

A Study on Tourism Promotion Measures from the Viewpoints of Transportation Service and Tourist Preference

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Abstract: Japan has more than 6,000 small islands. However, almost all the islands do not have the resources for developing an industry. So, tourism business is important for most of these islands to generate revenues. At present, the decreasing number of tourist is causing problems to the tourism business of the island which is often used for recreation. It is necessary to formulate the measures for tourism promotion.. Therefore, the purpose of this study is to review existing strategies. Survey was conducted to propose the strategies for tourism promotion using Sado Island as a case study. In order to objectively propose strategies, analysis of tourist activities and preference was done using the tourist survey data. In this paper, we tried to analyze the transportation mode choice behavior by discrete choice model and visitor's preference by factor analysis and discriminant analysis. Based on the analytical results, several ideas for transportation improvement and boosting strategies of recreational spots were pointed out..

Key Words: *Island, Demand, Characteristics, Preference, Tourist*

1. INTRODUCTION

Japan is an island country and consists of four big islands (Hokkaido, Honshu, Shikoku and Kyushu) and more than 6,000 small islands (hereinafter the big islands are called mainland and the small islands are called island). Almost all of the islands do not have enough resources for industrial development. So, tourism is an important industry for most these islands.

Remote Island Promotion Law was enacted in 1953 in Japan. In conformity with the objective of this law, huge public funds have been invested as countermeasures for its isolation and inaccessibility. However, the population of island has been decreasing and almost all islands are now depopulated. Due to this, it is assume that there is a difference between the policy stated and how the political measures are applied. For example, the decreasing number of tourist is causing problems to the tourism business in Sado Island.

So, promotion of tourism demand is an important matter for an island. The aim of this paper is to discuss the methods for promoting tourism from the viewpoint of transportation service and marketing strategies.

In general, transportation cost to island is high because of additional cost to cross the sea. There are not enough transportation services and the fares are expensive in island. It seems that these are the disadvantages for increasing tourist demand in the island. It is therefore necessary to analyze the characteristics of the activities and the preferences of tourist in order to come up with better measures to promote tourism.

There are many transportation studies related to tourism. These studies can be roughly categorized into two kinds of studies. One, there are studies that focused on the demand estimation of tourist (for example, Morichi et al, 1985; Morichi et al, 1986; Morikawa et al, 2000). The other are the studies that focused on the tourists' behavior in the recreational area (for example, Morisugi et al, 1986; Tamura et al, 1988; Takahashi et al, 1990). The main target of these studies was to show the quantitative effect of the accessibility improvement to recreational spot/area. The importance of transportation in improving the attractiveness of recreational area was noted in these studies.

However, there are few studies focusing on tourism in isolated island. The feature of the island tourist is different from that of tourist in main land from the viewpoint of transportation studies. The transportation level of service in island is lower than that in main land. There is no railway service in isolated island. And, frequent service can not be expected because of low demand. So, number of alternatives mode for island tourist is limited. And those alternatives depend on their access mode to island. It is therefore necessary to understand the relationship between access mode choice behavior and tourism behavior in island.

One of the main targets of tourism behavior analysis is to make a proposal on how to connect the several recreational resources and spots by transportation system. However, there were few analyses done in understanding the attractiveness of recreational spot (Takahashi et al, 1990). Moreover the study on methods of promotion based on the evaluation of resources for recreation is also quite few (Okamura et al, 2007).

On the other hand, marketing strategies are necessary in establishing the tourist demand promotion. Usually, it is said in marketing science that concentrated announcement to the target market is one of the effective measures for promotion.

The other purpose of this study is to suggest tourism promotion measures for island recreational area based on behavior and preference of tourist through a case study.

This study aimed to show the following points in for the effective promotion of island tourism;

- 1) Transportation service provision based on understanding the island tourist's demand characteristics.
- 2) Evaluation on the characteristic of recreational spot/area and
- 3) Tourism promotion plan based on target market.

For this purpose, this paper shows the current status of case study area in chapter 2, summary of tourist survey in chapter 3. The characteristics of the tourists in the case study area are presented in chapter 4. Using this result, a way of concentrative announcement will be proposed. Chapter 5 provides the analysis on the relationship between travel behavior and transportation service and discussed the effective way for transportation service improvement. Chapter 6 discusses the target market for tourism promotion based on the analysis of the evaluation on the characteristics of recreational spots/area. Several analyses were done to reveal relationship between the attractiveness of recreational sports and the category of tourist who prefer to these recreational spots. Finally, conclusion and proposal for promotion of tourism in Sado Island are discussed in chapter 7.

2. THE CASE STUDY AREA: Sado Island

Sado is located in the middle-north part of Japan (figure 1). Transportation modes from the main land of Japan are only by ship and air plane. Jetfoil and ferry are the only transportation a passenger can use and are operated every hour. In September 2008, air transport ceased operation. At present, tourists have no other options but to use Jetfoil and/or ferry.

Sado Island has two famous recreational spots, Kinzan, a mountain where the gold can be dug out (figure 1.no.11) and forest park of Toki, which got its name from one of the precious bird in Japan, figures 1.no.12).

