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Abstract

Many regions encounter a dilemma of how economic growth should be pursued with cultural and environmental conservation under global competition. While there are several articles that examine the relationship between development and environment, little is known about how people in a region prefer future development scenarios across economic growth and conservation. We pose a research question of how Miyako Island (MYK) people in Japan prefer a future development scenario over the growth vs. the conservation as well as rural tourism vs. urban one. It is hypothesized that (i) prosocial people and/or with an identity "I am a MYK person" prefer conservation by rural tourism and (ii) people with long residential time in MYK prefer economic growth by urban tourism. We conducted online choice experiments with permanent and temporary residents, collecting the data over their preferences for the scenarios, prosociality, experiences and socioeconomic factors. The results show that (i) people who have spent a relatively long period of their lives in (outside) MYK prefer the growth (conservation), (ii) a majority of MYK people are prosocial and do not prefer economic growth by urban tourism and (iii) prosocial and/or environmentally concerned people support conservation by rural tourism. Overall, we interpret that how people have been associated with MYK as residents or outsiders causes their preference gap, however, the gap will get resolved to conservation by rural tourism as people become prosocial and environmentally-concerned. In addition, it is concluded that the current development process that follows economic growth by urban tourism in MYK is unlikely to contribute to the residents' wellbeing due to discrepancy with what the residents prefer on the basis of our results.

Key Words: Economic growth; social value orientation (SVO); environmental concern; tourism; discrete choice experiment; future development scenario

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1 Introduction

While climate change and environmental problems remain as serious concerns for humanity, global competition has been intensified as an ongoing process, driving regional economies to grow and decline depending on their culture, environment, innovation, geography and market conditions (Dwyer, 2015). Thus, many regions in the world face a dilemma of whether to prioritize economic growth or cultural and environmental conservation in an era of globalization (Mol, 2003). With the dilemma, what and how people in a region prefer among development scenarios between economic growth and conservation shall characterize and shape their regional economic states in the future via the degree of their consensus or disagreement. It is likely that a group of people in a region may prefer conservation to economic growth for their wellbeing and quality of life, whereas the other group of people in that region may prefer the opposite for the same reasons (Stimson et al., 2006, Easterlin and Angelescu, 2011, Barca et al., 2012). In other words, investigating people's preferences for future development shall be informative to understand what people demand for regional economies as well as to improve their wellbeing and quality of life through customized policy formation. Given this state of affairs, this paper addresses how people in a region prefer future development scenarios between economic growth and conservation.

For sustainable future development, it is essential to identify potential channels that drive economic growth. To this end, a series of studies aim to understand the key determinants of regional economic development (Srinivasu and Rao, 2013, Pradhan et al., 2021). Kyoi et al. (2023) evaluates people's diverse environmental preferences for future development scenarios through a discrete choice experiment and identifies the significance of land use preferences. By conducting choice experiments, Kim (2018) observe that tourism quality and the attraction of rural tourists are crucial for sustainable rural economic development. By analyzing panel data, Andry et al. (2025) examines how tourism has the potential to reduce income inequality and foster economic progress and finds that the growth of tourism is linked to a reduction in income inequality in island countries of the Indian Ocean. Pradhan et al. (2021) identify the important role of ICT infrastructure development in promoting economic growth using the panel data of 20 Indian states.

Conservation is often perceived as being in opposition to economic growth; however, it is essential for sustainable future development. The existing literature highlights the importance of conservation as a fundamental component of future development strategies. Estifanos et al. (2020) conducted a choice experiment with 316 households in Ethiopia to investigate rural residents' preferences for conservation management options aimed at protecting endangered species. Their findings indicate that residents prefer to receive financial incentives from rural tourism. Through scenario analysis, Hashimoto et al. (2019) explored how alternative development pathways influence future land-use patterns, biodiversity, and ecosystems. Their study underscores the significance of land-use policies in shaping the future availability of ecosystem services and biodiversity. Similarly, Ghatak (2010) emphasizes the need to balance environmental conservation with economic development, particularly in communities reliant on natural resources. Based on primary and secondary data analysis, their study demonstrates that environmental conservation and future development can be compatible.

