b>Occupation</b>						
Agriculture/ lives tock	79	22%	21	24%	100	24%
Company/ government employees	82	23%	9	22%	91	22%
Self-employed	46	13%	10	14%	56	14%
Housewives	34	10%	0	8%	34	8%
Students	63	18%	11	18%	74	18%
Others	50	14%	5	13%	55	13%
Overall	354	100%	56	100%	410	100%

*Perception on the local natural environment.*

According to the survey results, 81 percent of the residents in the designated UNESCO Biosphere Reserves at the border areas of DMZ and 77 percent of the residents in the non-designated areas replied that their natural

environment is special compared to that of other regions. Overall, 95 percent of the residents in the designated areas and 90 percent of those in the non-designated areas answered that conservation of the natural environment in their current residential area is important (Figure 2 and Figure 3).

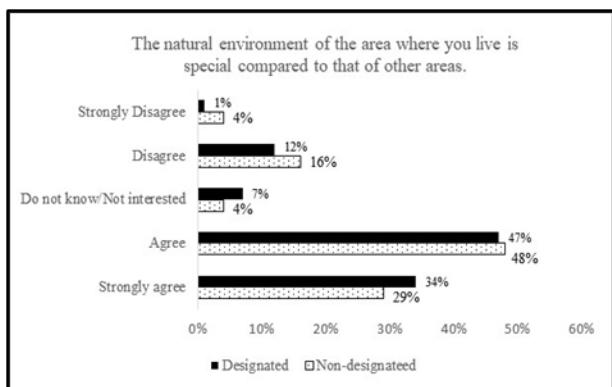


Figure No. 2. Perception on the natural environment: UNESCO Biosphere Reserve designated areas vs. non-designated areas.

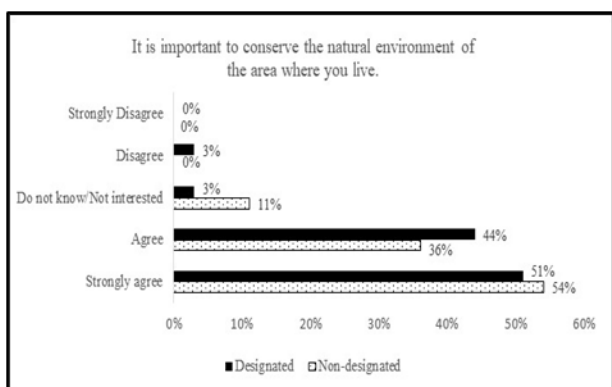


Figure No. 3. Perception on the natural environment: UNESCO Biosphere Reserve designated areas vs. non-designated areas.

*Awareness of UNESCO Biosphere Reserves. 46*

percent of respondents in the designated areas and 43 percent in the non-designated areas had never heard of UNESCO Biosphere Reserves. Furthermore, 55 percent of the respondents in the designated areas and 53 percent in the non-designated areas did not know about or were not interested in Biosphere Reserves (Figure 4 and Figure 5).

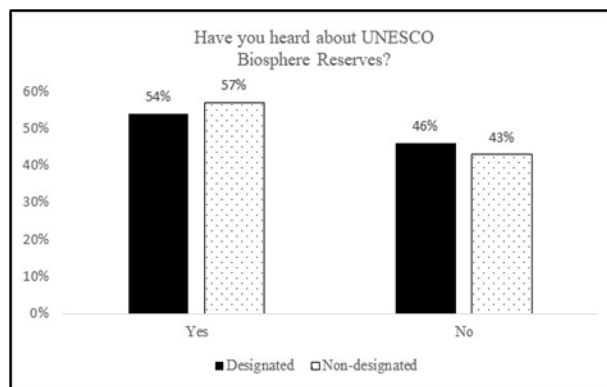


Figure No. 4. Awareness of UNESCO: UNESCO Biosphere Reserve designated areas vs. non-designated areas.