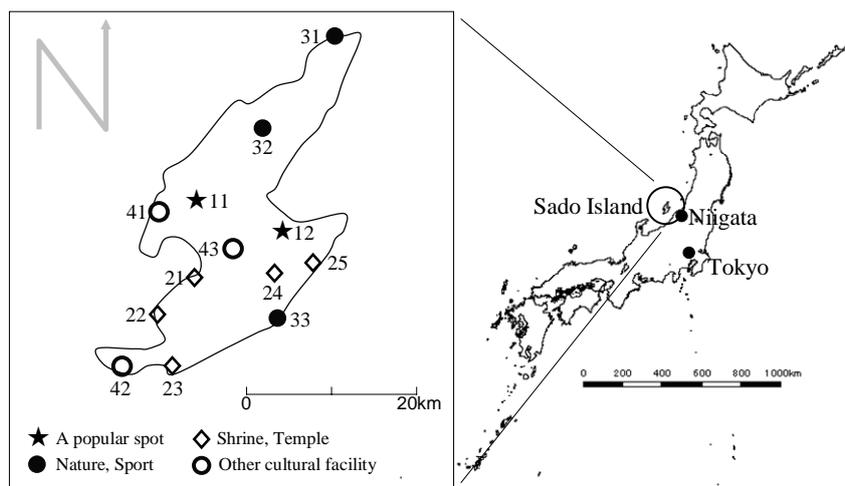


Figure 1 Map of Sado Island (Number in the map means spots which are explained in table 1)

Table 1 Name and outline of 13 spots of Scenic Byway project in Sado

No.	Recreational Category	Name of Spots	Outline of the Spots
11	Traditional spot	Kinzan	The mountain where gold can be dug out.
12	Traditional spot	Forest park of Toki	The breeding conditions of Toki are observed, and materials and an image can be read.
21	Shrine/Temple	Myosen-temple	The temple of "Nichiren- denomination". Important cultural property
22	Shrine/Temple	Renge-temple	It is called "hydrangea temple". It is specified in the important cultural asset of the country.
23	Shrine/Temple	Kaicho-temple	There are cherry blossoms Shunde which ex-emperor planted.
24	Shrine/Temple	Chokoku-temple	The place where Nichiren and Zeami visit. It is called "peony temple".
25	Shrine/Temple	Ushio-shrine	"Noh" is played regularly.
31	Nature, Sport	Futatsugame	It is famous as the beach.
32	Nature, Sport	Mt. Donden	The highland of about the height above sea level 900m.
33	Nature, Sport	Momiji-park	Red leaves (autumn colors) are beautiful in Autumn.
41	Other cultural facility	Hanga-museum	Block print by artist in Sado, themed on scene and genre.
42	Other cultural facility	Shukunegi	Historical port town. It is now streets preservation area
43	Other cultural facility	Hojo-residence	House of the 18th century latter half. Important cultural property

And now, the activity named “Scenic Byway project” is done in Sado Island for tourism promotion. Table 1 shows an outline and an easy explanation of the tourism spot that is the focus of this survey. In this, the tourism spots being paid attention to by this activity by some people are included besides famous spots. In this paper, these tourism spots were analyzed.

The total number of visitors to Sado Island have been decreasing yearly (figure 2). And some of the reasons were such as consummation of island boom and the harmful rumor due to the earthquake in 2004. Moreover, the lack of frequent transportation between main land and Sado Island is big problem which is also experienced by many recreational islands. The level of service between Sado Island and main land is shown in table 2.

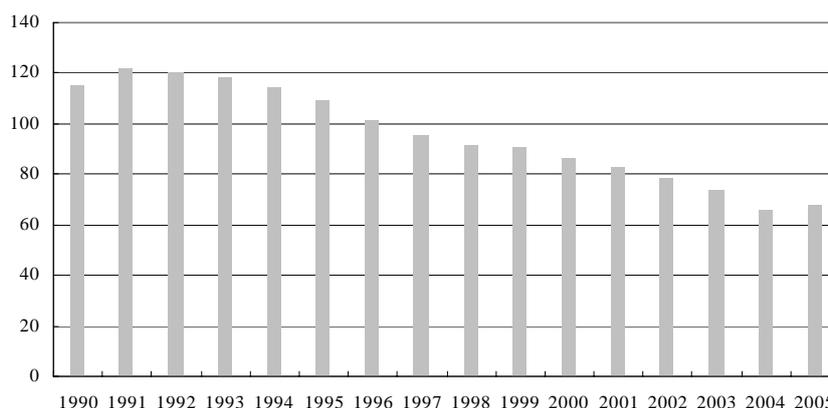


Figure 2 The change of the number of tourists to Sado Island (unit:10,000 people)

Table 2 Service Level of transportation between Sado Island and Main land (Niigata, nearest city from Sado Island)

Access Mode	Travel time (minutes)	Frequency (rounds/day)	Fare of round ticket		Fare of round ticket for private vehicle (yen)
			(yen)	(US\$)	
Jetfoil	60	10	11,490	128.1	-
Ferry	150	5	4,880	54.4	22,030
Air*	25	3-4	14,700	163.9	-

* Operation of Airline ended up on September 2008.

In Sado Island, there several transportation services for tourist, such as Route bus, rent-a-car, Tourism Bus and special taxi for tourist. Tourism Bus currently runs in four routes now with a fare around 4,800 yen per half day. Special taxi is the taxi like rent-a-car with driver and its fare is 7-8,000yen per day. Route Bus’s fare is dependent on the trip length. Fare of rent-a-car is 7,000yen per day. These fares are little bit high comparing with the fares in main land.

High fare of transportation service in island is one of the typical problems of transportation service of island area. So, prior measures to remove these kinds of barrier should be discussed. One of the measures is that the network of public transportation in Sado Island should be restructured from the viewpoint of tourist’s needs.

To remedy this situation, Scenic byway project by NPO operated by residents in Sado Island was developed and is currently working actively. The purpose of this project is to cope with changes in the tourist activities and intentions. Scenic Byway is a program aiming to offer attractive and distinctive recreational area. It intends to make a lasting impression on tourists.

It is considered to make full and sustainable use of local resources such as the landscape, nature, history, culture and recreation areas. This action should be implemented through conservation and improvement of local resources in cooperation with local communities and the administration.

In the case of Sado Island, the number of visitors of Kinzan and forest park of Toki had been decreasing. This could mean that attraction of these traditional recreational spots has declined. In order to promote of Sado Island, the linkage with other recreational spots becomes more important.