Tourism is a key driver of regional development, particularly in island areas, where it often serves as the primary economic engine. Over the past few decades, tourism has played a significant role in fostering economic growth in many nations (Andry et al., 2025). However, its impact on local development has both positive and negative aspects, as highlighted by previous studies. According to Bartik (2003), tourism may contribute to income inequality by driving up prices and increasing property values. Similarly, Papatheodorou (2004) argues that tourism can widen the wealth gap by benefiting large international corporations at the expense of smaller local businesses. On the other hand, Kim (2018) emphasizes that ongoing efforts to enhance the quality of tourism resources in rural areas, as well as to attract and satisfy rural tourists, are crucial for the long-term sustainability of rural economies. Despite the extensive literature on the effects of tourism, little attention has been given to identifying the specific types of tourism that local communities desire as pathways for future development.

While several studies empirically examine the relationship between economic development and the environment, little is known about how people in a region choose future development

scenarios across economic growth and conservation. Thus, we pose a research question of how Miyako Island (MYK) people in Japan prefer a future development scenario over the growth vs. the conservation as well as rural tourism vs. urban one. This study hypothesizes that (i) prosocial people and/or with an identity "I am a MYK person" prefer the conservation and rural tourism and (ii) people with long residential time in MYK prefer the growth and urban tourism. To test those research hypotheses, we conducted online choice experiments with permanent and temporary residents, collecting the data regarding their preferences for the scenarios, prosociality, experiences and socioeconomic factors. As of our knowledge, this is one of the pioneering attempts to analyze the preference of future development scenarios in the island area.

2 Methodology

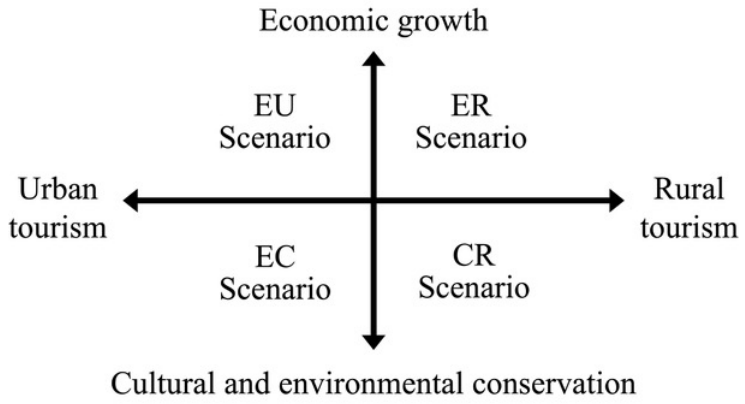
2.1 Study area

We selected Miyako Island (MYK) as our study area. It is located between the main island of Okinawa and Taiwan. There are 28 282 households, and the population is 55 569. Miyakojima is a rural area with abundant natural capital. The island is situated in a semi-tropical biome, making it the only place in Japan with such characteristics. Miyakojima was formed by coral reefs, and it has neither mountains nor rivers. The average temperature is 23.8°C, and the annual precipitation is 2057 mm. MYK has a thriving tourism industry and agriculture. Due to these economic activities, especially tourism, the nominal GDP of MYK reached 182 521 million JPY (Miyakojima city office, 2021).

2.2 Discrete choice experiment

An online survey was conducted using a representative sample of 251 MYK people from November, 2024 to December, 2024. The survey primarily investigated the inhabitants' preferences for sustainable development patterns (referred to as scenarios). It also gathered information

Figure 1: Four scenarios comprising two axis for future development



on respondents' environmental perceptions, social value orientations (SVO), discrete choice experiments, and socioeconomic characteristics. Participants selected their preferred options through a series of choice tasks (Saito et al., 2019, Kyoi et al., 2023). The discrete choice experiment in this study evaluates people's preferences for sustainable future development scenarios.