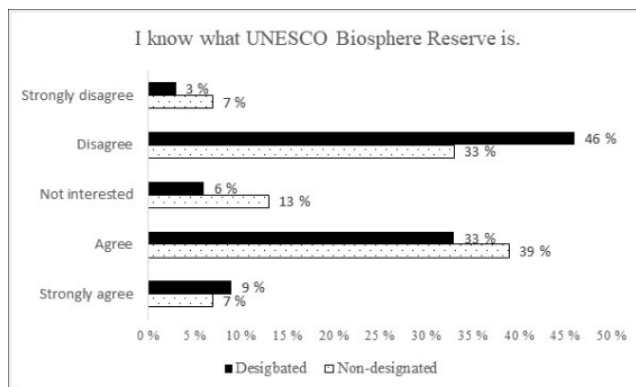


Figure No. 5. Awareness of UNESCO: UNESCO Biosphere Reserve designated areas vs. non-designated areas.



When asked whether they agreed with the designation as a UNESCO Biosphere Reserve, the proportion of residents who agreed in the designated areas was about 68 percent while 23 percent did not know or were not interested and nine percent disagreed. Among those in the non-designated areas, 63 percent agreed, 23 percent did not know or were not interested, and 14 percent disagreed (Figure 6).

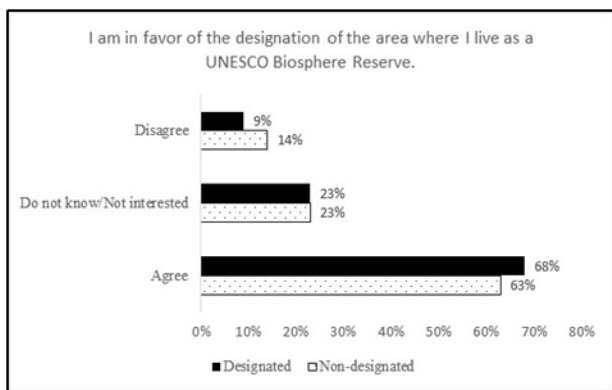


Figure No. 6. Awareness of UNESCO Biosphere Reserves: designated areas vs. non-designated areas.

*Changes after UNESCO Biosphere Reserve designation: designated areas.* In the results of the survey on the changes after designation, 47 percent of the residents in the designated areas responded positively (including very positive), 27 percent replied neutrally, 24 percent did not know or were not interested, and three percent responded negatively (including very negative). In other words, many residents positively

accepted the changes after the designation (Figure 7).

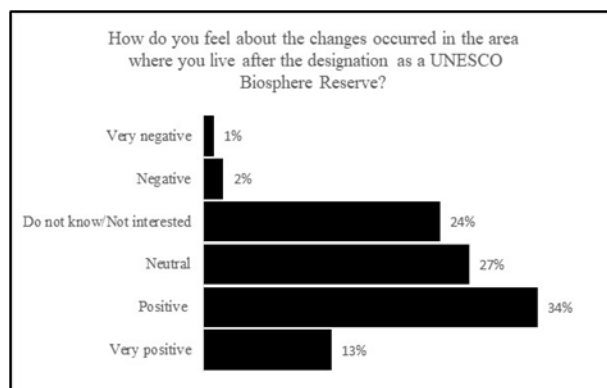


Figure No. 7. Changes after the designation of a UNESCO Biosphere Reserve: designated areas: experienced changes after designation (rounded off to the nearest integer).

When the survey respondents who answered positively (165 persons: 47 percent) were asked about the reason why they felt positive changes after the designation, they selected from a list of answers as follows: pride in their region (50 percent), revitalization of tourism (29 percent), improvement of infrastructure such as roads (10 percent), income growth (six percent), and other reasons (five percent) (Figure 8).

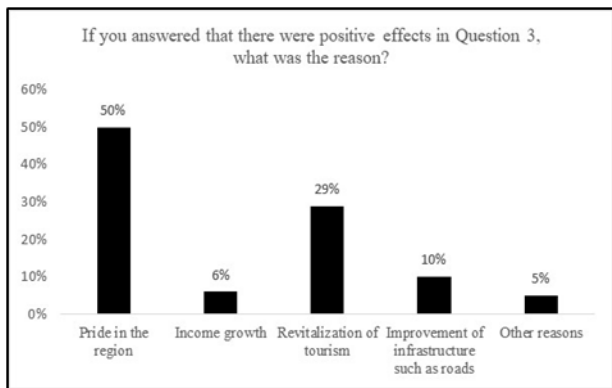


Figure No. 8. Changes after the designation of a UNESCO Biosphere Reserve: designated areas - positive effects after the designation (rounded off to the nearest integer).