In this study, the transportation service and the attractiveness of recreational spots in Sado Island are main topics analyzed.

3. TOURIST SURVEY IN SADO ISLAND

For the purpose of this survey, a survey was conducted to understand the tourist activities and their preference on the most attractive recreational spots/area. Questionnaire was delivered to ship user at gate of the ship since most of tourist used the ship. This questionnaire is consisting of three parts.

Travel Activities: Travel schedule, Access mode, Main purpose/activity of travel, type and number of companion, Source of information on Sado Island, no of times a place/s in Sado Island was/were visited and activities at these places, transportation modes which was used in Sado Island, number of visits to each spots in past.

Evaluation on Recreational Spot: Satisfaction of travel, Intension level of revisiting to Sado Island, Satisfaction level of each visited spots, preference survey on intention of visit to 13 important spots (table 1) of Scenic Byway project.

Personal Profile: Age, Gender, Residence, number of times of visit to Sado Island and previous visiting date

All questions on the level of satisfaction or intention are measured using 1 to 5 scales.

Table 3 shows the summary and result of the survey. Figure 3 shows the proportion of respondents by the number of times of visiting to Sado Island. It is clear the share of first time visitor (beginner) is so big. This is one of the problems from the viewpoint of repeater promotion. 99 inhabitants return the questionnaire because we delivered to ship user.

Table 3 Survey summaries and result

DATE of survey	6,7,8,October,2007
Distribution place	Ryotsu port terminal (Sado City)
Collection	Post Mailing Post office
Object	Passenger of jetfoil and ferry
number of distribution	2,994
number of collection	790
Collection rate	26.9 %
Question item.	Travel activities Evaluation on recreational spots Personal profile

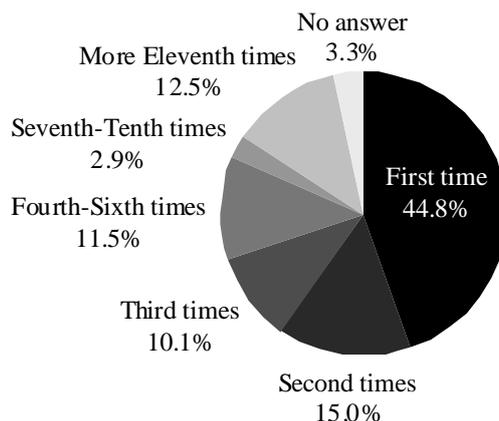


Figure 3 Rate of Visiting frequencies to Sado Island

4. CHARACTERISTIC OF SURVEY RESPONDENTS

In this chapter, the difference of activities of beginner and repeater is analyzed. Especially, it confirmed that the destination choice is influenced by experience of visit (number of visiting times to Sado Island). These should be necessary information to consider in the efficient strategy for promotion. Here, beginner means tourist who visit to Sado Island first time and repeater means tourist who visit one or more time in past.

4.1 Destination Choice Behavior of Tourist Beginners in Sado Island

For the Beginners, who visited Sado Island for the first time, it is important to target how to make them new repeaters. Figure 4 shows the Stop-over ratio of beginners (number of beginners stopping over in each spot / Total number of beginners) and accumulated ratio of this. From the figure, it is clear that 1) beginners' rate of visiting to Kinzan and Forest park of Toki are very high, 2) 90% of beginners visit certainly 6 spots ranked high. From these results, it is can be suggested that promotion activity to invite beginners to visit other spots should be done intensively at these 6 spots, because it is easy to catch the beginners who maybe become repeater.

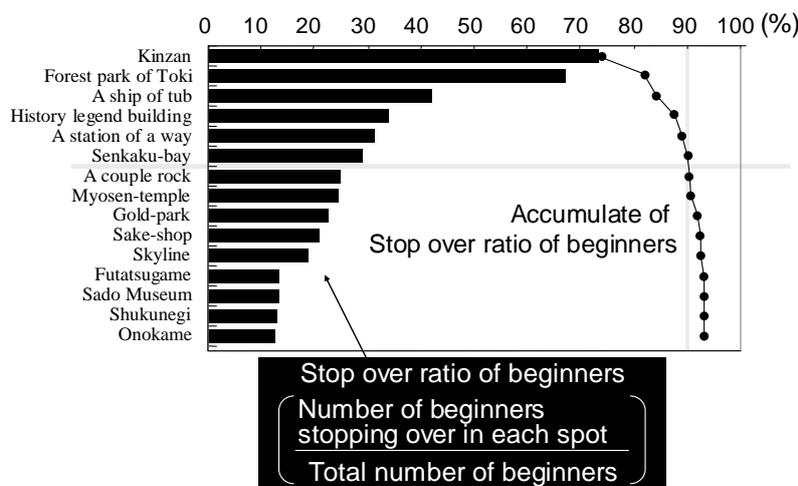


Figure 4 Rate of tourist's visits and the accumulated o number of main spots

4.2 Comparison of destination choice behavior of beginner and repeater

From the survey data, total 301 spots were chosen as destination by the travel activity data. To make easy comparison of behavior of beginner and repeater, 17 Areas were setup based on the location and these areas were named based on name of main spot of these areas (table 4). Table 4 also shows the visited ratio by beginner and repeater. It confirms that the beginners' visiting rate of Kinzan area and Toki area is especially high. Senkaku Bay area and Myosen-temple areas (around Kinzan area), Ogi area in the south exceed 50%.

On the other hand, repeaters tend to visit to the various areas. The concentration of the visit is seen only in Futatsugame area which is located at northern part of Sado Island. In this area, there are many places for enjoying water sports, such as fishing and scuba diving. Moreover there are many people who come for the purpose of viewing natural scenery. It shows that there are not only traditional recreational spots but also other attractive places. It can be effective to boost Sado as "Ocean and Nature Island".