In this study, we develop scenarios by combining study area-specific storylines that depict plausible alternative development pathways (figure 1). This approach, commonly known as the story-and-simulation method (Alcamo, 2008), integrates qualitative assumptions with quantitative models and is highly effective for addressing dynamic uncertainties in social-ecological systems. The first axis represents the relative orientation of social development achievements and indicates two possible directions: whether MYK prioritizes economic growth or focuses on cultural and environmental conservation for sustainable development. Meanwhile, the second axis defines two distinct channels through which sustainable development could be realized—namely, urban tourism or rural tourism.

2.3 Scenario assumption

EU scenario represents a scenario of "economic growth," leveraging both tangible and intangible assets such as tourism and geographical advantages. The goal is to promote economic growth

via urban tourism. In this scenario, MYK will develop amusement facilities and infrastructure to improve the convenience of residents' lives by establishing logistical hubs. Additionally, MYK plans to introduce modern accommodations and casinos to attract tourists. It is expected that MYK will capitalize on its geographical advantages as a transit point in Asia, leading to substantial economic gains. As a result, MYK could acquire significant economic resources and experience dramatic development.

ER scenario represents a scenario of "economic growth" through rural tourism by leveraging tangible resources such as natural materials like mango, hemp, and beaches. The goal is to promote economic growth via rural tourism. In this scenario, MYK will develop products for a wide range of customers, including mango-based goods, traditional handicrafts, and sugarcane exports, utilizing e-commerce, social media marketing, and government support, such as JETRO services (e.g., Japan Street, Japan Store), to boost exports. MYK will also need to compete with other regions producing similar products, such as mangoes from Miyazaki and hemp from China. Furthermore, MYK will promote outdoor activities like coral reef tours. As a result, MYK could build strong and independent economic resources.

CU scenario represents a scenario of "cultural and environmental conservation" through urban tourism by leveraging both tangible and intangible assets of MYK. The goal is to promote cultural and environmental conservation via urban tourism. In this scenario, MYK would promote its cultural festival, Pantu, to a global audience and aim to elevate it to the status of a national event, like Namahage in Akita, by utilizing social media. Additionally, MYK will develop more eco-friendly aquariums, building on the concept of the existing underwater park. As a result, MYK could achieve a balance of coexistence, conservation, and economic growth.

CR scenario represents a scenario of "cultural and environmental conservation" with permaculture to create a sustainable society. The goal is to promote cultural and environmental conservation via rural tourism. In this scenario, MYK will produce only the necessary products for daily life, minimizing exports and focusing on adding value to local products by following an international strategy of low integration and low responsiveness. MYK aims to promote local food production

and consumption while also exporting organic products. They will encourage homestays and rural accommodations to offer tourists an authentic local experience. Additionally, MYK will adopt fully renewable energy sources, such as wind and solar power. As a result, MYK will achieve an eco-friendly society with a low carbon footprint, reduced virtual water use, carbon neutrality, and a lifestyle with low food miles.

