

## 2. Preliminary results on tourism and recreation study in the Lake Biwa region

Tamara V. Khantashkeeva

Institute of Geography, Russian Academy of Sciences, Moscow, Russian Federation

日本語による解説 谷内茂雄

### Tamara Khantashkeeva 氏について

Tamara Khantashkeeva氏は、ロシア科学アカデミー地理学研究所社会経済地理学部の首席研究員であり、「自然資源管理、経済地理学、観光とレクリエーションの地理学」を専門としている。2006年5月～12月の8ヶ月間、地球研の招聘外国人研究員として滞在し、「経済地理学、特にエコツーリズムの視点からの、琵琶湖の資源管理と環境保全」をテーマに、本プロジェクトに参加した。

### 本報告内容の概説

#### (1) 滋賀県のツーリズムとレクリエーション一般の現状分析

滋賀県の関係機関のインタビュー、公開文献資料の調査をもとに、滋賀県のツーリズム全般の傾向と特徴を整理した。その上で、滋賀県の市町村レベルで、ツーリズムの環境への影響を、3つの指標をもとに評価し、GIS（地理情報システム）で整理した。

#### (2) 滋賀県のアグロツーリズムのポテンシャル（潜在適地）評価

滋賀県の代表的なアグロツーリズムの拠点の視察、関係機関のインタビュー、文献資料調査をもとに、アグロツーリズムを類型化した。その上で、アグロツーリズムの潜在的なポテンシャル評価のための項目を設定し、項目ごとに指標を定め、主として既存の公開行政データを使って、市町村レベルで指標値を計算した。結果は、GIS上でポテンシャルマップ（潜在適地評価地図）として可視化した。

### 本研究の範囲

本報告は、タイトルが示すように、比較的短期間での試論の結果をまとめたものである。ツーリズムの影響の定義やポテンシャルの評価基準の分類・体系化、どのような指標をどのようなデータを使って評価するかについては、実際、大きな自由度があり、本報告で採用したのはそのひとつにすぎない。また、指標を計算する上では、適切なデータの選択が必要となるが、今回の報告では、市町村レベルで利用可能なデータがなかったり、時間がかかる等の理由で、いくつかの指標については、評価できないまま終了している。結果の統計的な検定・分析は、今後の課題である。

このように、本研究結果は、予備考察段階にあり、本報告も、あくまで試論の範囲である点に、ご注意いただきたい。しかし、本報告で導入された、GISを使ったポテンシャル評価という方法論は、手続きが明確であり、今後、環境と地域社会の持続可能性を考えるための具体的な手法のひとつとして、発展の可能性を秘めている。ここにご紹介する所以である。

## 第3節 社会文化システム班

## 1. Current state of tourism and recreational development in the Lake Biwa region.

## 1.1 General assessment of tourism and recreational development.

The Lake Biwa watershed is a productive ecosystem that provides a variety of goods and services, including recreational opportunities. On the basis of the results of interviews in the Shiga Prefectural Government commerce and tourism promotion division (June 20, 2006) and statistical data kindly supplied by staff [9,29,32], we performed a general qualitative and quantitative assessment of tourism and recreational development in the Lake Biwa region. Figure 1 illustrates the steady growth in the flow of tourists and visitors over the 25 years to 2004. The number of travelers increased by about 60% in the period 1979-2004, with an average annual growth rate of 2.4%. However, this was much lower than the average annual world tourism growth rate of about 20.2% in the same period (calculation based on World Tourism Organization statistics [6,34]). The recreational facilities are utilized mainly by the population of Shiga Prefecture, which accounts for more than 60% of the total number of tourists, or of neighboring prefectures such as Kyoto or Osaka. Daily leisure and day trips clearly predominate, accounting for 93.1% of the total number of visits. Although the number of travelers is increasing, the number of overnight stays has remained almost the same for the last 25 years. This has been mentioned by the Shiga Prefectural Government as one of the main economic problems of the local tourism industry.

The Lake Biwa region is involved only weakly in international tourism. In 2004 the number of foreign tourists as a proportion of the total number of travelers was only about 0.0026-much less than for Japan as a whole at 0.019 (calculation based on JTB Corporation statistics [35]). However, the number of foreign tourists has been steadily increasing for the last few years as a result of the international tourism promotion policy of Japan and Shiga (Figure 2). The average annual rate of growth in visits by foreign travelers was about

31.6% in 1996-2004 in Shiga-much higher than that of all tourists and visitors in the same period. Figure 2 demonstrates that in 1996-2003 the difference between the number of day trips and overnight stays by foreign visitors was not as large as in the case of all tourists and visitors, and in 2004 the number of overnight stays even exceeded the number of day trips. Thus, the development of international tourism may help to support the accommodation industry and increase the economic advantages flowing to the people of Shiga Prefecture from tourism and recreation.

The tourism product of Shiga Prefecture is mature and very diverse, and it can therefore satisfy a variety of demands. The Lake Biwa region provides opportunities for different kinds of tourism and recreation, including bathing, beachgoing, and sunbaking concentrated on the lake coasts; cultural enrichment (mainly in destinations that have famous temples, shrines, and castles); and finally sport and nature-based activities such as water sports, golf, tennis, skiing and skating, ecotourism, and rural tourism. According to available statistics, we can assume that pleasure travel constitutes about 55.2% of all travel purposes, followed by cultural travel with 20.2% and special events with 10.1% [32]. Other kinds of tourism and recreation constitute less than 7% each.

Seasonality in tourism and recreation is weakly expressed, unlike in other regions of the world (Figure 3); however, there are four main peaks correlated mainly with one-day trips (Figure 4): August, in association with the vacation season and weather conditions suitable for mass beach tourism; April-May and November, mainly in association with the best season for sightseeing; and January, in association with the tradition of visiting temples and shrines during the New Year holidays.

## 1.2 Tourism and recreation pressure on the environment.

Since our tourism and recreation research is related to the project about interaction between humans and nature in the Lake Biwa - Yodo River watershed, we evaluated some very general indica-



tors of tourism and recreation pressure on the environment in our study area. Using the methods presented in the book *Biodiversity and Tourism: Conflicts on the World's Seacoasts and Strategies for Their Solution* (1997) [6] we measured three indicators: "tourism and recreation intensity", "density of accommodation facilities", and "rate of increase in the number of tourists and visitors". We calculated the tourism and recreation intensity as the number of tourists and visitors per sq. km of land area. Accommodation facility capacity (maximum number of occupants at any one time) per sq. km of land area was used as a measure of the density of accommodation facilities. This calculation was done from available data on the capacity of private and public hotels, home-stays, and camping facilities [9]. We calculated the rate of increase in the number of tourist and visitors over the 10 years from 1994 to 2004 (%). Both quantitative and qualitative assessment of these indicators was done. A six-graded scale was developed for the qualitative assessment of these indicators in each city and town area. The decision on the number of grades

and measurement of the intervals between them was made on the basis of Sturges's Formula and the recommendations for its application to statistical analyses [30]. Qualitative assessment (in grades) of tourism and recreation pressure on the environment in city and town areas was calculated as the sum of qualitative assessment of the three indicators: "tourism and recreation intensity", "density of accommodation facilities", and "rate of increase in number of tourist and visitors". For this purpose we (1) converted the grades of these indicators into standard units: maximum 6, very high 5, high 4, medium 3, low 2, and very low (or decrease) 1, and we calculated the tourism and recreation pressure on the environment as the sum of these three indicators in standard units. Finally, we made qualitative assessments (gradings) of city and town areas according to the tourism and recreation pressure on the environment. The research results are presented in the matrix Table 1 and in Maps 2-5.

Tourism and recreation intensity. In a very broad sense (Map 1) tourism intensity is correlat-

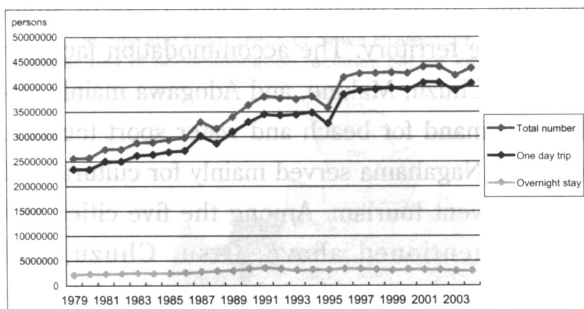


Figure 1. Number of tourists and visitors in Shiga Prefecture, Japan (1979-2004).

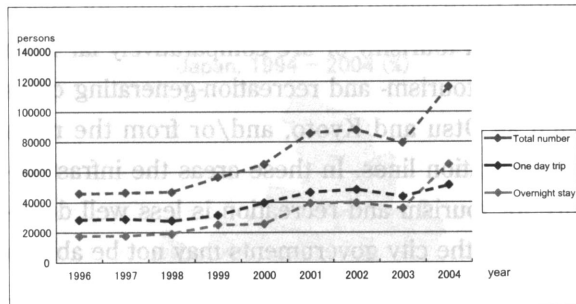


Figure 2. Number of foreign tourists and visitors in Shiga Prefecture, Japan (1996-2004).

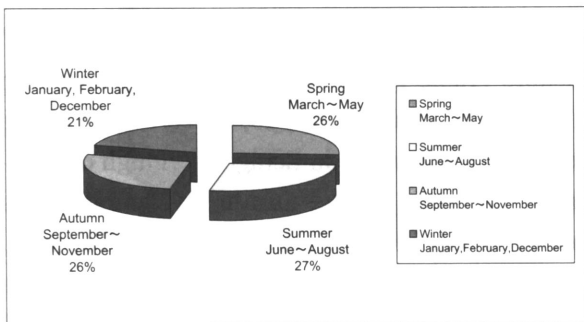


Figure 3. Seasonal shares of tourists and visitors in Shiga Prefecture, Japan (% , 2004).

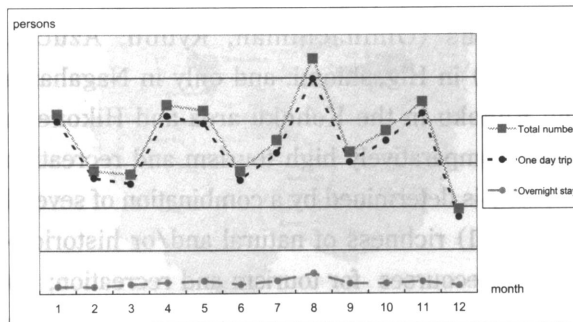


Figure 4. Monthly numbers of tourists and visitors in Shiga Prefecture, Japan (2004).