Of the total respondents, 49 percent of men and 51 percent of women responded positively, which were five percentage points higher and five percentage points lower, respectively, than the total proportion of men (44 percent) and women (56 percent) in the total number of respondents. (Table 2). The occupations of the participants who responded positively were as follows: 24 percent self-employed, 22 percent agriculture/livestock, 21 percent company/government employees, 12 percent housewives, eight percent students, and 14 percent others. When compared to the occupation composition of all the respondents, there was no noticeable difference. The educational background composition of these respondents was as follows: 32 percent college graduates or higher, 44 percent middle or high

school graduates, and 25 percent elementary school graduates or lower. When compared to the educational background composition of all the respondents, the proportion was five percentage points higher in the case of college graduates or higher (27 percent), no difference in the case of middle or high school and 25 percent elementary school graduates or lower. When compared to the educational background composition of all the respondents, the proportion was five percentage points higher in the case of college graduates or higher (27 percent), no difference in the case of middle or high school graduates (44 percent), and four percentage points lower in the case of elementary school graduates or lower (29 percent).

The age group composition was as follows: eight percent in their 10s, four percent in their 20s, five percent in their 30s, 15 percent in their 40s, 20 percent in their 50s, 22 percent in their 60s, and 25 percent in their 70s; the difference was negligible when compared to the age group composition of all the respondents (Table 3).

Table. No 3. Changes after UNESCO Biosphere Reserve designation: designated areas - gender, age, education background, and occupation of positive respondents (rounded off to the nearest integer).



The reasons given by respondents who experienced negative changes (three percent: nine persons in total) were selected from a list of answers as follows: difficulty in exercising property rights (33 percent), restriction on local development (33 percent), and restriction on agricultural activities (22 percent). Other reasons (11 percent) included damage caused by wild boars (Figure 9).

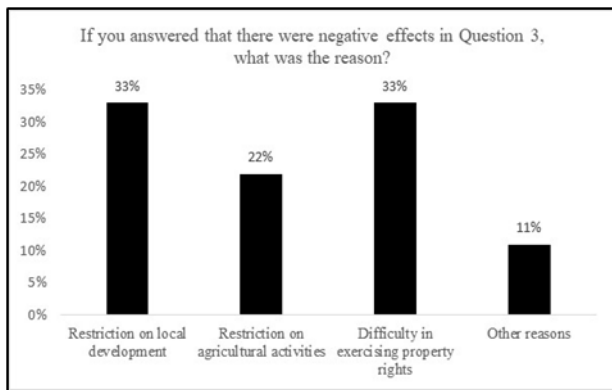


Figure No. 9. Changes after the designation of a UNESCO Biosphere Reserve: designated areas - negative effects after the designation. (rounded off to the nearest integer).

*Expected Changes After UNESCO Biosphere*

*Reserve designation: non-designated areas.*  
When asked about the expected changes after designation as a UNESCO Biosphere Reserve, 54 percent answered positively, 11 percent negatively, 21 percent neutrally, and 14 percent did not know/were not interested (Figure 10).

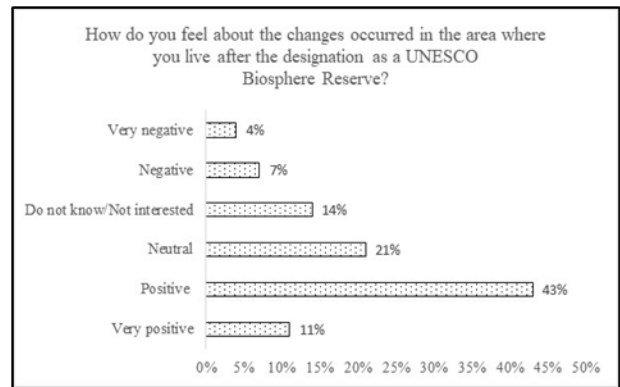


Figure No. 10. Expected Changes after UNESCO Biosphere Reserve designation: non-designated areas - expected changes after designation (rounded off to the nearest integer).