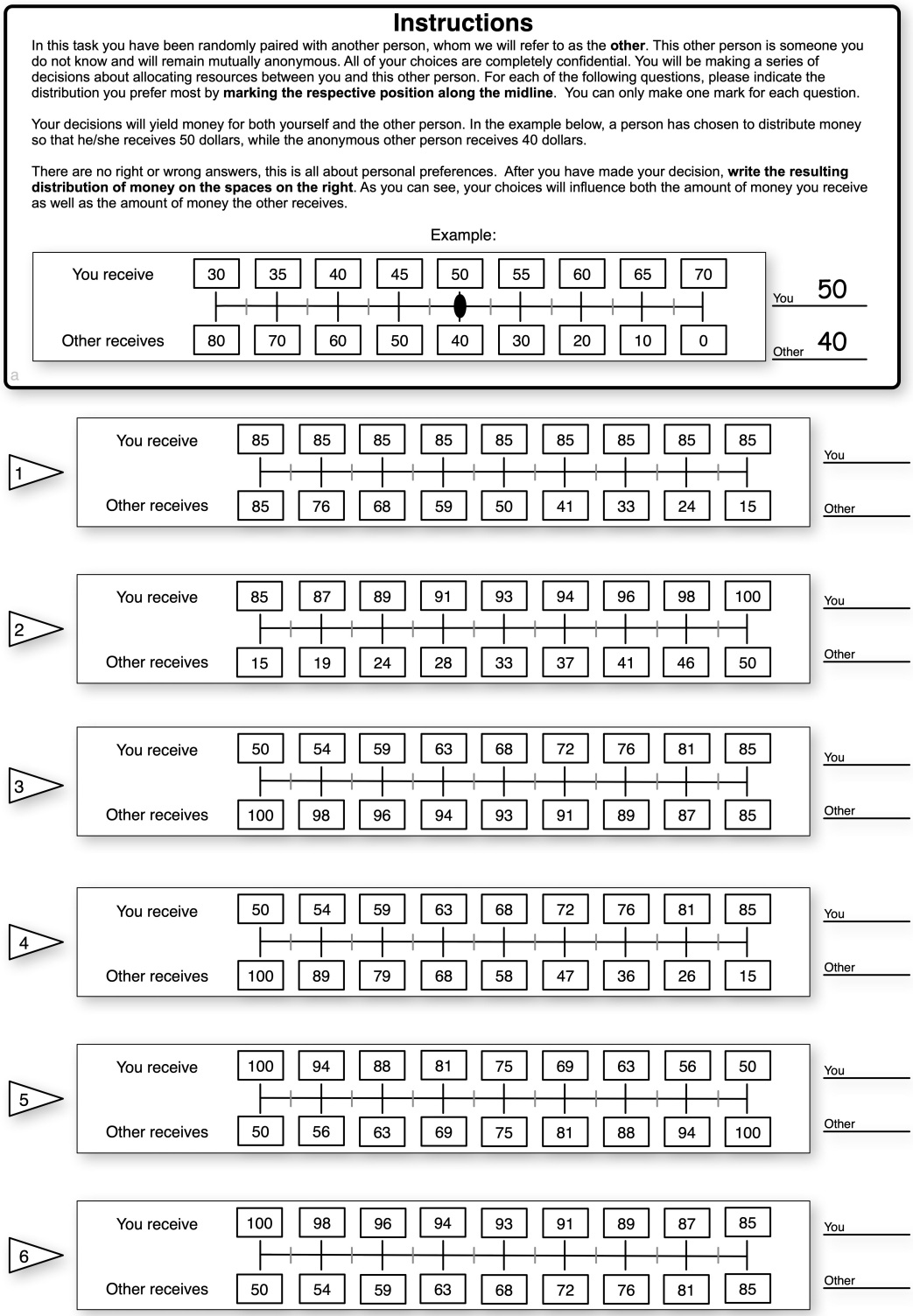
2.4 Social value orientation

Social value orientation (SVO) is designed to categorize subjects based on their social preferences into altruistic, prosocial, individualistic or competitive (Van Lange et al., 1997, 2007, Brosig et al., 2011, Carlsson et al., 2014, Sutters et al., 2018). This study employs the "slider method" to assess how subjects prioritize their benefits compared to others, which is crucial for understanding cooperative behaviors (Borghans et al., 2008). Figure 2 presents this method, showing that subjects responding to six items, each offering nine options for distributing points between themselves and an anonymous partner. These options gradually shift benefits from the partner to the subject. For example, in the first item, choices range from both receiving an equal 85 points to the subject receiving 85 points while the partner's share reduces to 15 points. Mean allocations for the subject $\overline{A}_s$ and the partner $\overline{A}_p$ are computed from all six items. Then, 50 is subtracted from $\overline{A}_s$ and $\overline{A}_p$ to shift the base of the resulting angle to the center of the circle $(50, 50)$. The index of a subject's SVO is determined as SVO $= \arctan \frac{(\overline{A}_p)-50}{(\overline{A}_s)-50}$. Based on SVO indices, social preferences are categorized as altruist (SVO $> 57.15°$), prosocial ($22.45° <$ SVO $< 57.15°$), individualist ($-12.04° <$ SVO $< 22.45°$), and competitive (SVO $< -12.04°$) (Murphy et al., 2011).