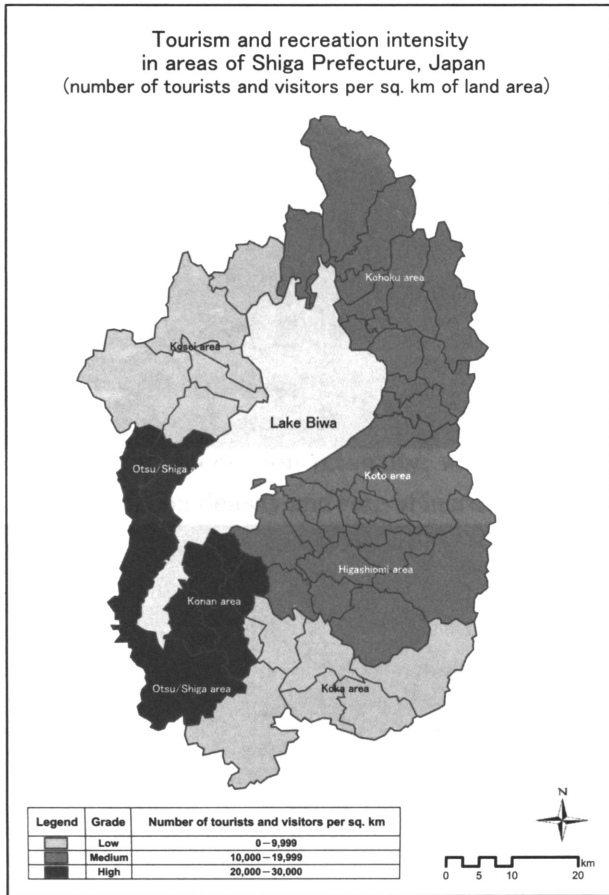
ed with the territory's level of socioeconomic development: the most intensive tourism and recreation occurs in the Otsu/Shiga and Konan areas, which have the highest population density and the lowest proportion of land covered by forests and mountains; low tourism intensity is observed in the comparatively sparsely populated Kosei and Koka areas, which are mainly covered by forests and mountains. Quantitative assessment of this indicator in the towns and cities, presented in Table 1 and Map 2, demonstrates that the tourism intensity in Shiga Prefecture varies greatly. The difference between the maximum (106,802.1 persons per sq. km in Nagahama) and minimum (276.2 persons per sq. km in Torahime) values of this parameter is about 386.6 times. This may be explained by the large differences in the level of towns' and cities' involvement in the tourism industry and by the inequality of tourism and recreation development in the Lake Biwa region. About 59.3% of Shiga Prefecture territory characterized by very low or low tourism intensity is weakly involved in tourism and recreational development. These cities and towns either have poorer recreational resources (especially for beach or cultural tourism) or are comparatively far from the main tourism- and recreation-generating cities such as Otsu and Kyoto, and/or from the main transportation lines. In these areas the infrastructure for tourism and recreation is less well developed and the city governments may not be able to afford to promote tourism and recreation. Maximum, very high, and high tourism intensities account for about 21.4% of the total area and are observed in the cities and towns of the Otsu/Shiga and Konan (except of Ritto) areas, in four cities and towns (Omihachiman, Ryuoh, Azuchi, Gokasho) in Higashiomu, and only in Nagahama and Kohoku in the Kohoku area and Hikone in Koto. Comparatively high tourism and recreation intensity is determined by a combination of several factors: (1) richness of natural and/or historical-cultural resources for tourism and recreation; (2) favorable locations of transport in relation to tourist attractions, and existing infrastructure for tourism and recreation; and (3) the ability of

municipal governments to afford to promote tourism and recreation. Factors 1 and 2 apply to the cities and towns of the Otsu/Shiga (Photos 1-4) and Konan areas, which possess good beaches, possibilities for recreational water sports, favorable locations of transport, and good infrastructure for tourism and recreation. Factor 3 is exemplified by Nagahama and Ryuoh, whose high tourism intensity is the result of not only the presence of existing resources for natural or historical-cultural tourism, but also a tourism policy that has been successfully implemented by local governmental bodies.

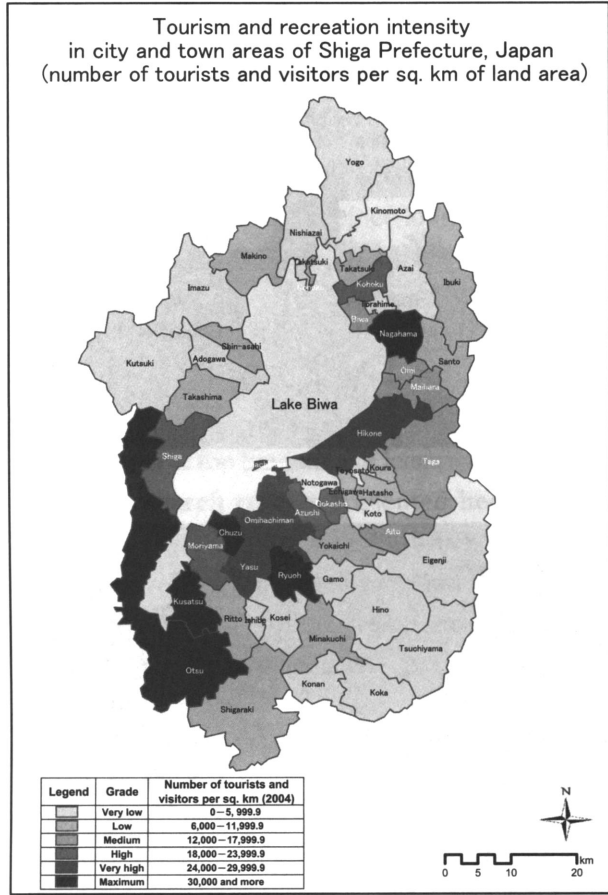
The density of accommodation facilities (Table 1, Map 3) varied in our study region from 113.8 per sq. km in Chuzu to a lack of accommodation facilities (or lack of information about such facilities) in Ishibe, Kosei, Gokasho, Aito, Notogawa, Gamo, Azuchi, Echigawa, Toyosato, Hatasho, Koura, Maihara, Omi, Azai, Biwa, and Takatsuki. Accommodation facilities -major elements of tourism infrastructure- were concentrated mainly in five towns and cities: Otsu, Chuzu, Nagahama, Makino, and Adogawa. These possessed high, very high, or maximum densities of accommodation facilities and accounted for about 12.3% of Shiga prefecture territory. The accommodation facilities in Otsu, Chuzu, Makino, and Adogawa mainly satisfied demand for beach and water sport tourism, whereas Nagahama served mainly for cultural and special event tourism. Among the five cities and towns mentioned above, Otsu, Chuzu, and Nagahama possessed both high tourism intensity and high accommodation density grades. About 71.1% of the total Shiga prefectural land area has either a very low (including absence) or low density of accommodation facilities.

The rate of increase in the number of tourist and visitors (Table 1, Map 4) in Shiga Prefecture from 1994 to 2004 varied from a 45.6% decrease in Ishibe to a 2304.8 % increase in Echigawa. A high or maximum increase in the number of vacationers occurred only in Chuzu, Aito, Echigawa, Toyosato, and Torahime (6.2% of total area), whereas a decrease was observed in 12 towns and cities (21.9 % of total area) and a low increase in 27 (53.9%).

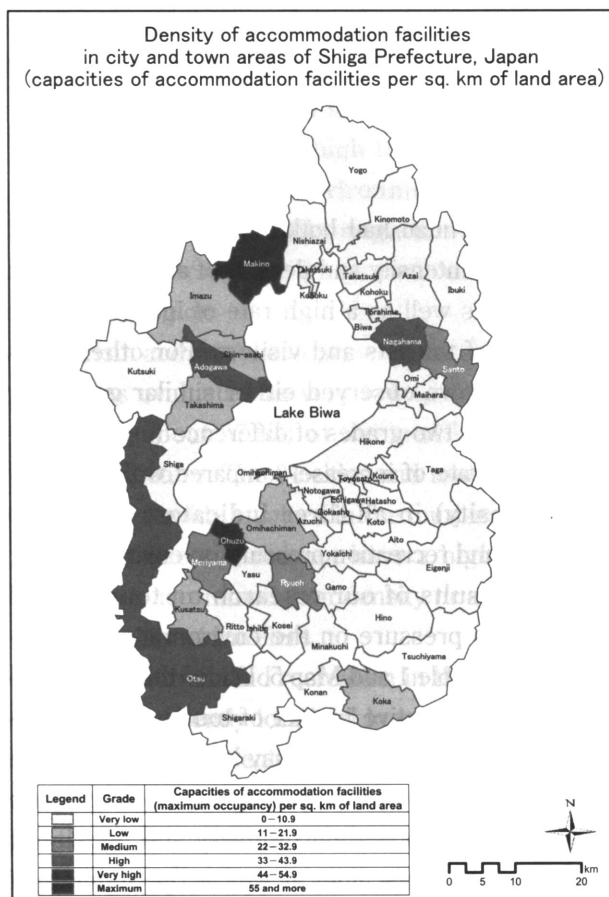
Town and city areas like Otsu, Shiga, Hikone,



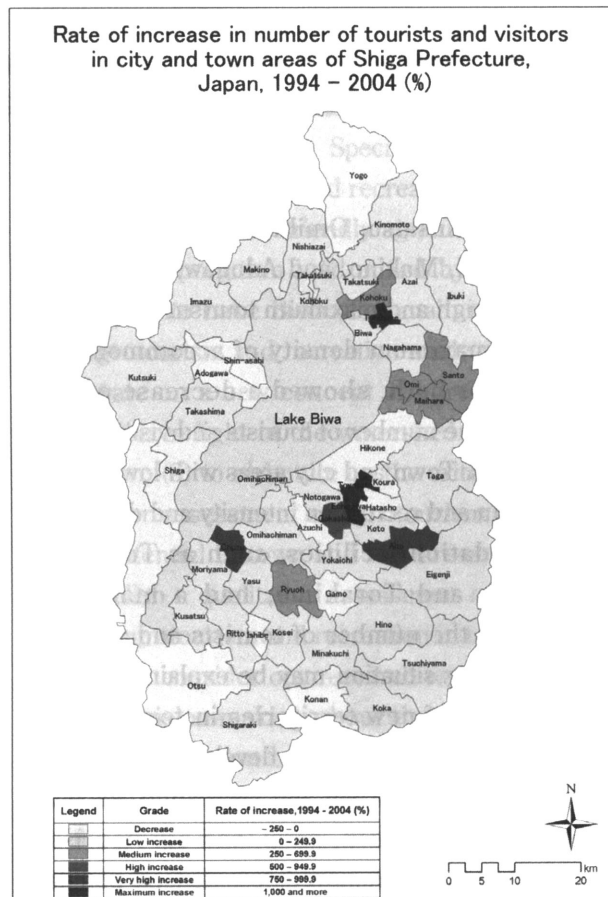
Map 1.