When those who expected positive changes were asked about the reasons by selecting from a list of answers, 67 percent picked pride in their region, 20 percent revitalization of tourism, seven percent improvement of infrastructure such as roads, and seven percent other reasons. Other reasons included that protection and conservation of nature is a positive factor, and so is the function of maintaining the peace in a special environment like the DMZ (Figure 11).

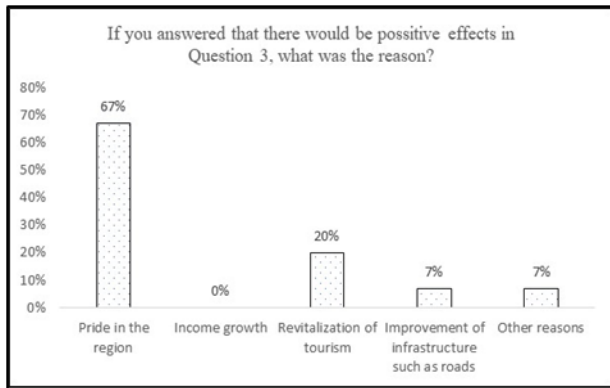


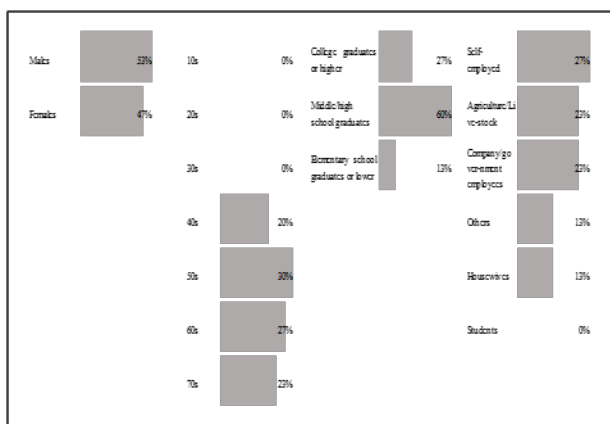
Figure No. 11. Expected changes after UNESCO Biosphere Reserve designation: non-designated areas - expected positive effects (rounded off to the nearest integer).

The proportions of men and women who gave positive responses were 53 percent and 47 percent, respectively, which were one percentagepoint higher and one percentage point lower, respectively, than the proportions of men (52 percent) and women (48 percent) in the total number of respondents, thereby showing almost no difference. The occupations of these respondents were as follows: 27 percent self-employed, 23 percent agriculture/livestock, 23 percent company/government employees, 13 percent housewives, and 13 percent others. The proportions of self-employed, company/government employees, and others were five, four, and six percentage points higher, respectively, than those of all respondents. However, the proportions of the agriculture/livestock occupations and

housewives in the positive respondents were 11 and five percentage points lower than those of all respondents, respectively. This implies that the residents who were self-employed, company/government employees, or belonging to the “other” category responded more positively to the designation as a Biosphere Reserve compared to those with the other surveyed backgrounds. The educational background composition of the positive respondents was as follows: 27 percent college graduates or higher, 60 percent middle or high school graduates, and 13 percent elementary school graduates or lower. When compared to the educational background composition of all respondents, the proportion was seven percentage points higher in the case of college graduates or higher (20 percent), six percentage points higher in the case of middle or high school graduates (54 percent), and 13 percentage points lower in the case of elementary school graduates or lower education (27 percent). In other words, the respondents with middle/high school diplomas or college degrees or higher answered more positively to the designation as a Biosphere Reserve compared to the respondents with elementary school diploma or lesser education. As for the age group composition of the positive respondents, 20 percent was in their 40s, 30 percent in their 50s, 27 percent in their 60s, and

23 percent in their 70s, and the difference was negligible when compared to the age group composition of all respondents (Table 4).

Table. No 4. Expected Changes after UNESCO Biosphere Reserve designation: non-designated areas - gender, age, education background, and occupation of positive respondents (rounded off to the nearest integer).



The reasons given by respondents who expected negative changes (11 percent: six persons in total) were selected from a list of answers as follows: difficulty in exercising property rights (33 percent), restriction on local development (33 percent), restriction on agricultural activities (33 percent), and no other reason cited (Figure 12).