2.5 Statistical analysis

This study applies logit regression to model the preferences for future development scenarios across economic growth and conservation in related to SVO, experiences and socioeconomic factors. People's preference for future developments is expressed as a binary choice model of logit regression, assuming that the preferences depends on observable factors. Let Y_i^Ks are the depen-

Figure 2: Instructions to measure social value orientation (SVO) by the slider method



dent variables of cultural and environmental conservation and development by rural tourism such that $Y_i^K = 1$ if people i prefer cultural and environmental conservation and development by rural tourism, respectively, otherwise $Y_i^K = 0$. The probability for respondent i to prefer cultural and environmental conservation and development by rural tourism denoted by $\mathrm{Prob}(Y_i^K = 1)$, is assumed to follow the distribution function F evaluated at $X_i\boldsymbol{\beta}^K$ where X_i is a $1 \times (m+1)$ vector of explanatory variables for respondent i ($X_i = (1, x_{i1}, \ldots, x_{im})$) and $\boldsymbol{\beta}^K$ is a $(m+1) \times 1$ vector of parameters ($\boldsymbol{\beta} = (\beta_0^k, \beta_1^k, \ldots, \beta_m^k)'$). The logit regression takes the following form of a distribution function.

$$\mathrm{Prob}(Y_i^K = 1) = \frac{\exp\left(X_i\boldsymbol{\beta}^K\right)}{1 + \exp\left(X_i\boldsymbol{\beta}^K\right)} \tag{1}$$

A specification of equation (1) enables us to estimate parameters $\boldsymbol{\beta}$ via maximum likelihood and the probability for a respondent to prefer cultural and environmental conservation and development by rural tourism in relation to explanatory variables (Wooldridge, 2010, 2019). The explanatory variables of this research include SVO, years of residence, identity of MYK, age, employed, education, income, environmental perception. The definitions of the variables are summarized in table 1. This research identifies a marginal effect of each explanatory variable on the probability of $\mathrm{Prob}(Y_i^K = 1)$ along with the statistical significance, holding all other variables fixed. Specifically, the estimated marginal effect is a change in the probability for a respondent to desire the future developments when one explanatory (dummy) variable increases by one unit (or from zero to one) via equation (1).

3 Results

3.1 Data summary and set of models

Table 2 represents the summary statistics of dependent variables and independent variables from the 251 subjects which have experience or background in Miyako Island (MYK). We apply

Table 1: Definitions of the variables

Variables	Definitions of the variables included in regressions
Dependent variables	
Cultural and environmental conservation (CEC)	A dummy variable that takes 1 if a subject choose conservation, otherwise, 0.
Development by rural tourism (DBR)	A dummy variable that takes 1 if a subject choose rural tourism, otherwise, 0.
Independent variables	
Social value orientation	The prosociality for the subject ranges between 1-4 Competitive = 1; Individualistic = 2; Prosocial = 3, Altruistic = 4
Years of residence	The level of years of residence for the subject ranges between 0-4, Less than 5 years (0) to More than 20 years (4)
Identity of MYK	A dummy variable that takes 1 if a subject choose Myakpit; otherwise, 0.
Age	Age of subject.
Environmental perception	Strong disagree (1) to Strongly agree (5)
Employed	A dummy variable that takes 1 if a subject is employed; otherwise, 0.
Education	The level of education for the subject ranges between 0-6, No education (0) to postgraduate (6)
Income	The level of income for the subject ranges between 0-11, No income (0) to More than 10 million JPY per year (11)

the Pearson chi-square test to determine whether or not there is any association between future development goals and channels. According to table 3, the chi-square statistics are 8.743 and the P-value is 0.003, which represents that the two dummy variables are not independent (there is an association). Additionally, people are not likely to prefer economic growth by urban tourism. Regarding dependent variables, the mean of both dependent variables, the conservation for future development and development by rural tourism, are 0.586 and 0.630, respectively. This data identifies majority choose a future development scenario prioritizing the conservation by rural tourism. The average age of people is 37 years, identifying the data was collected variety generation. The mean of identity of MYK and employed are 0.526 and 0.637, respectively, evaluating more than half people recognize their identity in MYK and engage in occupation. The median of years of residence, education and income are 3, 4 and 3, respectively, representing 13 years living in MYK, 16 years schooling and approximately 3.50 million JPY per year. National Tax Agency (2023) reports that average income in Japan is 4.61 million JPY per year. The mean values of people's environmental perception is 3.6, recognizing a high level of concern for environment. The average value of local people's SVO is 2.9, indicating they have high prosociality.