Map 2.



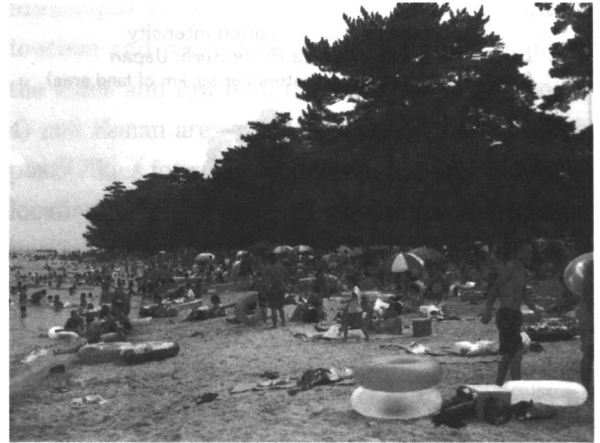
Map 3.



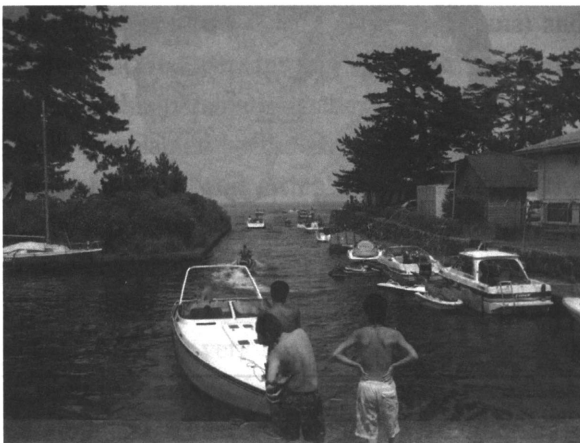
Map 4.



1



2



3



4

Photos 1-4. Omimaiko (Otsu/Shiga area) is a popular destination in the Lake Biwa region for mass beach and watersport tourism and recreation (August 13, 2006).

Nagahama, Kusatsu, Omihachiman, Moriyama, Yasu, Azuchi, Makino, and Adogawa with either high, very high and maximum tourism intensity or high and maximum density of accommodation facilities, or both, showed a decrease or low increase in the number of tourists and visitors over the 10 years. Town and city areas with low or very low tourism and recreation intensity and density of accommodation facilities, such as Toyosato, Echigawa, and Torahime, had a maximum increase in the number of tourists and visitors. This opposing situation may be explained by the involvement of new territories in tourism and recreation, as well as by the development of alternatives to mass tourism and recreation, such as ecotourism and green, rural, and agrotourism, mainly in the more removed, less densely populat-

ed areas. Chuzu had both maximum tourism and recreation intensity and density of accommodation facilities as well as a high rate of increase in the number of tourists and visitors. For other cities and towns we observed either similar grades or only one or two grades of difference (usually higher in the rate of increase compared with intensity and density) in all three indicators related to tourism and recreation pressure on environment.

The results of our research on tourism and recreation pressure on the environment are presented in Table 1 and Map 5. Under the current situation the negative impact of tourism and recreation on the environment may be a problem in the future only in Chuzu, owing to the maximum tourism and recreation intensity and density of accommodation facilities as well as the high rate of

increase in the number of tourists and visitors. In Otsu, Nagahama, and Ryuoh, tourism and recreation pressure on the environment was evaluated as comparatively very high. Although there has been a decrease in the number of travelers to Otsu and a low increase in Nagahama, some ecological problems may occur in these areas future owing to the maximum tourism intensity and high accommodation density. In Ryuoh the very high grade of tourism and recreation pressure on the environment can be explained mainly by the maximum tourism and recreation intensity, whereas the accommodation density and rate of increase in the number of tourists and visitors were of medium grade. High tourism and recreation pressure on the environment was observed in Makino, Echigawa, Omihachiman, Moriyama, and Kusatsu. The high grading of Makino can be explained by its maximum accommodation density and those of Kusatsu and Omihachiman by their maximum and very high tourism intensities, respectively; the other two indicators for these territories were graded low or very low. Moriyama had a high tourism intensity and medium density of accommodation facilities but a low rate of increase in the number of tourists and visitors. More research at the micro level is needed in future in areas with maximum, very high, or high tourism and recreation pressure on the environment in order to investigate the possible negative impacts of tourism and recreation on the environment of the Lake Biwa region.

Tourism and recreation pressure on the environment was evaluated as very low or low in more than half (about 57.5%) of the total land area of Shiga Prefecture. The 31 cities and towns in these areas were weakly involved in the tourism industry and, consequently, did not have a high tourism intensity or accommodation density or an increase in the number of travelers.

Finally, tourism and recreation in the Lake Biwa region are currently localized in certain areas that are mainly (but not entirely) near Lake Biwa. Their tourism and recreation pressure on the environment was evaluated as maximum, very high and high and they occupy in total about 16% of Shiga

Prefecture. These cities and towns possess comparatively rich natural and cultural resources for tourism and recreation, their infrastructure for tourism is comparatively well developed, and their tourism products are well promoted. These areas will need to be monitored, since tourism and recreation are placing additional pressure on them and most of them are already highly populated. Ecological problems are unlikely to be a problem posed by tourism in about 57.5% of the total area of the prefecture, owing to the weak involvement of these areas in the tourism and leisure industry.

The research results presented here may be useful for the monitoring of tourism and recreational development in the Lake Biwa region. They may also contribute to the search for not only economic, but also ecological, perspectives for tourism.

## 2. Spatial study of agrotourism and recreation.

### 2.1 Introduction

Keeping in mind not only the economic future of tourism but also the watershed sustainability paradigm, we are seeking alternatives to mass tourism and recreation that can not only satisfy the demands of tourists but also support local communities and help improve the Lake Biwa - Yodo River watershed environment. Specifically, we are seeking to develop tourism and recreation that can support environmentally friendly agriculture and thus reduce the pollution load posed by agricultural drainage into Lake Biwa. The main objectives of our agrotourism and recreation study were: (1) to elaborate on a new concept of agrotourism and recreation in light of the watershed sustainability paradigm; (2) to elaborate on the criteria and indicators for assessment of agrotourism and recreation potential in town and city areas; and (3) to accomplish a qualitative assessment of the potential for agrotourism and recreation in town and city areas. We consider our research to be a contributor to decision-making about the future perspectives of interaction between tourism and agriculture, with the ultimate goal of achieving sustainability of the rural communities and the environment in the Lake Biwa watershed.



## 2.2 Agrotourism and recreation: definition and concepts

Various terms have been used to refer to the concept of "agrotourism". These include agricultural tourism, farm tourism, farm vocation tourism, agritourism, and agri-entertainment. [1,10,13,14,33]. In spite of the diversity of terms and definitions used, there are a number of basic common elements in the traditional agrotourism concept (Figure 5): (1) agrotourism is a part of rural tourism and occurs in rural areas; (2) agriculture is the main activity of agrotourists; and (3) tourist services are usually supplied by farm families. These preceding studies are excellent and informative, with their own merits, but they are based mainly on the agrotourism experience in European and North American countries. Taking into consideration the purpose of our research and the specific features of our study area, we developed a new concept of agrotourism and recreation (Figure 6). This concept is based on:

1. Traditional concepts of tourism and recreation as well as agrotourism.
2. The current status of Japanese rural tourism and recreation in which agriculture is the main activity. The main features specific to these types of tourism and recreation are: (1) predominantly daily leisure or daily leisure trips combined with agricultural experience, unlike the overnight farm stays in Europe and North America; and (2) orientation of the agrotourism market mainly toward local residents or people living in Shiga or neighboring prefectures, as

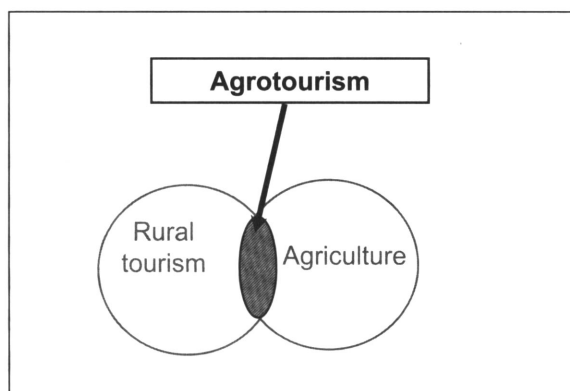


Figure 5. The traditional concept of agrotourism

opposed to the situation in other Asian countries, where agrotourism is oriented mainly toward international agrotourists.

3. The specific location of the study area in the Lake Biwa watershed and the need to improve the Lake Biwa - Yodo River watershed environment by means of environmentally friendly agriculture.

Thus, keeping in mind the watershed sustainability paradigm, agrotourism and recreation may be defined as a combination of: (1) a variety of environmentally friendly agricultural activities in a healthy rural environment during leisure time; and (2) the products of environmentally friendly agricultural operations combined with a tourism and recreation experience (Figure 6). On the basis of the definition of potential for tourism and recreation [18, 23], potential for agrotourism and recreation can be defined as the totality of existence, in city or town areas, of natural, cultural, and socioeconomic prerequisites.

## 2.3 Study area

At a macro scale the study area was located in the Lake Biwa watershed and comprised the prefecture of Shiga, Japan. Fifty cities and towns (before the merging of municipalities on 1 January 2005) in Shiga Prefecture with a population about 1.4 million were the objects of the investigation at the meso level. Six main types of agrotourism and recreation unit<sup>1)</sup> can be distinguished in Shiga Prefecture on the basis of field studies in city and town areas:

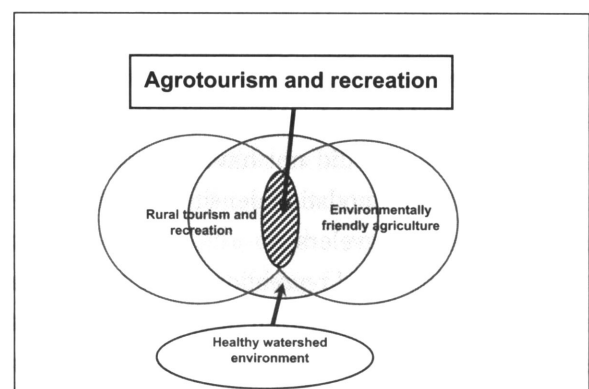


Figure 6. Concept of agrotourism and recreation in light of the watershed sustainability paradigm



1) Units (usually farm guest houses) that offer true agrotourism services, such as accommodation and catering and leisure activities. These services are generally offered by farm families, and agriculture is the main activity. Such examples can be found in the town of Makino, where about 30 farm families are involved in agrotourism.