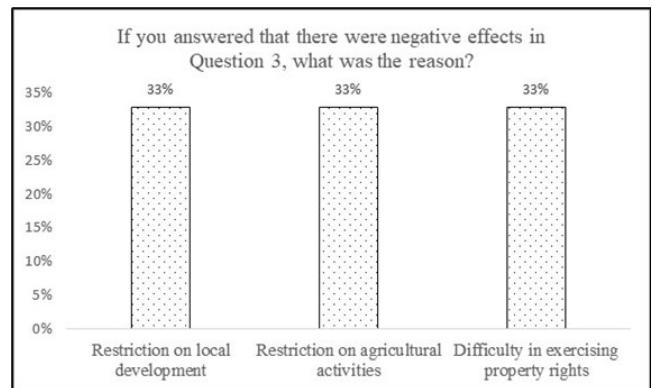


Figure No. 12. Expected Changes after UNESCO Biosphere Reserve designation: non-designated - expected negative effects (rounded off to the nearest integer).

## Discussion

### Designated areas

Most residents perceived the natural environment in the UNESCO Biosphere Reserves areas as special (81 percent). Furthermore, 95 percent of the respondents regarded the conservation of natural environment as important. However, the proportion of those who stated that they know the significance of the UNESCO Biosphere Reserve designation (34 percent), which aims to conserve special natural environments, and are aware of the designation of their residing area (34 percent) is relatively low. Therefore, it is necessary to publicize the fact that the special natural environment of the area, which most residents consider important, can be conserved through the Biosphere Reserve designation.

However, this is meaningful because people who know the significance of the Biosphere Reserve designation are more likely to agree with the designation. Among 148 persons who answered that they knew the significance of the Biosphere Reserve designation, 77 percent (114 persons) agreed with the designation.

Furthermore, among 173 persons who stated that they did not know the significance of the Biosphere Reserve designation, 62 percent (108 persons) agreed with the designation. Therefore, the approval rate for the designation was about 15 percentage points higher in the residents who stated that they knew the significance of designation than the residents who do not.

The proportion of those who had reservations (do not know/not interested) about the designation was compared between different groups. Results showed that the proportion of those who had reservations in the group that stated they knew the significance of designation was about 18 percentage points lower than that of the group that answered that they did not know. This implies that publicity and education help people to form clear opinions without taking a reserved stance.

The characteristics of the respondents (78 persons) who took a reserved stance about agreeing with the Biosphere Reserve

designation were investigated to identify the people who should be targeted for public relations and education. First, among the respondents who took a reserved stance, 62 persons (79 percent) replied that they did not know or were not interested in UNESCO Biosphere Reserve. This implies that the biggest characteristic of the residents who take a reserved stance is that they do not know the significance of Biosphere Reserve. Second, the gender ratio was 35 percent men and 65 percent women, and it was peculiar that the proportion of women was high when compared to the gender ratio of the total respondents (44 percent men and 56 percent women).

Based on the respondents (148 persons) who knew about Biosphere Reserves and agreed with the designation of reserves, the type of media from which they learned about Biosphere Reserves was investigated to identify which media forms were most influential. In the results, 38 percent was documentary videos, 31 percent public relations activities of local governments, 18 percent newspapers and books, eight percent local social gatherings, and five percent others (Figure 13). Therefore, it is expected that when public relations activities of local governments and documentary videos are used in parallel, the share of 69 percent in the

total media will be achieved, indicating the most influential means of publicity and education.

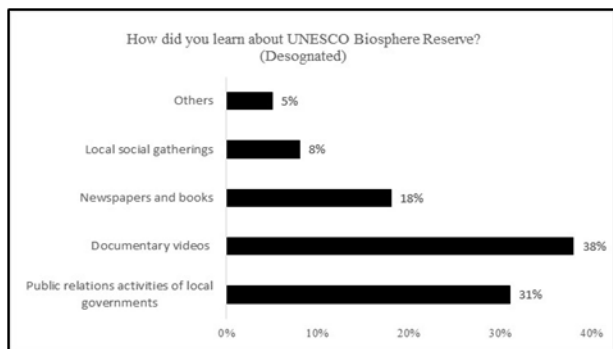


Figure No. 13. Method of learning about UNESCO Biosphere Reserve.