Table 4 17 Recreational Areas and the Ratio of Visits by beginner and repeater

Area name	Visit rate(%)		Area name	Visit rate(%)	
	Beginner	Repeater		Beginner	Repeater
Futatsugame	19.12	25.19	Hatano	21.76	17.56
Sotokaifu	1.47	1.53	Toki	74.12	29.77
Uchikaifu	0.59	3.82	Kamoko	14.71	9.92
Donden	7.35	8.40	Myosen	57.94	26.72
Senkaku	43.82	14.50	Nishimikawa	20.00	9.92
Kinzan	75.88	33.59	Maehama	4.12	6.11
Nanaura	28.53	8.40	Akadamari	1.76	4.58
Sawada	16.47	9.16	Ogi	47.06	29.77
Kanai	8.82	3.82			

4.3 Comparison on number of visiting area of beginner and repeater

Figure 5 and 6 shows the distribution of visiting rate to area (figure 5) and spots (figure 6) of tourists categorized by number of visit to Sado Island. The average number of visiting area of beginner is 4.5 areas and repeater's mean is 2.6 areas. There is no significant difference. However, heavy repeaters, who have visited Sado Island seven or more times, tend to visit only 1 area specially (figure 5).

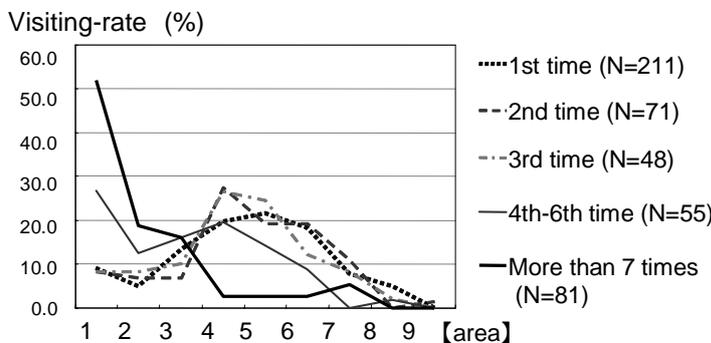


Figure 5 The comparison of the number of visiting area

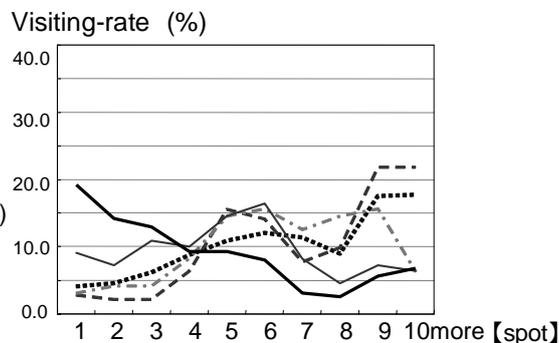


Figure 6 The comparison of the number of the visit points

As for the average number of the visiting spots, beginner's average is 7.0 and repeater's is 4.6 spots. There is significant difference. Figure 6 shows visiting spots number of visitors categorized by visiting times. It shows there is opposite tendency between beginner and repeaters. The summary of the following result is shown in the table 5.

Table 5 Ratio of number of visiting spots and areas

number of stop over areas	number of the visiting spots	beginner	repeater
1-3 areas (small touring)	Less than 6	20.9%	59.1%
	Greater or equal 6	3.0%	10.4%
4-6 areas (average touring)	Less than 6	7.6%	2.6%
	Greater or equal 6	55.8%	23.5%
7-9 areas (wide touring)	Less than 6	0.0%	0.0%
	Greater or equal 6	12.7%	4.3%

4.4 Summary of this chapter

The following things are observed as beginner's and repeater's characteristics;

- 1) There are two types of tourist, one who visits limited number of places and the other who visit many places. Specifically, a repeater tends to visit a limited number of places and beginner tends to visit many places.
- 2) However, 90% of beginners can be found in six famous spots (Kinzan, Forest park of Toki, Tub ship, History legend building museum, Sado Road Station, Senkaku Bay). This means that it is effective to give the information of other attractive spots to beginners at these six spots.
- 3) There is only one area where many repeaters visit, Futatsugame area. It should be an advantage for promotion of Sado Island.

5. ANALYSIS ON TRANSPORTATION MODE CHOICE BEHAVIOR

It was assumed that the infrequent transportation service is one of the reasons of decreasing demand to Sado Island as mentioned in Chapter 1. In this chapter, we would like to verify the possibility on demand promotion by transportation service improvement. For this purpose, important factors should be extracted by using the estimation result of transportation mode choice model.

5.1 Model Framework

As mentioned in chapter 2, visitors use various transportation modes in Sado Island. However, it seems that there is some limitation in choosing a mode going to the island. Figure 7 shows the tourists' modal split in island with their residential region. The share of the private vehicle is high in near Niigata and in the north part of Japan. It means the possibility that distance from Sado influence the choice of mode in island.

On the other hand, if visitor used railway to Niigata, one can not use private vehicle / charter bus in island. So, following model structure is hypothesized (figure 8). Using this structure, nested logit model is estimated. The result of estimation is shown in next chapter.