2) Units, usually located in terraced paddy and vegetable fields, where the general public (usually city dwellers) can co-own land and grow their own rice or vegetables for pleasure, thus having the chance to procure and enjoy self-made ecological products. There are examples of type 2 in the city of Hikone, the town of Aito (Photo 6), and the settlements of Hata (Photo 5) and Ukawa around the town of Takashima.

3) Agrogardens ("pick-your-own" farms) where people can enjoy and experience agriculture by picking their own fruit, nuts, and vegetables. Good examples are: the Makino pick-your-own farm in the city of Nagahama, where people can pick cherries, blueberries, apples, chestnuts, and grapes (Photos 7,8); the blueberry gardens in the city of Maibara; and the peach and grape gardens in the town of Ryouh.

4) Direct sales outlets and displays of agricul-

tural products, usually with catering centers, i.e. places where farmers sell fresh agricultural products direct to the consumer. These outlets provide visitors and tourists with opportunities to experience and enjoy a broad spectrum of agriculturally-based local products and services (Photos 9,10). Such examples can be found in many places in Shiga Prefecture, such as in the Inae district in the city of Hikone, and in the towns of Makino and Aito.

5) Units in paddy or other agricultural fields where people (usually local school students) can gain first-hand experience of agriculture. Classes on environmentally-friendly agriculture are usually organized by local farmers.

6) Agroparks with leisure activities of the "agrotourism" type, but with weak links to local farming production and rural culture. There are examples of type 6 at Shiga Agricultural Park in the town of Hino. Shiga Agricultural Park's "Blumen Hügel" is a project completed with the cooperation of the Hino town government, the Shiga Prefectural Government, and the national government (Photos 11-16). This tourist spot integrates agriculture, tourism, and the culture of Bavaria, Germany.



Photos 5. The village of Hata, with its scenic terraced paddy fields, is one of the best places in Shiga Prefecture to see traditional agricultural landscape and culture (July 19, 2006).



Photos 6. Vegetable fields in the town of Aito, where members of the public (usually city dwellers) co-own land and grow their own vegetables for pleasure, experience, and the chance to obtain home-grown ecological products (July 29, 2006).



7



8

Photos 7,8. A pick-your-own farm at Makino where people can enjoy picking cherries, blueberries, apples, chestnuts, and grapes (July 22, 2006).



9



10

Photos 9,10. Direct sales outlets in Shiga Prefecture provide visitors and tourists with opportunities to experience and enjoy a broad spectrum of agriculturally-based local products and services.

#### 2.4 Materials and methods

Basically, to investigate the potential for agrotourism and recreation in town and city areas we performed a qualitative recreational assessment of territory. The choice of this method was determined by its suitability for comparison of the agrotourism and recreational potentials of town and city areas. This method is widely used in the geography of tourism and recreation in Russia and is covered in the literature [20, 21]; it has been applied to the qualitative assessment of potential for tourism and recreation in the Lake Baikal region [16, 17]. The town and city areas of Shiga Prefecture were the objects of our assessment, and the subjects of the assessment were organizers of agrotourism and recreation (e.g. businesspeople

and representatives of rural communities or government bodies). The main objective of the qualitative assessment was to determine the range of suitability of cities and towns for the organization of agrotourism and recreation. Our method consisted of several steps (stages):

1. On the basis of (1) a new concept of agrotourism and recreation, (2) definition of the potential for agrotourism and recreation, and (3) determination of the town or city characteristics considered important prerequisites for agrotourism and recreation organization, we defined criteria groups and criteria for each group in order to assess the agrotourism and recreational potential of the town and city areas in Shiga Prefecture (Figure 7). Among our research crite-



11



12



13



14



15



16

Photos 11-16. Shiga Agricultural Park's "Blumen Hügel" project in the town of Hino in Shiga Prefecture was completed with the cooperation of the town and national governments.

ria were scientific requirements that defined existing prerequisites for agrotourism and recreational development on which decisions concerning the potential for agrotourism and recreation in these areas could be based.

2. We found appropriate indicators and measurements that met the criteria for the assessment of agrotourism and recreation potential. Indicators were converted into indices with values ranging from 0 to 1. Measurement of a particular index was done by linear scaling methods, which permitted us to trace the dynamics of real rises and falls for each indicator relative to the maximum and minimum values of the indicator in the study area.
3. Integral indices (IA, IB, IC, ID) of the potential for each agrotourism and recreation criteria group (A,B,C,D) in city and town areas were calculated by the formulas:

$IA = 1/2\{I_{A1} + 1/2(I_{A2} + I_{A3})\}$ , where  
 IA=integral index of indicators related to the group of criteria "natural resources for agrotourism and recreation" (A group of criteria).  $I_{A1}$ ,  $I_{A2}$ ,  $I_{A3}$ =indices of indicators related to the A

group of criteria (Table 2).

$IB = 1/3\{I_{B1} + (1 - I_{B2}) + (1 - I_{B3})\}$ , where  
 IB=integral index of indicators related to the group of criteria "agricultural health and healthy environment of rural areas" (B group of criteria).  $I_{B1}$ ,  $I_{B2}$ ,  $I_{B3}$ =indices of evaluative indicators related to the B group of criteria (Table 2).

$IC = 1/2\{I_{C1} + 1/2(I_{C2} + (1 - I_{C3}))\}$ , where  
 IC=integral index of indicators related to the group of criteria "human resources for agrotourism and recreation" (C group of criteria).  $I_{C1}$ ,  $I_{C2}$ ,  $I_{C3}$ =indices of indicators related to the C group of criteria (Table 2).

$ID = 1/2\{I_{D1} + I_{D2}\}$ , where  
 ID=integral index of indicators related to the group of criteria "current state of agrotourism and recreation development" (D group of criteria).  $I_{D1}$ ,  $I_{D2}$  = indices of evaluative indicators related to the D group of criteria (Table 2).

4. Qualitative assessment (in grades) of the potential for each agrotourism and recreation criteria group in city and town areas was done. We applied Sturges's Formula [30] to decide on the number of grades and measure the interval

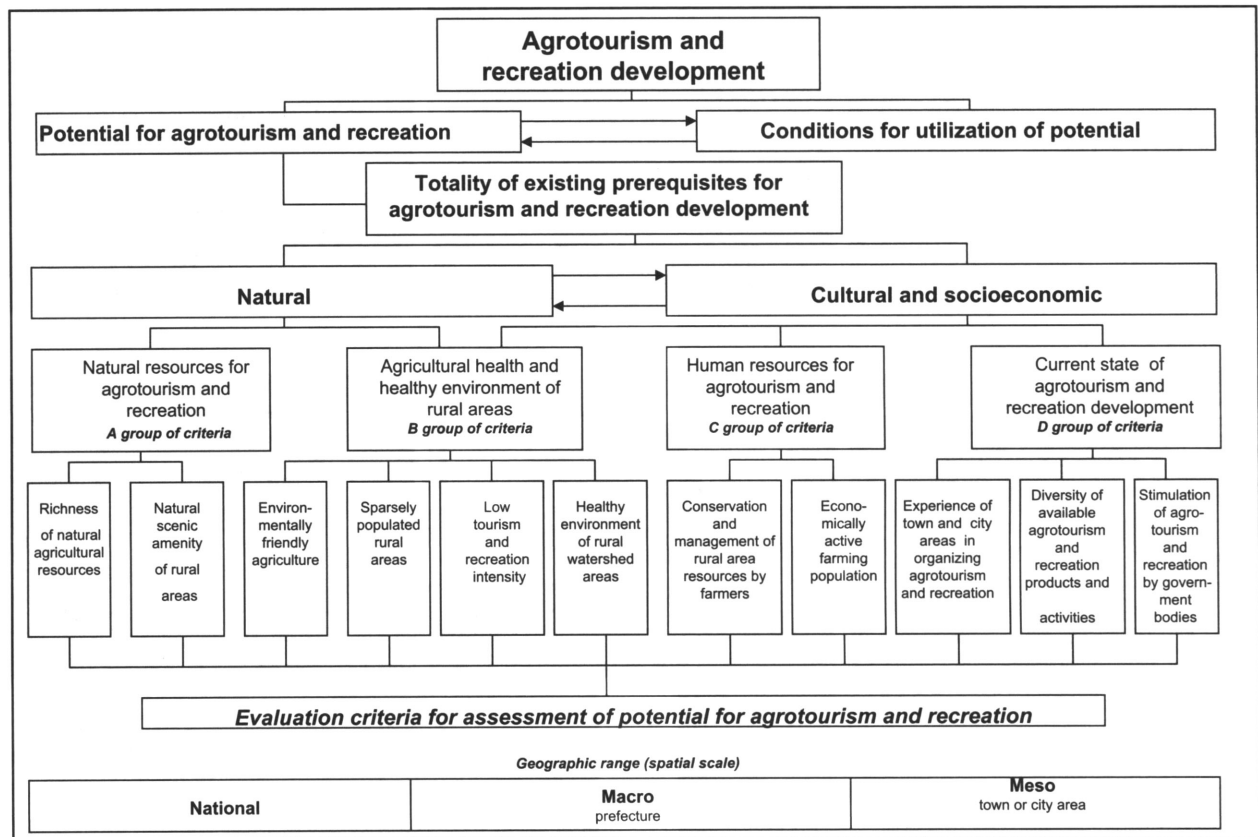


Figure 7. Framework for elaboration of criteria for assessment of agrotourism and recreation potential of town and city areas in Shiga Prefecture, Japan, in light of the watershed sustainability paradigm

between them. The choice of six grades was based on Sturges's Formula:

$$1 + 3.3 \log_{10} n = \text{number of grades}$$

where  $n$  is the number of samples (in our case, 50 city and town areas).

The interval between grades was measured by the formula:

$$\frac{P_{max} - P_{min}}{N}$$

where

$P_{max}$  = the maximum parameter level,  $P_{min}$  = the minimum parameter level, and  $N$  = number of grades (six in our case).