#### Non-designated areas

Most (77 percent) of the respondents had positive perceptions of the natural environment in the areas where the non-designated area residents lived, and 90 percent regarded the conservation of natural environment as important. These characteristics were similar to the perception levels of the designated area residents. Furthermore, the proportion (46 percent) of respondents who knew about the significance of the UNESCO Biosphere Reserve designation, which aims to conserve special natural environments, was similar between the non-designated areas and the designated areas.

The results of analysing the effect of comprehending the Biosphere Reserve in the non-designated areas on agreeing/not agreeing

with the Biosphere Reserve designation showed that the proportion of respondents who agreed with the Biosphere Reserve designation among the residents who answered that they knew about Biosphere Reserves was 63 percent. This was much higher than the proportion of respondents who agreed with the Biosphere Reserve designation among the residents who replied that they did not know about the reserves (45 percent). This implies that the respondents are more likely to agree with the Biosphere Reserve designation when they think they know about Biosphere Reserve. However, the proportion of residents who had reservations about the Biosphere Reserve designation among the residents who answered that they knew about Biosphere Reserve was 28 percent. This was lower than the proportion of residents who had reservations about the Biosphere Reserve designation among the residents who answered they did not know about Biosphere Reserve (41 percent). Furthermore, the means of publicity and education for Biosphere Reserves in the non-designated areas was indirectly investigated through survey results on the media. The results show that the most efficient means in terms of influence power in the non-designated areas is documentary videos (54 percent), followed by public relations activities of local governments (19 percent), newspapers and books (19

percent), others (8 percent), and local social gatherings (0 percent) (Figure 14).

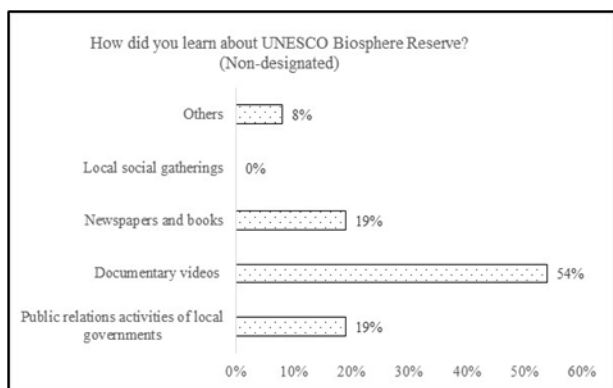


Figure No. 14. Method of learning about UNESCO Biosphere Reserve.

That is, the documentary videos and the public relations activities of local governments account for 73 percent of the total. This is similar to the survey results on the influence power of each media in the designated areas.

#### Designated and non-designated areas

The following is a summary of comparison between the designated and non-designated areas.

First, residents of both designated and non-designated areas valued the natural environment of the region and had a positive perception of its designation as a UNESCO Biosphere Reserve (Figure 2, Figure 4, and Figure 6). This result was contrary to our initial hypothesis that the two resident groups would have different

perceptions on both the importance of protecting the natural environment and UNESCO’s designation of their region.

Second, participants who think they know about the Biosphere Reserve showed a higher proportion of agreement regarding the region’s designation than those who were less aware (15 percent higher in designated areas, 18 percent higher in non-designated areas) (Figure 5 and Figure 6). Also, those who were less aware provided a reserved response to their region’s designation (18 percent more in designated areas, 13 percent more in non-designated areas) (Figure 5 and Figure 6). There was also a slightly higher representation of respondents with a college degree or higher who felt positive changes after UNESCO’s designation (five percent higher in designated areas, seven percent higher in non-designated areas), and a lower representation of respondents with an educational background lower than elementary school (four percent lower in designated areas, 13 percent lower in non-designated areas) (Figure 7 / Figure 10 and Table 3 / Table 4) Regarding the occupational group composition of positive respondents, self-employed and company/government employee groups responded more positively to the changes after designation (five percent and four percent higher in non-designated areas, respectively)



while the agricultural and livestock industry workers responded more negatively (11 percent lower in non-designated areas) (Table 4).