Logit model in table 4 reports the regression results on cultural and environmental conservation for future development. We apply different regression model specificaion to check the robustness in our analyses, and confirm that the main results in table 4 remain the same in all models. Model

Table 2: Summary statistics

Variables	Obs	Mean	Median	SD	Min	Max
Dependent variables						
Cultural and environmental conservation	251	0.586	1	0.494	0	1
Development by rural tourism	251	0.630	1	0.483	0	1
Independent variables						
Social values orientation (SVO)	251	2.932	3	0.399	1	4
Years of residence	251	2.809	3	1.188	0	4
Identity of MYK	251	0.526	1	0.500	0	1
Age	251	36.538	29	17.637	15	88
Environmental perception	251	3.550	3	1.000	1	5
Employed	251	0.637	1	0.482	0	1
Education	251	3.749	4	0.642	0	6
Income	251	2.996	3	3.053	0	11

Table 3: Contingency table

	Channels		
	Urban tourism	Rural tourism	Total
Future development goals			
Economic growth	27	77	104 (0.41)
Cultural and Environmental Conservation	65	82	147 (0.59)
Total	92 (0.37)	159 (0.63)	251
Peason chi(1) = 8.743, Pr = 0.003			

1 contains prosociality, years of residence, identity of MYK and age as independent variables in our regression. Next, we include cognitive and socio-demographic variables in model 2. In model 2, the coefficient of SVO, years of residence and age are 5 %, 1 % and 1 % significant levels, respectively. Based on the marginal effect in Model 2, people are 7 % points likely to prioritize the conservation as a development target with each 10-year increase in age. An increase in years of residence by one category improves the probability of preferring economic growth as a development target by 10 % points. These findings suggest that respondents who have spent a relatively larger proportion of their lives residing in MYK tend to favor economic growth as well as the conservation on a desired outcome for future development. Moreover, people exhibiting high prosociality are 21 % points likely to prioritize the conservation. In summary, prosocial poeple tend to prefer the conservation, while those who have spent a relatively long proportion of their lives in MYK are likely to prioritize the growth as a development goal.

Table 5 represents regression the coefficients and marginal effects of the independent variables on the rural tourism in logit regressions. Similar to table 4, we also follow the same procedure and find that the results remain the same in all models. Independent variables in both models are the same as table 4. In model 1, the coefficients of SVO and age are significant at 10 % level, while in model 2, both are insignificant. The marginal effect associated with SVO is 0.139 in model 1, implying that people are likely to prefer rural tourism to urban one by 14 % points. In model 2, the coefficient of environmental perception is 5 % significant level, and an increase in environmental perception by one unit enhances the probability to prefer rural tourism as a development channel by 6 % points.

Overall, the main results in this research are summarized as follows: (i) people who have spent a relatively long period of their lives in (outside) MYK prefer the growth (conservation), (ii) a majority of MYK people are prosocial and do not prefer economic growth by urban tourism and (iii) prosocial and/or environmentally concerned people support conservation by rural tourism. Moreover, the results can be interpreted that how people have been associated with MYK as residents or outsiders causes their preference gap, however, the gap is expected to get resolved towards

Table 4: Regression coefficients and marginal effects of the independent variables on the cultural and environmental conservation in logit regressions

Variables	Model 1		Model 2	
	Coefficient	ME	Coefficient	ME
Social values orientation (SVO)	0.862**	0.208**	0.866**	0.209**
	(0.383)	(0.092)	(0.374)	(0.090)
Years of residence	−0.375***	−0.092***	−0.403***	−0.097***
	(0.139)	(0.033)	(0.145)	(0.035)
Identity of MYK	0.222	0.054	0.263	0.063
	(0.285)	(0.069)	(0.295)	(0.071)
Age	0.025***	0.006***	0.030***	0.007***
	(0.008)	(0.002)	(0.010)	(0.002)
Environmental perception			0.125	0.030
			(0.136)	(0.033)
Employed			−0.154	−0.037
			(0.415)	(0.100)
Education			−0.246	−0.059
			(0.216)	(0.052)
Income			−0.026	−0.006
			(0.065)	(0.016)
Constant	−2.104**		−1.605	
	(1.146)		(1.370)	
Sample size	251		251	
Wald chi2	15.160		17.710	
Log-likelihood	−160.490		−158.740	