- Qualitative assessment (in grades) of the total potential for agrotourism and recreation in the city and town areas was performed by summing the qualitative assessments of potential for each agrotourism and recreation criteria group. For this purpose we (1) converted the grades of agrotourism and recreation criteria groups into standard units (maximum 6, very high 5, high 4,

medium 3, low 2, very low 1); (2) calculated the total potential for agrotourism and recreation as the sum of the potentials for all criteria groups, in standard units; and (3) graded the city and town areas according to their potential for agrotourism and recreation, in standard units.

- We created a matrix table containing the town and city areas in rows and the qualitative assessments (in grades) of the potential of each criteria group and the total potential for agrotourism and recreation in columns. On the basis of the matrix table a Map 6 "Potential for agrotourism and recreation in city and town areas of Shiga Prefecture, Japan" was created.

#### Materials

Our determination of the characteristics of town or city areas that were important prerequisites for agrotourism and recreation organization, as well as our choice of the criteria for assessing the agrotourism and recreation potential of the town and

city areas of Shiga Prefecture, were based on:

- Experience in elaboration of criteria for assessment of tourism and recreation potential in rayons (town or city areas in Russia) in the Lake Baikal region [16], as well as the results of elaboration of criteria and indicators for sustainable nature management [5, 22].
- Research results presented in papers on agro- and rural tourism and the interface between tourism and agriculture [1-4, 7, 8, 10, 11, 13, 14, 33].
- Field trips to settlements already involved in agrotourism and recreation in Shiga Prefecture: the city of Hikone in the Inae district (May 15; June 19), the village of Hata in the city of Takashima (July 19; September 17), and the towns of Makino (July 21-22), Ryuoh (July 29), and Hino (July 29).
- Results of interviews at the Department of Commerce, Industry, Tourism and Labor, Shiga Prefectural Government (June 20); Department of Agriculture and Fisheries Shiga Prefectural Government (June 20); Agricultural Administration Division, Hikone City Administration (June 19); Tourism Division, Hikone City Administration (June 19); branch office of Takashima City Administration (July 19); and Agriculture Division, Takashima City Administration (August 2). Interviews with farmers involved in agrotourism and recreation at the Hata settlement and in the Inae district of Hikone, as well as with agro-vacationers in the village of Hata and in the towns of Makino, Ryuoh, and Hino, were important sources of information.
- Discussions with members of the research project "Multidisciplinary research for understanding the interaction between humans and nature in the Lake Biwa - Yodo River watershed" (May-August 2006).

Calculation of indicators A1, A2, A3, C1, C2 was based on official statistical data from the Census of Agriculture and Forestry 2000 [19]; indicator C3 was from the Population Census 1960-2000 [31]; indicator B2 from Shiga Prefectural Government Statistical Data of 2003 [25]; indicator B3 was from Statistics on Tourists and Visitors in Shiga

Prefecture in 2004 [32]; indicator B1 was from data from the Shiga Prefecture Environmentally Friendly Agricultural Agreement 2004 [27]; and indicators D1, D2 (related to the current status of agrotourism and recreation) were derived from 2005 data presented in a guide book for tourists and visitors [28] and from data available on internet sites in June-September 2006 [36-82].

## 2.5 Elaboration of criteria and indicators for assessment of agrotourism and recreation potential in town and city areas of Shiga Prefecture, Japan

The framework for elaboration of criteria for assessment of agrotourism and recreation potential in the towns and cities of our study area is presented in Figure 7. To develop agrotourism and recreation, town and city areas had to satisfy 11 selected criteria, which could be grouped into four criteria groups. We considered these four groups to have equal weight in the total assessment of potential for agrotourism and recreation (Table 2).

(A group of criteria) Natural resources for agrotourism and recreation

### 1) Criterion statement

#### *Richness of natural agricultural resources*

Town and city areas have to possess natural resources that can be used as the basis for a variety of agricultural activities during leisure time; from these resources the products of agricultural operations can be derived and further combined with the tourism and recreation experience. The town or city in the study area has to possess agricultural lands, including rice fields, vegetable fields, and fruit gardens, that act as the most important and significant natural resources for agricultural activities and, consequently, for agrotourism.

#### Indicator<sub>A1</sub>

#### *Proportion of agricultural land in the town or city area*

We chose the indicator "proportion of agricultural land in the town or city area" for the above-mentioned criterion statement. The amount of agricultural land as a proportion of the total area of Shiga



Prefecture is slightly more than 10%. A higher proportion of agricultural land in an area suggests that the city or town has higher potential for involvement in agrotourism and recreation.

## 2) Criterion statement

### *Natural scenic amenity of rural areas*

Enjoyment of natural scenic amenity is becoming an increasingly important activity in agrotourism and recreation, as well as in other kinds of rural tourism and recreation. Greater numbers of scenic areas may attract more tourists and visitors to enjoy agricultural activities and the products of agricultural operations.

Among the many results of research done by scientists on the scenic amenity of rural areas [7, 12, 15], we considered the following results particular-

ly important. (1) Climate, topographic variation, and aquatic areas are measures of natural amenity; and (2) areas with scenic amenity are those that contain accessible natural features in a relatively undisturbed condition. To find appropriate indicators, we considered such specific features of our study areas as (1) similar climatic conditions in town and city areas; and (2) rice fields, which are sites of major scenic amenity for agrotourists and visitors, since they form a pleasant rural landscape and symbolize the preserved cultural heritage of the Japanese people.

We found that a total of two indicators met this criterion statement: (1) the proportion of forests, mountains, and aquatic and agricultural areas in the town or city; and (2) the level of topographic

Table 2. Criteria and indicators for assessing agrotourism and recreation potential in town and city areas of Shiga Prefecture, Japan, in light of the watershed sustainability paradigm

Group of criteria	Criterion statement	Indicator (measurement)
<b>A. Natural resources for agrotourism and recreation</b>	Richness of natural agricultural resources	A <sub>1</sub> Proportion of agricultural land in the town or city area (%)
	Natural scenic amenity of rural areas	A <sub>2</sub> Combined proportion of forests, mountains, and aquatic and agricultural areas in the town or city area (%)
		A <sub>3</sub> Level of topographic variation of rice fields
<b>B. Agricultural health and healthy environment of rural areas</b>	Environmentally friendly agriculture	B <sub>1</sub> Proportion of environmentally friendly farmland in the total area of farmland (%)
	Sparsely populated rural areas	B <sub>2</sub> Population density (persons per sq. km)
	Low tourism and recreation intensity	B <sub>3</sub> Tourism and recreation intensity (number of tourists and visitors per sq. km of land area)
	Healthy environment of rural watershed areas	B <sub>4</sub> Water quality*
<b>C. Human resources for agrotourism and recreation</b>	Conservation and management of rural resources by farmers	c <sub>1</sub> Proportion of farm householders in the total number of householders (%)
	Economically active farming population	c <sub>2</sub> Proportion of farmers younger than 65 years in the total number of farmers (%)
		c <sub>3</sub> Rate of increase in the proportion of the population aged 65 years and older, 1990-2000 (%)
<b>D. Current state of agrotourism and recreation development</b>	Experience of town and city areas in organizing agrotourism and recreation	D <sub>1</sub> Proportion of agricultural settlements already involved in agrotourism and recreation in the total number of agricultural settlements (%)
	Diversity of available agrotourism and recreation products and activities	D <sub>2</sub> Number of types (diversity) of agrotourism and recreation units
	Stimulation of agrotourism and recreation by government bodies	D <sub>3</sub> Existence of government-supported projects related to agrotourism and recreation*

\* Indicators were not available for each city town area.



variation in rice fields.

Indicator<sub>A2</sub>

*Combined proportion of forests, mountains, and aquatic and agricultural areas in the town or city area*

Since (1) agrotourists and visitors are those who enjoy the amenity of agricultural rural areas, and (2) natural scenic amenity in a relative undisturbed condition in our study areas could be found only in aquatic, forests and mountainous areas, we chose the "combined proportion of forests, mountains, and aquatic and agricultural areas in the town or city area" as an indicator that met the "natural scenic amenity of rural areas" criteria. A greater proportion of forests, mountains, and aquatic and agricultural areas in the total area of the town or city means that agrotourists and vacationers will find a greater degree of natural scenic amenity.

Indicator<sub>A3</sub>

*Level of topographic variation of rice fields*

Since (1) topographic variation is one of the most important measurements of natural amenity, (2) to the Japanese people, rice fields form a pleasant rural landscape and symbolize a preserved cultural heritage, and (3) Japanese people's preferences towards the scenic topographic features of rice fields differ, we chose the "level of topographic variation of rice fields" as an indicator that met the "natural scenic amenity of rural areas" criteria. We consider that a greater topographic variation in the rice fields in a city or town area may satisfy the preferences of more agrotourists and visitors.

(B group of criteria) Agricultural health and healthy environment of rural areas

1) Criterion statement

*Environmentally friendly agriculture*

A variety of environmentally friendly agricultural activities may occur as part of the leisure experience, and the products of environmentally friendly agricultural operations may be derived and further combined with the tourism and recreation experience in town or city areas if local farmers practice environmentally friendly agriculture. Town or city areas without environmentally friendly agricultural

fields cannot succeed in using agrotourism and recreation to contribute to the health of the rural environment.

Indicator<sub>B1</sub>

*Proportion of environmentally friendly farmland in the total area of farmland*

The area of environmentally friendly farmland as a proportion of the total area of farmland is an indicator of the level of environmentally friendly agricultural activities in the town or city area. A greater proportion of environmentally friendly farmland suggests that the town or city has greater potential for environmentally friendly agrotourism and recreation that can contribute to the health of the rural watershed environment.

2) Criterion statement

*Sparsely populated rural areas*

Sparsely populated and thinly settled rural areas are potentially very attractive destinations for agrotourism and recreation. Their appeal is related to their peace and quiet, as well as to their relatively undisturbed natural, cultural, and agricultural features. Also, a healthier natural environment can be found in sparsely populated countryside. More densely populated rural areas are less attractive for agrotourists and visitors because they are less conducive to the enjoyment of both agricultural activities in a healthy rural environment and the peace and quiet that comes with remote rural areas.

Indicator<sub>B2</sub>

*Population density*

We considered "population density" to be an adequate indicator for evaluation of the "sparsely populated rural areas" criterion. The lower the population density in the city or town, the more likely it is that sparsely populated remote rural areas suitable for agricultural activities combined with the tourism and recreation experience will be found. Less densely populated areas can potentially satisfy the requirements of agrotourists and visitors for a healthy rural environment and can thus attract more vacationers.