Third, the survey data suggested that efforts to inform, promote and educate the UNESCO Biosphere Reserve to residents needed significant improvements in both regions. The proportion of respondents who had not heard about the UNESCO Biosphere Reserve was 46 percent in designated areas and 43 percent in non-designated areas (Figure 3). The proportion of respondents who did not know about the UNESCO Biosphere Reserve was 55 percent in designated areas and 53 percent in non-designated areas (Figure 5). Particularly in designated areas, 66 percent of respondents did not know that their region was a UNESCO Biosphere Reserve, even though more than a year had passed since the designation. The problem is that designation as a UNESCO Biosphere Reserve does not necessarily mean that the area will retain the designation. Every 10 years, reports must be submitted to prove that the region continues to meet the requirements of its designation, and the designation may be cancelled if the region no longer qualifies. Active participation of residents is one of the most important criteria for continued designation<sup>2</sup>. Therefore, it is crucial to continuously provide information

about the UNESCO Biosphere Reserve and engage residents.

Fourth, the survey analysis showed that more publicity should be targeted toward those who take a reserved stance in both designated and non-designated areas. Although those who answered positively to the designation of UNESCO Biosphere Reserves outnumbered those who answered negatively, there was a significantly high proportion of respondents who answered “don’t know/not interested” (Figure 6). Particularly, regarding the change after the designation, 51 percent of respondents in designated areas answered “neutral” or “don’t know/not interested” rather than positive or negative. The key to success in the UNESCO Biosphere Reserve will thus depend on generating more interest from these people by providing them with opportunities for positive experiences. One thing to note is that although only 47 percent of respondents in designated areas explicitly said that they felt positive changes after UNESCO’s designation, 68 percent of the respondents said that they would agree with their area continuing to be designated as a UNESCO Biosphere Reserve. Those who said they would agree with the designation again could have given this answer because they felt positive changes, and the 21 percent difference between this group and those who

answered explicitly that they felt positive changes could then be included somewhere in the group that responded "neutral" or "don't know/ not interested". Therefore, there could be a significant number of people among those who have responded "neutral" or "don't know/ not interested" who could gain a positive perspective through effective publicity and education.

Fifth, the results showed that it was necessary to adapt promotion efforts according to regional characteristics or age group. Despite the rural nature of the area, where come-and-go between neighbours is relatively more active than cities, there were surprisingly few cases in which respondents learned about the UNESCO Biosphere Reserve through neighbours or local gatherings (Figure 13). Therefore, such channels need to be used more actively in the future. Also, many of the local survey respondents were people over the age of 60 years old, who may be less familiar with accessing information through the Internet (Table 2). As such, community-oriented education and offline publicity methods are more likely to be appropriate for them. However, existing publicity methods through documentary videos (TV/media) and local governments still appear to be the best channels for publicity regardless of region or age group,

and they should continue to be utilized (Figure 13 and Figure 14).

Sixth, it is necessary to promote that the UNESCO Biosphere Reserve program is not only for the conservation of biodiversity and natural environment, but also for their sustainable use that leads to economic development of the local community. While survey respondents in both designated and non-designated areas chose "(increased) pride in the region" as the most positive change (or the most expected positive change) after UNESCO's designation, very few respondents answered that the designation could also be linked to an increase in their income (Figure 7, Figure 8, Figure 10 and Figure 11). Therefore, it would be helpful to inform residents of good domestic and overseas cases that have successfully revitalized the local economy after being designated as a UNESCO Biosphere Reserve (Park, G., 2013).

Seventh, it is necessary to promote that the designation as a UNESCO Biosphere Reserve does not introduce additional regulations in buffer or transition areas (Nature Policy Division, 2012). Both residents of designated and non-designated areas were concerned that additional regulations would be introduced through the designation, and that these regulations could become an obstacle to local

development, farming activities, and exercise of property rights (Figure 9 and Figure 12). However, the UNESCO Biosphere Reserve program only recommends regulations for the preservation of the ecological environment in key areas, but not particularly in buffer areas or transition areas where residents are working. Rather, residents in UNESCO Biosphere Reserves can receive financial, administrative, and technical support from the federal and local governments if necessary (Gangwon Research Institute, 2014). Even so, it is still necessary to explain the fact that there might be a halt on activities that cause environmental damage, such as illegal farmland expansion or polluting methods of farming which are conducted in violation of current regulations (Nature Policy Division, 2012). Throughout this process, government ministries and local governments should carefully consider the special situations faced by the areas and the issues raised by the residents, seek solutions together, and consider what support or compensation is realistically possible.