*** significant at 1 % level
** significant at 5 % level
* significant at 10 % level
Standard errors are in parentheses

Table 5: Regression coefficients and marginal effects of the independent variables on the rural tourism in logit regressions

Variables	Model 1		Model 2	
	Coefficient	ME	Coefficient	ME
Social values orientation (SVO)	0.600*	0.139*	0.446	0.107
	(0.349)	(0.080)	(0.353)	(0.081)
Years of residence	−0.001	−0.001	0.045	0.010
	(0.120)	(0.028)	(0.124)	(0.028)
Identity of MYK	0.011	0.003	0.015	0.003
	(0.267)	(0.062)	(0.276)	(0.064)
Age	0.014*	0.002*	0.013	0.003
	(0.06)	(0.76)	(0.09)	(0.02)
Environmental perception			0.261**	0.060**
			(0.132)	(0.030)
Employed			0.258	0.059
			(0.434)	(0.100)
Education			0.329	0.076
			(0.235)	(0.054)
Income			−0.066	−0.015
			(0.072)	(0.017)
Constant	−1.710*		−3.528***	
	(0.40)		(1.377)	
Sample size	251		251	
Wald chi2	6.970		12.020	
Log-likelihood	−161.488		−158.409	

*** significant at 1 % level
** significant at 5 % level
* significant at 10 % level
Standard errors are in parentheses

the "conservation" and "rural tourism" scenario as people become prosocial and environmentally-concerned. Another point to note is that a majority of MYK people are prosocial and do not demand economic growth and urban tourism scenario for their future, i.e., EU scenario. However, an ongoing MYK development is exactly following the EU scenario, that is, inviting and bringing casinos and hotels along with development of transportation and urban infrastructures in MYK. Unfortunately, it is concluded that the current development process in MYK is unlikely to contribute to MYK people's wellbeing on the basis of our results.

4 Conclusion

This study addresses how MYK people prefer future development scenarios. We pose a research question of how MYK people in Japan prefer a future development scenario over the growth vs. the conservation as well as rural tourism vs. urban one. It is hypothesized that (i) prosocial people and/or with an identity "I am a MYK person" prefer the conservation and rural tourism and (ii) people with long residential time in MYK prefer the growth and urban tourism. We conducted online choice experiments with permanent and temporary residents, collecting the data over their preferences for the scenarios, prosociality, experiences and socioeconomic factors. The results show that (i) people who have spent a relatively long period of their lives in (outside) MYK prefer the growth (conservation), (ii) a majority of MYK people are prosocial and do not prefer economic growth by urban tourism and (iii) prosocial and/or environmentally concerned people support conservation by rural tourism. Overall, we interpret that how people have been associated with MYK as residents or outsiders causes their preference gap, however, the gap will get resolved to conservation by rural tourism as people become prosocial and environmentally-concerned. In addition, it is concluded that the current development process that follows economic growth by urban tourism in MYK is unlikely to contribute to the residents' wellbeing due to discrepancy with what the residents prefer on the basis of our results.

We finally acknowledge several limitations to our study and suggest future directions for re-

searches. First, our data indicates that prosocial people are dominant and the nature of our data may limit the generalizability of the main findings. Therefore, future studies should be able to focus on some other island regions, such as Maldives, investigating the same research questions and hypotheses. Second, our research collects the data only from MYK people, i.e., permanent and temporary residents, without including outsiders who consider MYK as a potential destination of their travels. It shall be important for us to analyze the samples of outsiders along with insiders, examining how they wish to MYK future development. By doing so, we may be able to clarify and integrate insiders' and outsiders' points of views for supply and demand sides in MYK economy. Despite these limitations, it is our belief that this study becomes an important first step for understanding preferences for future development scenarios in island regions.

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