3) Criterion statement

*Low tourism and recreation intensity*

Agrotourists and visitors are seeking destinations that are alternatives to overcrowded places of

mass tourism. City and town areas with lower tourism and recreation intensities are more suitable for alternative forms of tourism such as agrotourism and recreation in healthy rural environments.

Indicator<sub>B3</sub>

*Tourism and recreation intensity*

We considered the "tourism and recreation intensity" indicator to be an appropriate indicator that met the above-mentioned criterion statement. We calculated the tourism and recreation intensity of city and town areas as the number of tourists and visitors per sq. km of land area. A lower tourism and recreation intensity is more likely to successfully attract tourists and visitors to enjoy alternative forms of tourism and recreation such as agrotourism and recreation.

4) Criterion statement

*Healthy environment<sup>2)</sup> of rural watershed areas*

A healthy environment brings rural tourism and is a basic need for sustainable agriculture. Because the study area is in a watershed, a healthy environment is critical to environmentally friendly agriculture and consequently to high quality agrotourism and recreation products. Where adverse affects (such as water quality degradation or air pollution) occur, environmentally friendly agriculture and the amenity of the rural environment can be affected. A healthy environment in the rural watershed can encourage an increase in agrotourism and recreation opportunities and generate high-level recreational benefits.

Indicator<sub>B4</sub>

*Water quality*

It was very difficult for us to find appropriate indicators that met this criteria statement, because of (1) the lack of data for each city and town in regard to water, air, and soil quality; and (2) the lack of studies on the levels of water, air, and soil quality that do not threaten human health, and the difficulties in measuring these qualities. Nevertheless, we found that there were no considerable sources of air and soil pollution in our study area, although the problem of water quality did exist. Consequently, we chose surface and drinking water quality as appropriate indicators of the

environmental health of rural watershed areas. Clean surface and drinking waters are environmental benefits of towns and cities that can increase agrotourism and recreation opportunities.

(C group of criteria) Human resources for agrotourism and recreation

1) Criterion statement

*Conservation and management of rural area resources by farmers*

Farmers are major agricultural producers as well as conservationists and managers of the rural resources in our study area. With the decline in the number of farming households, farmers are bearing the increasing burden of conserving and managing farmlands and other important rural resources. Without conservation and management, agricultural and other rural resources would become unattractive for agrotourists and visitors.

Indicator<sub>C1</sub>

*Proportion of farm householders in the total number of householders*

The number of farm householders as a proportion of the total number of householders is an indicator of the capacity for current and future conservation and management of rural resources by farmers. A low proportion of farm householders in a town or city area will mean that the householders in the area will experience difficulties maintaining rural resources. A greater proportion of farm householders means that there will be more human resources for conserving and managing rural resources, and this is likely to make the area attractive to agrotourists and visitors.

2) Criterion statement

*Economically active farming population*

Aging of the farming population will contribute to further abandonment of farmland. The lower the proportion of economically active farmers in an area, the lesser the chance of reversing agricultural decline and switching from farming to service activities like agro tourism and recreation.

Indicator<sub>C2</sub>

*Proportion of farmers younger than 65 years in the total number of farmers*

Indicator<sub>C3</sub>

*Rate of increase in the proportion of the population aged 65 years and older, 1990-2000 (%)*

We considered that a total of two indicators met the "economically active farming population" criterion requirements. These were: the "proportion of farmers younger than 65 years" and the "rate of increase in the proportion of the population aged 65 years and older". We chose the "rate of increase in the proportion of the population aged over 65 years" as an indicator for three main reasons: (1) we could not calculate the rate of increase in the proportion of farmers aged over 65 years, since the data for 1990 and 2000 were not comparable; (2) the tendency in aging of the farm population was similar to that of the total population in our study area; and (3) a high rate of aging of rural populations is one of the main problems limiting many kinds of economic activities, including agrotourism, all over the world, including in our study area.

The greater the proportion of farmers younger than 65 years and the lower the rate of increase in the proportion of the population aged 65 years and older, the higher the possibility of the town or city area implementing agrotourism and recreation projects and the higher the likelihood of young and middle-aged dynamic and innovative farmers organizing tourism and recreation services.

(D group of criteria) Current state of agrotourism and recreation development

## 1) Criterion statement

*Experience of town and city areas in organizing agrotourism and recreation<sup>3)</sup>*

If the town or city has already been involved in organizing agrotourism and recreation it will obviously have more experience in these activities. A greater level of practical experience in organizing agrotourism and recreation means that there will be more socioeconomic prerequisites and incentives for the development of future prosperous agrotourism and recreation.

Indicator<sub>D1</sub>

*Proportion of agricultural settlements already involved in agrotourism and recreation in the total number of agricultural settlements*

We chose the "proportion of agricultural settlements already involved in agrotourism and recreation" as an appropriate indicator for our comparative analyses of town and city areas' experience in agrotourism and recreation organization. If a greater proportion of the agricultural settlements in an area are already involved in agrotourism, then more people in the area will have the skills and knowledge to achieve success in organizing agrotourism and recreation and attracting tourists and visitors.

## 2) Criterion statement

*Diversity of available agrotourism and recreation products and activities*

To develop agrotourism and recreation successfully, diversification of agrotourism and recreation products and activities is needed. Tourists and visitors look forward to a diverse range of tourism and recreation offerings that satisfy a whole spectrum of interests. Diversity in agrotourism and recreation leads to growth in the number of vacationers.

Indicator<sub>D2</sub>

*Number of types (diversity) of agrotourism and recreation units*

We found it difficult to measure the diversity of available agrotourism and recreation products and activities in the towns and cities in our study area. However, it seems to us that the number of types of agrotourism and recreation units in each city or town reflects the current status of diversity of agrotourism and recreation products and activities. Areas with more types of agrotourism and recreation units can offer more diversified products, satisfy more interests, and, therefore, attract more tourists and visitors.

## 3) Criterion statement

*Stimulation of agrotourism and recreation by government bodies*

World experience in agrotourism tells us that agrotourism usually starts if government support exists. Almost all existing projects related to agrotourism in Shiga have been supported by the Japanese Government. Without the stimulation of agrotourism and recreation by government bodies it is very difficult for farmers to switch from producing raw materials to other activities such as

agrotourism.

Indicator<sub>D3</sub>

*Existence of government-supported projects related to agrotourism and recreation*

If projects related to agrotourism and recreation and supported by government bodies already exist in a town or city area, then potentially this territory already has, and will continue to have, more financial and other socioeconomic resources for organizing agrotourism and recreation. Without government support, a city or town may have financial, administrative, or other difficulties in organizing successful agrotourism and recreation.

#### 2.6 Qualitative assessment of potential for agrotourism and recreation in city and town areas: preliminary results

We transformed all the evaluative indicators into indices and then calculated the integral indices of the potential for each agrotourism and recreation criteria group in the city and town areas. Qualitative assessments of the potential for agrotourism and recreation criteria groups and the total potential for agrotourism and recreation in city and town areas were done. The research results are presented in Table 3 and Map 6. The potential for agrotourism and recreation in Shiga Prefecture, evaluated in standard units, varied from 6 in Nagahama to 19 in Aito and Chuzu, giving a difference between maximum and minimum of 3.1 times. Maximum, very high, and high potential for agrotourism and recreation were observed in 24 cities and towns, covering a total area of about 42.4% of Shiga Prefecture. These city and town areas (with the exception of Chuzu and Ryuoh) are mainly less densely populated and comparatively far from the big cities, and they have low tourism and recreation intensity and low density of accommodation facilities. Four cities or towns- Aito, Chuzu, Koto, and Kutsuki -had maximum potential for agrotourism. Aito and Chuzu were ranked first. The high rank for Chuzu can be explained by the maximum grading it received in the current state of agrotourism and recreation development criteria group, its very high rating in the human

resources and natural resources for agrotourism criteria groups, and its medium rating in the agricultural health and healthy environment of rural areas criteria group. Although Aito had a low grading in the current state of agrotourism and recreation development criteria group, its maximum total potential was based on its maximum grading in the natural resources and human resources for agrotourism criteria groups and its very high grading in the agricultural health and healthy environment of rural areas criteria group. Our research clarified the suitability of 38 cities and towns (about 64.5% of the total area of Shiga Prefecture) for agrotourism and recreation development, since they possess potentials for agrotourism and recreation ranging from maximum to very high, high, and medium. They may succeed in agrotourism under conditions favorable for the utilization of potential. Their agrotourism and recreation potential may be utilized to meet the demands of not only local residents, but also people from other cities and towns in Shiga or neighboring prefectures.

Thirteen cities and towns, making up about 22.4% of the total area of the prefecture, had low or very low potential for agrotourism and recreation. The agrotourism criteria group gradings of these cities and towns were assessed mainly as medium, low, or very low. These areas are either very densely populated, with favorable locations of transport, high tourism intensity, and high density of accommodation facilities due to mass tourism (e.g. Otsu, Moriyama, Kusatsu, Hikone, or Nagahama) or less densely populated with less favorable locations of transport and weak involvement in either mass tourism or agrotourism and recreation (e.g. Minakuchi, Imazu, or Santo). Under the current conditions it would seem difficult for these areas to attract agrotourists and visitors, although it would be possible to conduct agricultural activities oriented toward the pleasure and experience of the people living in these areas.

The city of Hikone, a meso-level study area in our project, possesses very low potential for agrotourism and recreation compared with other city and town areas. This is mainly because Hikone has

fewer natural and human resources for agrotourism, as well as a very low grading for the current state of development of its agrotourism and recreation. Its proportion of farm householders is only 7.2%, one of the lowest in Shiga Prefecture. Its natural scenic amenity index (about 0.25) and its proportion of agricultural settlements involved in agrotourism and recreation (about 0.01) are both comparatively very low. In the current highly competitive situation between city and town areas, in the near future it is likely to be difficult for Hikone to attract agrotourists and visitors from outside the city area. At the same time, any kinds of agrorecreation activities that meet the demands of local residents may be successfully developed. Although Hikone has a very low potential for agrotourism and recreation compared with other city and town areas, the Inae district, located in the southern part of the city, possesses more natural and human resource prerequisites for agrotourism and recreation. The lack of attractiveness of the landscape, in light of the topography of this area, limits the development of agrotourism and recreation for visitors from outside. However, if it will be developed an agrogarden in the Inae district, mainly for local residents, this would seem to be a very good contribution to the agrorecreation of the people of Hikone. Such an agrogarden will be able to support the sustainability of the local agrocommunity and contribute to the interaction between the rural and urban areas of Hikone, an interaction that is becoming a very important issue.