From the survey analysis conducted above on designated and non-designated areas, the perceptions of the two resident groups regarding nature conservation and UNESCO Biosphere Reserve designation were clarified and the problems that need to be solved were specified.

However, results did not show significant differences in perception between participants in designated and non-designated areas, which was the original hypothesis. The following minor differences were identified. First, designated areas are slightly more positive regarding the natural environment of their areas than non-designated areas. Although people from both regions thought their natural environment was important, the percentage of people who answered positively was four percent higher in designated areas and those who answered negatively were seven percent lower in these areas (Figure 2). In addition, as a special feature of their local environment, “beautiful landscape” was most often selected in designated areas, whereas “historical meaning and value of DMZ” was selected more in non-designated areas (Figure 15).

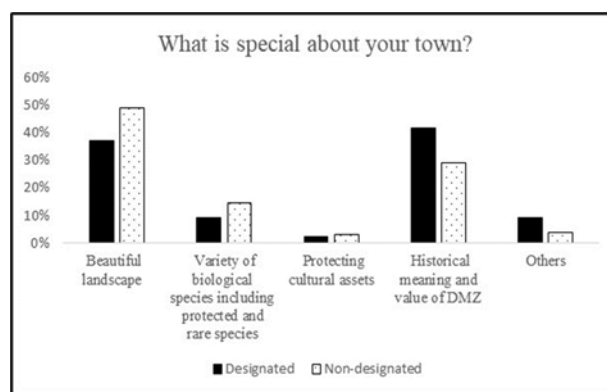


Figure No. 15. Perception on the natural environment: UNESCO Biosphere Reserve designated areas vs. non-designated areas.

The number of people who think it is important to preserve the natural environment of their region was also five percent higher in designated areas, and the approval rate for UNESCO designation was equally five percent higher (Figure 4 and 6). Second, the tendency to think the relation between the designation of UNESCO Biosphere Reserve and economic aspects was also slightly higher in designated areas (Figure 8 and 11). Six percent of respondents from designated areas chose increased income as a positive change after designation while no one from non-designated areas expected it.

## **Conclusion**

The results of our survey analysis as described above showed that, contrary to our initial hypothesis, there was no significant difference in perception between residents of the UNESCO Biosphere Reserves and those in non-designated areas. Both groups of residents valued the nature of their region and had a positive perception of protecting it through its designation as a UNESCO Biosphere Reserve. Their perception also showed a lot of similarities rather than differences. Therefore, the main factors that determined whether these two areas were designated as UNESCO Biosphere Reserves should be explored in other aspects, such as

economic, political, and social, rather than differences in perception<sup>3</sup>.

Within the limit of the current article, the important result is that both regions need to be supplemented with proper information delivery and promotion. Due to a lack of adequate information, residents in both designated and non-designated areas did not fully understand that the UNESCO Biosphere Reserve program pursues not only the conservation of nature but also the development of the community. Due to a lack of correct information, both groups were concerned that UNESCO's designation would bring about more restrictions on regional development, farming activities, and property rights. Due to a lack of publicity, more than half of the residents from designated areas did not know that their areas were already designated as UNESCO Biosphere Reserves. Therefore, these publicity issues will need to be addressed and factors that determine designation other than residents' perception will need to be found and resolved. When these issues are resolved, considering the high awareness of nature conservation and approval rate for UNESCO designation in both areas, non-designated areas are likely to support their designation as UNESCO Biosphere Reserves and designated areas will be able to achieve more active resident participation and efficient management.

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due to the opposition of the residents (Moon, I., 2008).

2. The Statutory Framework of the World Network of Biosphere Reserves, Article 9.1, Article 9.6 and Article 4.6. (MAB Korea Committee, 2010).

3. As an example, refer to the characteristics of non-designated areas with many good development opportunities (Paju City, 2018).

## ENDNOTES

1. In the case of Ozark portions of Missouri and Arkansas in the United States, the residents did not receive any relevant information until the final selection stages in the designation process of UNESCO Biosphere Reserve and the project proceeded without proper participation of the residents. Consequently, the designation process which had continued for over nine years was unsuccessful due to the strong opposition of the residents (United States Department of State, 1998). In Uido, Jeollanam-do, the designation of UNESCO Biosphere Reserve was postponed