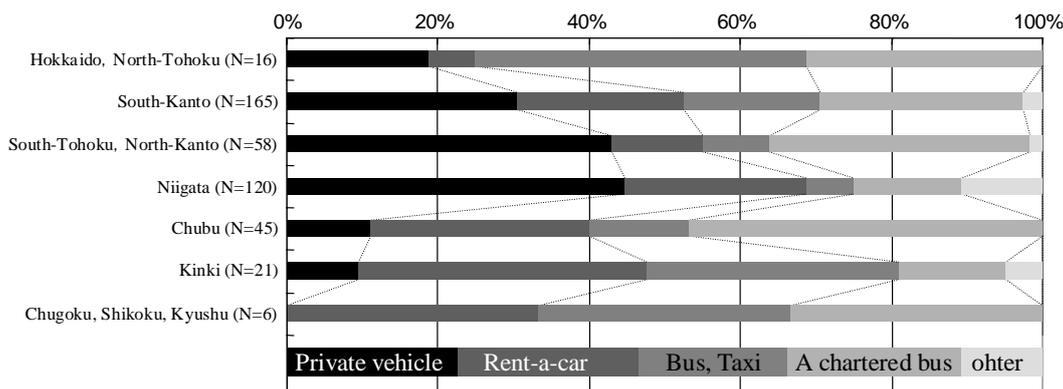


Figure 7 Tourists' Modal Split with their residential Area

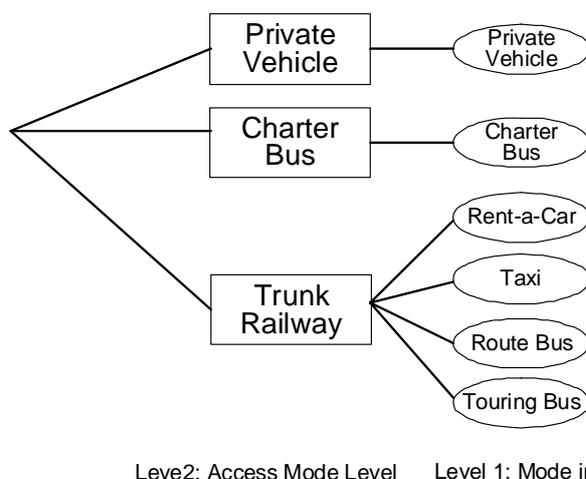


Figure 8 Model Structure of Transportation Mode Choice

5.2 Estimation result and suggestion on transportation improvement

Disaggregate Logit model using (pls write type) was used in the estimation to be able to understand what kind of transportation mode to be chosen by tourist in Sado Island. Using this model, the present condition can be evaluated. The study used nested logit model in estimating, (1) mode choice going to the island and (2) mode choice when in the island.

Results of the survey illustrating this were in chapter 4.

Table 6 shows the estimation result of this model. Common variables of the model are the travel time and total cost. Variables of age, the number of the accompanying person, the number of staying and the type of the trip are used as specific variables for access mode choice model. Most of the parameters are estimated, index of likelihood ratio and the hit ratio showed significant results.

From the result, it is understood that several variables is significant to explain the choice behavior. If tourist whose number of accompany person is less than three, he/her tend to choice rent-a-car,

Visitors, who visit with less than seven persons and stayed, more than two days, tend to choose private vehicle as access mode. Railway is chosen with tourists of free plan travel (non packaged travel) and age of 40's.

The estimation of the parameter of logsum variable in table 6(b) showed a positive sign which means that the, probability of choosing the railway as access mode will change with the improvement of service level of transportation in island.

From the sensitivity analysis of this model, most effective factor for access mode choice is the

shipping cost which is dependent on the distance from Sado Island. The fare of rent-a-car is also influential to the logsum variables which can be calculated using parameters of access mode choice model. It means there is the possibility that the improvement of transportation service in the island will improve the satisfaction of tourist in the island.

Table 6(a) Estimation Result of mode choice model [Level 1]

variables	In island	
	parameter	t-value
travel time in island touring [G]	-0.00001882	-1.8
travel cost in island touring [G]	-0.0001343	-2.3
constant [B]	-0.7737	-2.6
Dummy [Accompany < 3 persons] [RC]	1.046	3.9
# of samples	150	
Likelihood ratio	0.16	
Hit ratio	60.00%	

Notes: [B]: specific variable for Bus, [RC]: specific variable for Rent-a-car, [G]: Generic variable

Table 6(b) Estimation Result of Access mode choice model [Level 2]

variables	Access mode			
	model A		model B	
	parameter	t-value	parameter	t-value
Access travel time [G]	-0.003571	-2.4	-0.003973	-2.6
Access travel cost [G]	-0.00007619	-6.3	-0.00008129	-6.6
Dummy [Accompany < 7 persons] [PV]	1.3467	5.7	1.427	5.9
Dummy [Stay > 3 days] [PV]	0.6358	1.7	0.5568	1.0
Dummy [40's age] [R]	0.6503	2.2	0.5733	1.9
Dummy [free plan] [R]			0.06583	1.6
logsum [R]	0.9998	2.65	1.0289	3.4
# of samples	320		320	
Likelihood ratio	0.18		0.20	
Hit ratio	49.40%		55.00%	

Notes: [PV]: specific Variable for Private Vehicle, [R]: specific variable for Railway, [G]: Generic variable

6. ANALYSIS ON INTENTION TO REVISIT

The purpose of this chapter is to find the more attractive spots for visitor, especially for repeaters. At first, the difference of evaluation of recreational spots by respondents is analyzed (section 6.1). Here respondents are categorized by three groups depending on the frequency of their visit, such as beginner, repeater and inhabitant. Several comparison analyses with t-test are done about characteristics of recreational spots. Second, the factor analysis and discriminant analysis are done to bring out the target categories of the tourist for each spots (section 6.2 and 6.3). It will give the new marketing strategies of the Sado Island.

6.1 Difference in the intention based on the visitor character

In this chapter, the difference of the preference about recreational spots of inhabitant, repeater and beginner is analyzed. Here, answers toward the questions about the intention that respondent want to visit to any spots again. This intention is measured using 1 to 5 scale answers, 5 means respondent strongly want to visit the spot again and 1 means dose not want to visit ever. Intended spots of this question are 13 spots which shown in table 1. If respondents did not visit the spot before, respondent answer the intention to visit in future. Table 7 shows the scores evaluated by each categorized tourist, beginner, repeater and inhabitant. From this result, the followings are observed:

- Inhabitant gave high evaluation to the historical buildings.
- There are no spots which only repeater evaluated well.
- It means that if repeater gave one spot the high evaluation, that spot is also evaluated highly by other categories.
- Especially, repeaters high prefer natural scenic (Futatsugame, Mt. Donden) or historical and cultural spot (Renge-temple, Kaicho-temple).
- Evaluation and intention of beginner is influenced by the visibility because the imagination of these spots where they did not visit is not determined.