## 2.7 Conclusion

According to our preliminary study, agrotourism and recreation can be successfully developed in the Lake Biwa region, since more than 60% of the total land area possesses maximum, very high, high, or medium potential for these activities. At the same time, taking into account the world experience of agrotourism as opposed to mass tourism, we can predict that there will be a comparatively small, or moderate, number of agrotourists and visitors, although their numbers will steadily increase. Future utilization of potential for agrotourism and recreation will not increase tourism

and recreation pressure on the environment, since areas of high and very high potential for agrotourism and recreation are located mainly in towns and cities (with the exception of Chuzu, Kohoku, Makino and Ryuoh) that have low tourism and recreation intensities and low densities of accommodation facilities. Even in Chuzu, Kohoku, Makino and Ryuoh, agrotourism will be localized in places that differ from those overcrowded by mass tourism and recreation.

If tourism and recreation develop as the combination of a variety of environmentally friendly agricultural activities for leisure and as the products of environmentally friendly agricultural operations combined with tourism experience, then they may be able to support rural communities towards environmentally friendly agriculture and thus contribute to the improvement of the Lake Biwa - Yodo River watershed environment.

The concept of agrotourism and recreation described here, including the criteria and indicators for the evaluation of agrotourism and recreation potential and the methods of qualitative assessment of potential for agrotourism and recreation can be applied to the spatial study of agrotourism in other regions. Our research results are still preliminary, however, future research towards this direction may be useful to the Shiga Prefectural Government and municipal governmental bodies, as well as to businesspeople and rural communities, in decision-making concerning agrotourism development or related types of tourism such as green or rural. A spatial study of the potential for agrotourism and recreation in Shiga Prefecture may provide a basis for future economic, sociological, and management research in the field of agrotourism.

We hope that this report, with its information and stimulation of discussion, will contribute to the common goal to find a future for tourism and agriculture in the Lake Biwa region that is not only economically viable, but also sustainable in terms of the watershed environment.

## Footnotes

- 1) In this context "unit" means a place in space



where interaction between agrotourists and visitors and the organizers of agrotourism business occurs.

- 2) In this context, "healthy environment" means a healthy human habitat, including clean water, air, and soil that are free from toxins or hazards that threaten human health.
- 3) Town and city area experience comprises the knowledge and skills of people in observing things or events in agrotourism and recreation; these skills and knowledge are gained through involvement in, or exposure to, these things or events.

#### References

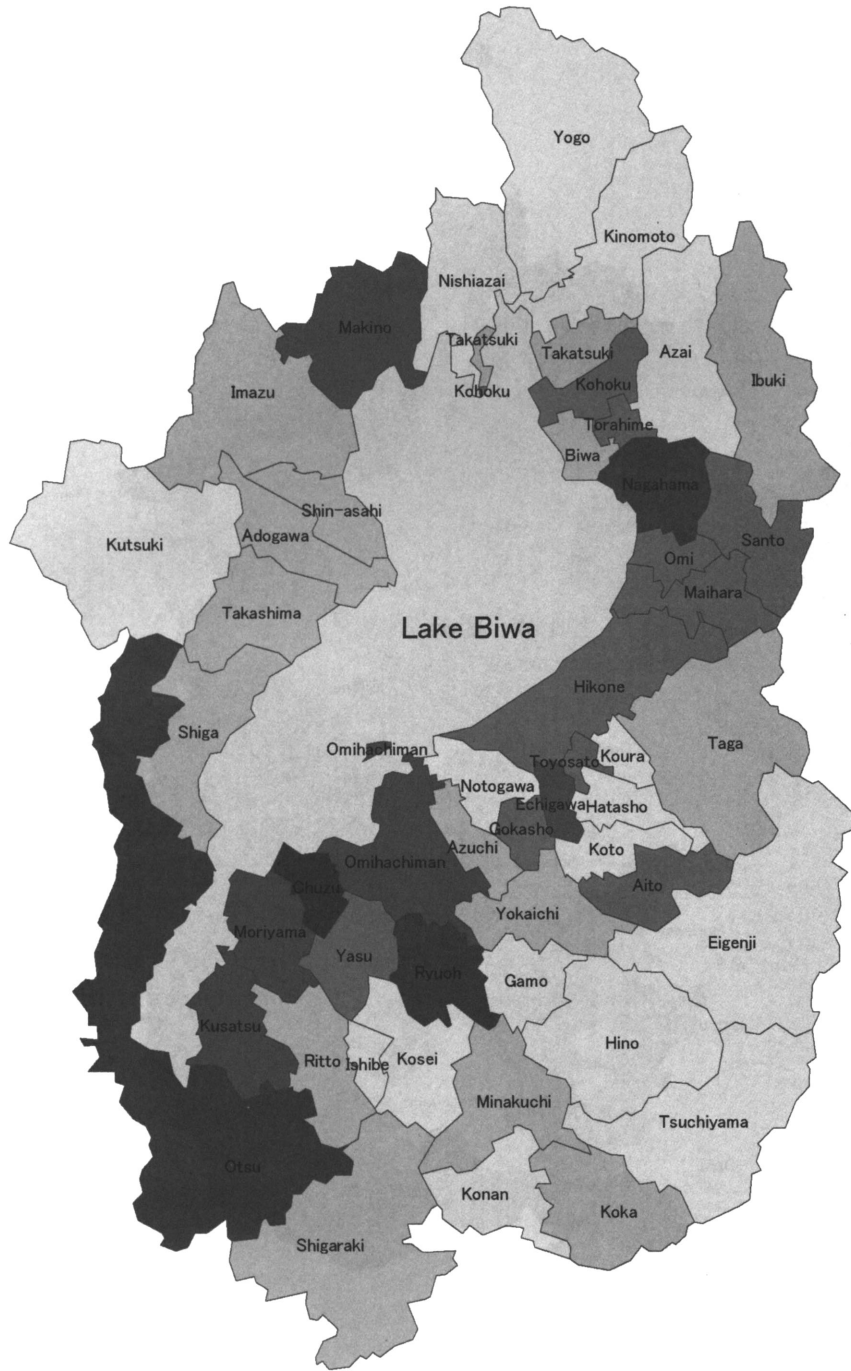
- 1) Williams P., Paridaen M., Dossa K. and Dumais M., *Agritourism Market and Product Development Status Report*. (2001) 104pp. Center for Tourism Policy and Research, Simon Fraser University. Burnaby, BC, Canada.
- 2) The Ministry of Agriculture, Forestry and Fisheries, Japanese Government, *Annual Report on Food, Agriculture and Rural Areas in Japan*. -Part 1. Trends in Food, Agriculture and Rural Areas, summary (provisional translation)- (2004) 63 pp.
- 3) Arahi Y., *Rural tourism in Japan: the regeneration of rural communities*. Food and Fertilizer Technology Center. (1998) Available at <http://www.agnet.org/library/>.
- 4) Augustyn M., *National Strategies for Rural Tourism Development and Sustainability: The Polish Experience*. *Journal of Sustainable Tourism*. Vol. 6 (1998) 3:191-209.
- 5) Bell S. and Morse S., *Sustainability Indicators: Measuring the Immeasurable*. (2000) Earthscan Publications Ltd, London and Sterling, VA.
- 6) German Federal Agency for Nature Conservation [Ed.], *Biodiversity and Tourism: Conflicts on the World's Seacoasts and Strategies for Their Solution* (1997) Springer.
- 7) Bowen R.L., Cox L.J. and Fox M., *The interface between tourism and agriculture*. *The Journal of Tourism Studies*, 2(2) (1991) 43-54.
- 8) Connolly L. and Heneghan M., *Rural Tourism Survey*. *Farm & Food*. 8(4) (1998) 7-9.
- 9) Biwako visitors Bureau Publications, *Convenient data for tourists*. Shiga Prefecture Sightseeing Guide Book. (2005) (in Japanese). 滋賀県商業観光振興課『滋賀観光ベストガイド』
- 10) Fawcett S.L., *Quality in the agri-tourism product*. *Progress in Tourism and Hospitality Research*. 2(1) (1996) 79-86.
- 11) Fleischer A. and Pizam A., *Rural tourism in Israel*. *Tourism Management*. Vol. 18 (1997) 6: 367-372.
- 12) Hernandez J., Garcia L., Moran J., Juan A. and Ayuga F., *Estimating visual perception of rural landscapes: the influence of vegetation. The case of Esla Valley (Spain)*. *Food, Agriculture and Environment*. Vol. 1 (2003) 1: 139-141.
- 13) Telfer D. J., *Agritourism - a path to community development?: the case of Bangunkerto, Indonesia*. *Tourism and Sustainable Community Development*. (2002) 242-257.
- 14) Kappert J., *Community and rural development in Northern Portugal*. *Tourism and Sustainable Community Development*. (2002) 258-267.
- 15) McDaniel K., *Can scenic amenities offer rural gain without pain? The Main Street Economist*. Center for the Study of Rural America. (2000) Available at <http://www.kc.frb.org/>
- 16) Khantashkeeva T.V., *Recreational potentialities of the Republic of Buryatia and perspectives of its utilization*. Thesis for a Candidatskaya degree in geography. Irkutsk. (1996) 132 pp. (in Russian).
- 17) Khantachkeeva T.V., *Tourism and recreation in the Republic of Buryatia (Russian Federation): present condition and approaches to sustainable development*. *Ecofrontier*. 5, (2000) 34-40 (in Japanese). 『ロシア連邦ブリヤート共和国のツーリズムとレクリエーション』(日本語タイトル)
- 18) Kotlarov E.A., *Geography of Tourism and Recreation*. Moscow. (1978) 238pp. (In Russian).
- 19) Ministry of Agriculture, Forestry and