Table 7 Visit/Revisit evaluation by the spot (score)

	visit			re-visit		
	I	R	B	I	R	B
Kinzan	3.40	3.19	3.37	3.04	2.61	2.89
Hanga-museum	2.84	2.34	2.06	2.53	2.85	3.50
Myosen-temple	3.16	2.67	2.78	2.82	2.82	3.14
Renge-temple	3.03	2.50	2.43	3.34	3.23	2.89
Shukunegi	3.19	2.94	2.89	3.17	2.87	3.26
Futatsugame	3.53	3.25	3.21	3.54	3.50	3.56
Mt. Donden	3.37	3.29	2.55	3.48	3.18	3.76
Kaicho-temple	3.18	2.65	2.63	3.31	3.00	4.25
Hojo-residence	2.84	2.32	2.53	2.22	2.60	1.80
Toki	3.33	3.15	3.19	2.87	2.84	2.89
Ushio-shrine	2.78	2.41	2.56	3.11	2.38	3.11
Chokoku-temple	3.47	2.51	2.64	3.40	2.85	3.33
Momiji-park	3.43	2.92	3.00	3.18	2.79	4.25

Table 8 Visit/Revisit evaluation by the spot

Name of Spot	visit			re-visit		
	I	R	B	I	R	B
Futatsugame						
Mt. Donden						
Kaicho-temple						
Renge-temple						
Momiji-park						
Chokoku-temple						
Shukunegi						
Ushio-shrine						
Hanga-museum						
Kinzan						
Myosen-temple						
Toki						
Hojo-residence						
(■) means high evaluation (more than 3) (■) it is significant difference with other category						

Notes: [I]: Resident specific variable [R]: Repeater specific variable [B]: Beginner specific variable

Table 8 also shows the evaluation results. The mark in the table means that the group evaluates these spots as attractive spots. And dark mark means that there is significant difference of evaluation level between other tourist category groups. From the result of t-test on the visit evaluation and revisit intention, the spots can be classified to following 3 types.

type1) Spots with Good Evaluation

Futatsugame got the highest evaluation and intention by all categories. Kaicho-temple and Mt.Donden were also evaluated well. Local inhabitants and beginners evaluated Momiji-park highly. It seems that this spot have potential for new attractive spot.

type2) Spots with High Expectations

The intention to revisit Chokoku-temple and Shukunegi is higher than visit evaluation. There was no popularity in Ushio-shrine and Hanga-museum but the revisit intention is high. It is understood that expectation of these spots is persistent but visitors can not enjoy enough this time.

type3) Problematic Spot

The intention to revisit Kinzan and Toki are not good. Kinzan may be caught as a spot which satisfies it if it goes once under the present condition. The evaluation of these spots as well is low about the Hojo-residence, and it is necessary to improve these spots.

6.2 Classification by the factor analysis

In this section, the relationship between recreational spots and tourists' evaluation is analyzed using Factor analysis. Using variables of personal profile (gender, age), kind of travel (personal, group) and evaluation for each recreational spots, similarities of each spots can be found through Factor Analysis. Comparing of each factor parameters, it can be clear which kinds of tourist are attracted to which kinds of recreational spots. Table 9 shows the category scores for each recreational spots calculated by factor analysis.

Figure 9 plots the category scores calculated using the parameters of factor analysis, 1st factor score and 2nd factor score, 1st and 3rd factor score, to show the similarities of each recreational spots. It can be classified according to things which are similar depended on the intention of respondents.

It shows its position with the factor scores of Kinzan and Toki (specific for Kinzan-group), Futatsugame and Mt.Donden (specific for Futatsugame-group) are plotted respectively close to the near position. Kinzan-group is the representative spot of Sado and Futatsugame-group is well-liked spots by repeater. It is can be said, the museum, which is plotted at first quadrant, is the spot where tourist can enjoy the history and culture (25: Kinzan, 41: Hanga-museum, 43: Hojo-residence). Similarly, the spots where the visitor can enjoy sightseeing are plotted at the second quadrant (11: Kinzan, 12: Toki). It can confirm that the intention of visit and revisit is different by the character of the spot or activity of the tourist.

Table 9 Estimate value of category score

NAME	first axis	second axis	third axis
Kinzan	-1.642361	1.377165	-0.47523
Hanga-museum	1.05235	1.343648	3.360344
Myosen-temple	0.697811	0.041981	-0.629909
Renge-temple	0.806579	-0.136943	0.270666
Shukunegi	0.038382	-0.698595	0.36819
Futatsugame	-1.243323	-1.028854	0.335376
Mt. Donden	-0.973514	-1.58155	0.771883
Kaicho-temple	0.789126	-0.729303	-0.453995
Hojo-residence	1.197465	0.568184	-0.96124
Toki	-1.519632	1.788752	-0.222899
Ushio-shrine	0.922201	0.857966	-0.987141
Chokoku-temple	0.726582	-0.160579	-0.279251
Momiji-park	-0.07432	-0.658319	-0.690081
eigenvalue	0.0582	0.0354	0.0289
contribution ratio	21.90%	13.30%	10.80%
correlation coefficient	0.2413	0.1881	0.1699

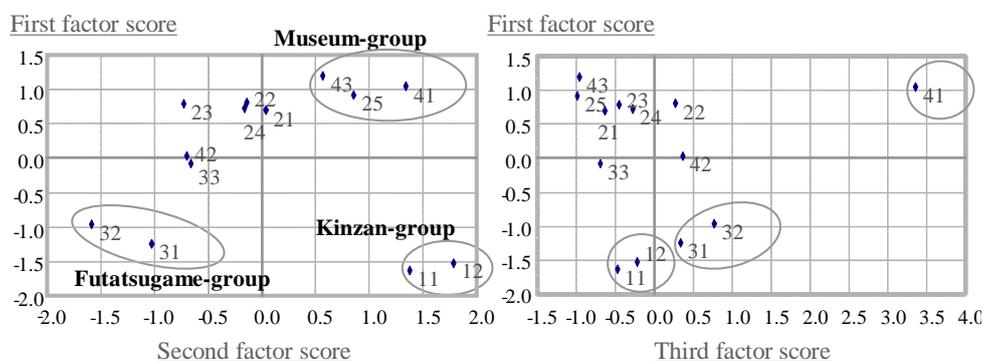


Figure 9 Category score point graph (Left: First-Second factor score, Right: First-Third factor score)

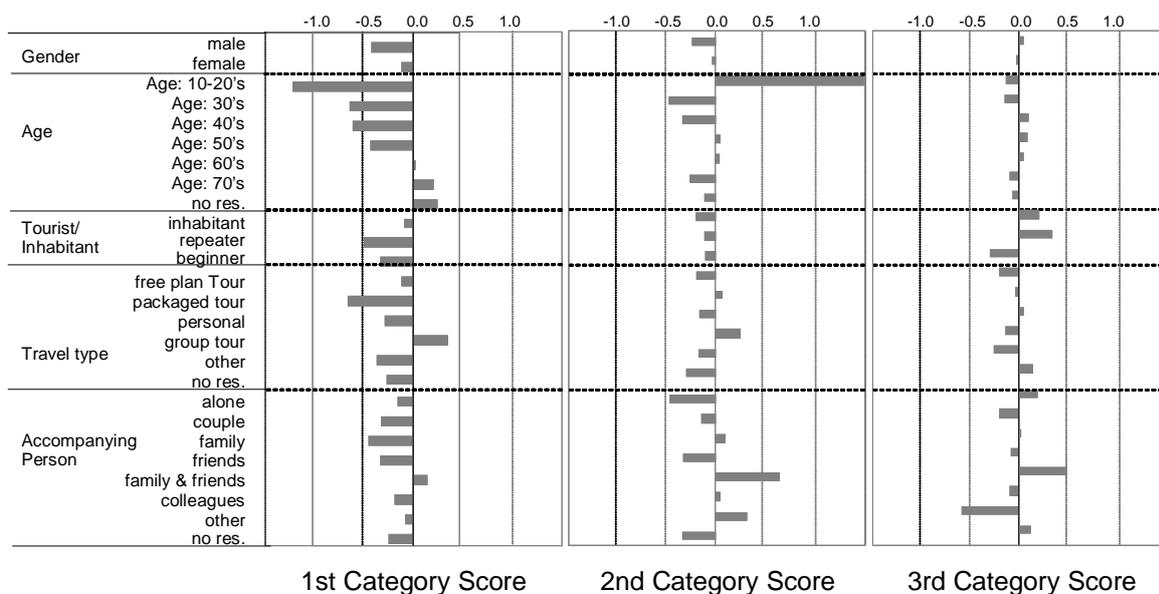


Figure 10 Mean point values of each category scores

Next, Figure 10 shows the median point value of each category for first, second and third category score. This shows the kind of visitor tend to have intention of visit and revisit.

From this figure and figure 9, the following can be pointed out:

- Young people tend to visit Kinzan-group
- Old people tend to prefer the minor recreational spot
- Many accompany group tend to visit to museums
- Visitor's Frequency influent the third category score.

6.3 Intention of visiting and revisiting to each spot

From the results of Factor analysis, it is found that these variables, which are used in Factor analysis, are important factors of the evaluation for each spots. In this chapter, discriminant analysis was applied to find the tourists' attributes affect the evaluation of the each spots.

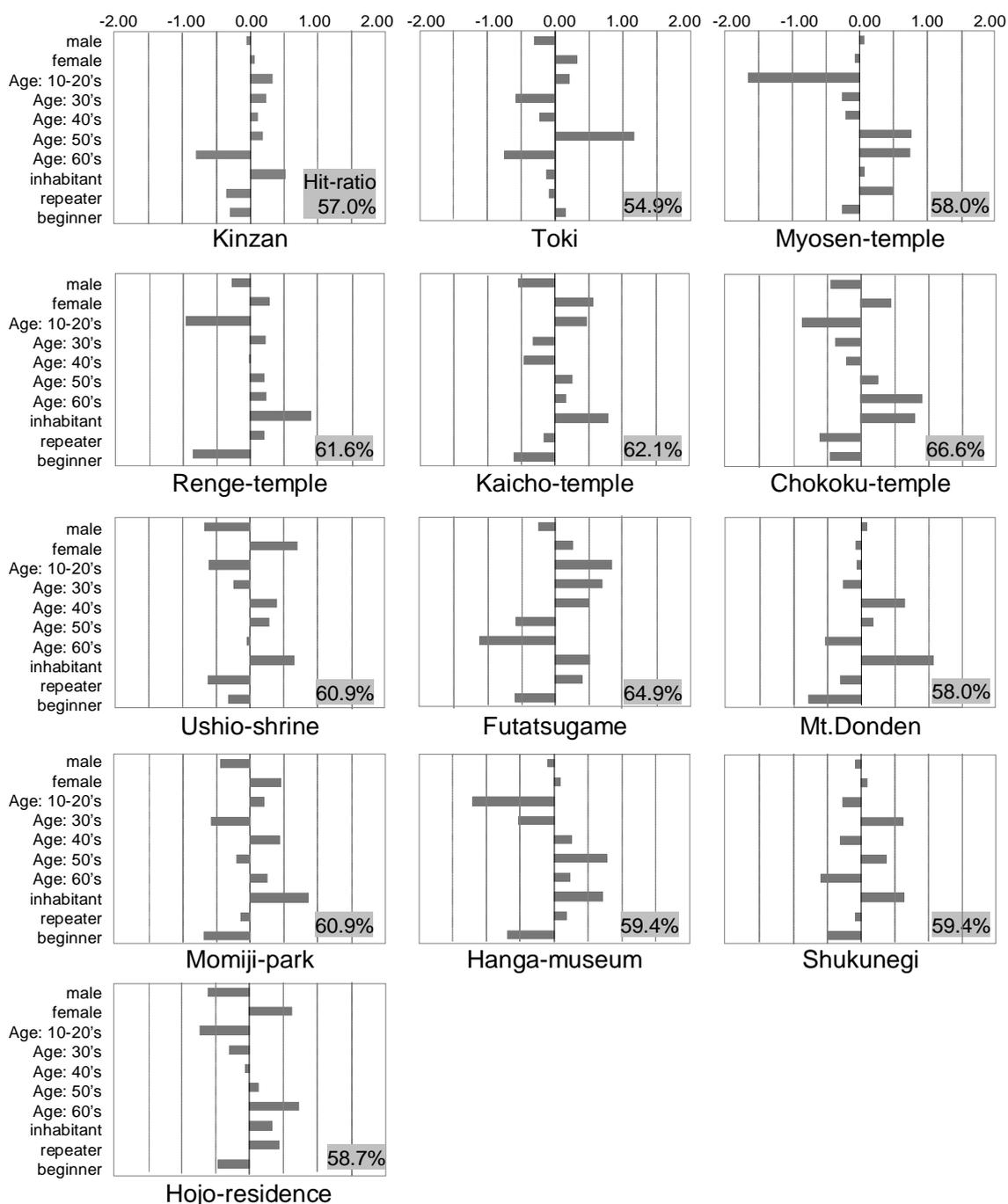


Figure 11 Medium point value calculated by discriminant analysis

Here, evaluation means tourists' evaluation for visit/re-visit preference.

Figure 11 is the result of discriminant analysis. It shows the intention of inhabitant is very high comparing with repeater and beginner. Museum, Choukokuji, Ushio-shrine and Shukunegi were also evaluated high by the inhabitants. It means that attractiveness of these spots is not popular yet.

Kinzan, Futatsugame, Shukunegi are highly popular in the young group (10's-30's), a museum and a temple are popular for teenagers. Toki is popularity in 10's -20's and the 50's, Momiji-park is liked in the wide generation. A shrine, Hojo-residence, Toki is liked mostly by women.

These results are good findings for consideration of strategies in promoting Sado.

7. CONCLUSION

There are two kinds of issues for the promotion of island tourism. One is the transportation to the island and in the island and the other one is marketing strategy to encourage tourists to the island. For these problems, this paper tried to analyze the transportation mode choice behavior by discrete choice model and visitor's preference by factor analysis and discriminant analysis.

The followings are the conclusion of these analysis and proposal for demand promotion in Sado Island.

1) Transportation Improvement

Nested Logit model, a choice model of transportation mode to the island and in the island, is estimated. Logsum variable is estimated as significant variable. It means that there is possibility to change visitors to use railway as access mode by improvement of transportation service in island. Further more, logsum variable calculated using parameters of choice model of transportation mode to the island is expected to greatly change when shipping cost from main land to Sado Island is improved. And also, change of rent-a-car fee and fare of touring bus can influence the logsum valuable. It means improvement in island transportation service will make Sado Island more attractive (section 5).

In the future, it is necessary to estimate destination choice model using this logsum variables. It will give the elasticity of these factors for total demand to Sado Island.

2) Findings for Promotion Strategies

Here, we summarize the results from the analysis on tourists' behavior and preference.

a) Tourists' Behavior (section 4)

From the results of aggregation of visitor's destination in Sado Island, it is found that 90% of beginners visit at least one spot of six popular spots. It means that it seems efficient and effective to boost other spots at these six spots. Also, it is found that there are a few attractive recreational spots where repeater prefers to visit. Futatsugame Area is one of the handful spots where many repeaters visit. It seems that this area should appeal widely to promote the demand. And its target is people who is under 50s generation and like water sports.

b) Tourists' and Inhabitant preference (section 6)

Factor analysis and discriminant analysis were done with the data of tourists' preference on the visiting intention. Data from inhabitant was used also here to compare the difference.

Following strategies can be considered based on the results of preference analysis using factor and discriminant analysis.

- Kinzan and Toki are popular spots. But, it is pointed out as problem that the

attractiveness for revisit is not high, especially to old generation or the elderly. However, it is also found that there are new needs to these spot by young generation and inhabitants. It shows the direction of promotion of these spots.

- Beginners have high intention to revisit to Myosenji, Chokoku-temple and Shukunegi. It means that measures to appeal these spots are effective for beginners.
- Inhabitant has high intention to visit and revisit to Momiji Mt. park and Kaicho-temple. Inhabitant may have much information about these spots. So, it means these spots have potential to court tourists to Sado Island.
- Futatsugame and Mt. Donden are preferred by both inhabitant and repeater. Especially 10's - 50's generation have intention to visit. These generations should be target for promotion to visit there.

This knowledge shows the target tourist for each recreational spots. Using this results, local governor or staff of Scenic Byway can consider the best way to appeal and inform new tourists.

It is hoped that these analytical approach and some ideas considered based on results of analysis will be of help for demand promotion for not only Sado Island but also for other recreational islands facing similar problems.

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