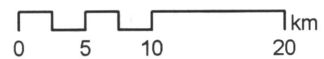
- Fisheries of Japan. World Census of Agriculture and Forestry 2000. (2002) (in Japanese) 農林水産省『世界農業センサス』(2002) Available at <http://www.maff.go.jp/census/2000/index.html>
- 20) Mukhina L.I. & Savelyeva V.V. Particularities of recreational assessment of upland territory (case study in Arkhyz). *Izvestia Academy of Sciences of the USSR. Geography.* 1 (1973) 95-102. (in Russian).
- 21) Nefedova V.B., Smirnova E.D. & Shvidchenko L.G. Methods of recreational assessment of territory. *Bulletin of Moscow State University. Geography.* 5. (1973) (in Russian).
- 22) Report of International Conference on the Contribution of Criteria and Indicators for Sustainable Forest Management: The Way Forward (CICI-2003), 3-7 February (2003) Guatemala City, Guatemala. Available at <http://www.fao.org/DOCREP/>.
- 23) Pirozhnik I.I., *The Basis of Geography of Tourism.* Minsk. (1985) 253 pp. (In Russian).
- 24) Shiga Prefecture, *Shiga Prefecture Government Statistical Book 2000.* (2001) (in Japanese).  
滋賀県政策調整部統計課『平成12年滋賀県統計書』(2001) Available at <http://www.pref.shiga.jp/data/statistical-book/2000/>
- 25) Shiga Prefecture, *Shiga Prefecture Government Statistical Book 2003* (2004) (in Japanese).  
滋賀県統計課『平成15年 滋賀県統計書』(2004) Available at <http://www.pref.shiga.jp/data/statistical-book/2003/>.
- 26) Shiga Prefecture, *Shiga Prefecture Government Statistical Book 2000* (2001) (in Japanese).  
滋賀県政策調整部統計課『平成12年滋賀県統計』(2001) Available at <http://www.pref.shiga.jp/data/statistical-book/2000/>.
- 27) Shiga Prefecture, *Environmentally Friendly Agricultural Agreement 2004* (2005) (in Japanese).  
滋賀県『環境こだわり農業実施協定締結者等一覧表』(2005) Available at <http://www.pref.shiga.jp/g/kodawari/list/zentai.pdf>.
- 28) Shiga Prefecture, *Lake Biwa Guide Book* (2006) JTB Publishing Inc., Tokyo, 147 pp. (in Japanese).  
JTBパブリッシング『るるぶ 滋賀・びわ湖・若狭 '06~'07』(2006)
- 29) Shiga Prefecture, *Shiga Prefecture Tourism Promotion Policy* (2001) Shiga Prefecture Publishing, Otsu, 59 pp. (in Japanese).  
滋賀県『滋賀県観光振興指針 湖国観光交流ビジョン』(2001)
- 30) Shinjo A., *Introduction to Bio-statistics.* (1996) Asakura-shoten. Tokyo (in Japanese).  
新城 明久『新版 生物統計入門』朝倉書店 (1996)
- 31) *Statistic Bureau of Ministry of Internal Affairs and Communication, Population Census 1960\_2000.* (2001) (in Japanese).  
総務省統計局『国勢調査 昭和35年~平成12年』(2001) Available at <http://www.pref.shiga.jp/data/population/renew/nenpo/koku6.xls>.
- 32) Shiga Prefecture, *Statistics of Tourists and Visitors in Shiga Prefecture in 2004.* (2005) Shiga Prefectural Government, Department of Promotion for Commerce and Tourism. (in Japanese).  
滋賀県商工観光労働部商業観光振興課『平成16年滋賀県観光入込客統計調査書』
- 33) Anthopoulou T., *Agrotourism and the rural environment: constraints and opportunities in the Mediterranean less-favoured areas. Tourism and Environment: Regional, Economic, Cultural and Policy Issues.* (2000) 357-373. Kluwer Academic Publishers.
- 34) *World's Top Tourism Destinations by data collected by World Tourism Organization (1995-2004).* Available at [www.world-tourism.org](http://www.world-tourism.org)
- Data available from internet web sites:
- 35) <http://www.jtb.co.jp>
- 36) <http://www.biwako-visitors.jp/>
- 37) <http://www.lookpage.co.jp/>
- 38) <http://www.biwa.ne.jp/>
- 39) <http://www.pref.shiga.jp/>
- 40) <http://www.lakeootu.jas.or.jp/>
- 41) <http://www.city.otsu.shiga.jp/>

- 42) <http://www.rockbaygarden.com/>
- 43) <http://www.karasuma.co.jp/>
- 44) <http://www.city.moriyama.shiga.jp>
- 45) <http://www.ohmifuji.jas.or.jp/>
- 46) <http://www.sunshine-v.com/>
- 47) <http://ritto-konze-no-sato.or.jp/>
- 48) <http://www.agurinosato.com/>
- 49) <http://www.ritto.jas.or.jp/>
- 50) <http://www.ocn.ne.jp/~farm/>
- 51) <http://travel.nifty.com/>
- 52) <http://www.ja-koukagun.jp/>
- 53) <http://www.michieki.jp/>
- 54) <http://www.inakataiken.com/>
- 55) <http://www.koka-kanko.org/>
- 56) <http://www.koka-ninja.com>
- 57) <http://www.e-omi.jp/>
- 58) <http://www.bcap.co.jp/>
- 59) <http://homepage1.nifty.com/>
- 60) <http://www.aito-ms.or.jp/>
- 61) <http://www.kosuginoen.com/>
- 62) <http://www.jakoto.jas.or.jp/>
- 63) <http://www.blumenooka.jp/>
- 64) <http://www.h6.dion.ne.jp/>
- 65) <http://www.rmc.ne.jp/>
- 66) <http://www.za.ztv.ne.jp/>
- 67) <http://www.jaeast.com/>
- 68) <http://www.shunsainomori.com/>
- 69) <http://www.lakeibuki.jas.or.jp/>
- 70) <http://www.ibukisoba.co.jp/>
- 71) <http://www.city.maibara.shiga.jp/>
- 72) <http://www.goichi.jp/>
- 73) <http://www.omihahanosato.jp/>
- 74) <http://www.home.cs.puon.net/>
- 75) <http://www.kitaomi.com/>
- 76) <http://www.kkr.mlit.go.jp/>
- 77) <http://www.koti.jp/>
- 78) <http://www.ex.biwa.ne.jp/>
- 79) <http://www.kutsuki.or.jp/leisure/>
- 80) <http://www.cowcowfarm.com/>
- 81) <http://www.city.takashima.shiga.jp/>
- 82) <http://www18.ocn.ne.jp/>

## Tourism and recreation pressure on environment in city and town areas of Shiga Prefecture, Japan

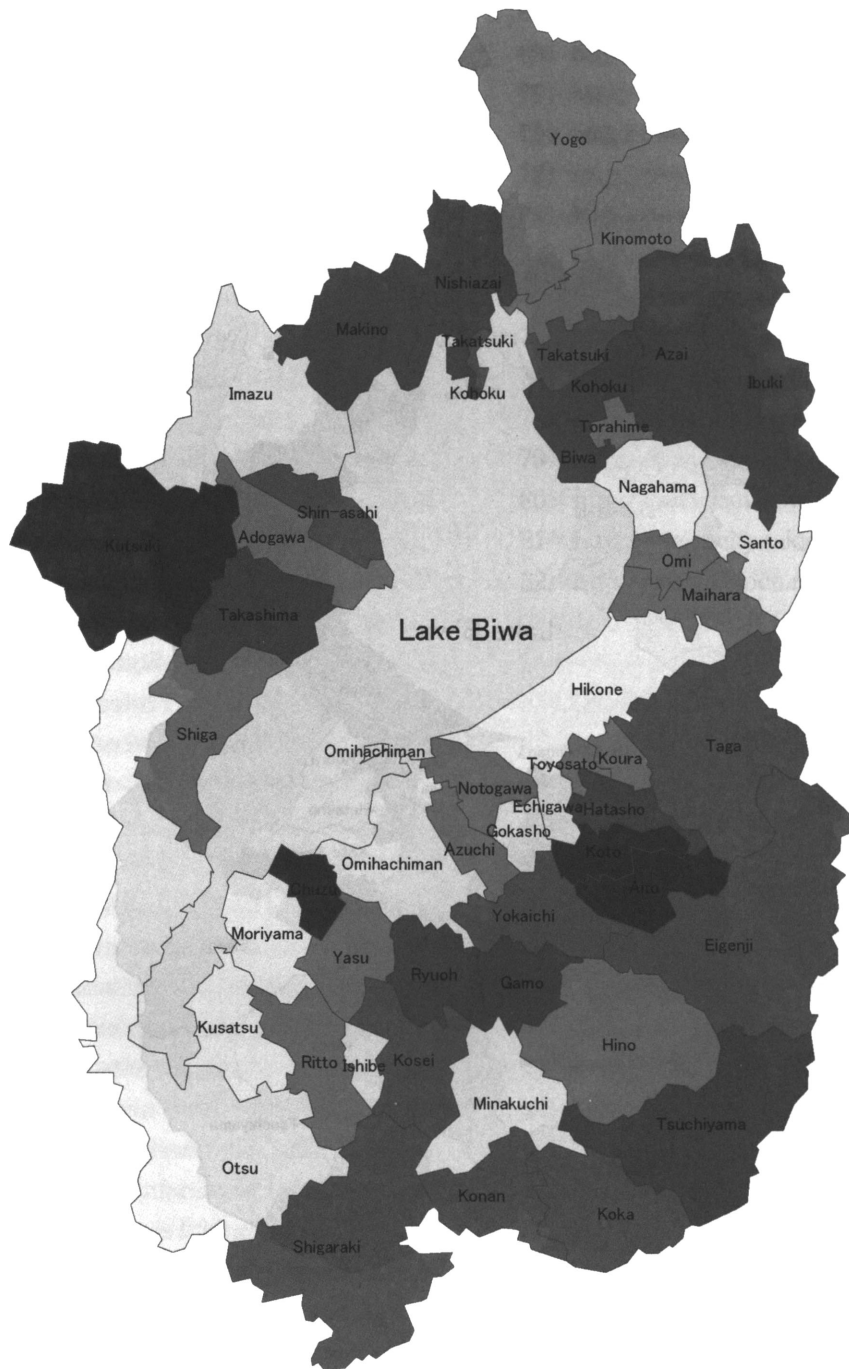


Legend	Grade	Tourism and recreation pressure on environment in standard units
	Very low	3-4
	Low	5-6
	Medium	7-8
	High	9-10
	Very high	11-12
	Maximum	13 and more

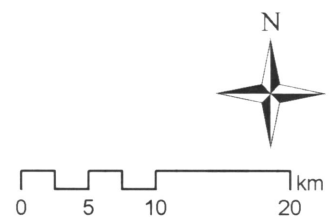


Map 5.

## Potential for agrotourism and recreation in city and town areas of Shiga Prefecture, Japan



Legend	Grade	Potential for agrotourism and recreation in standard units
	Very low	less than 9
	Low	10 - 11
	Medium	12 - 13
	High	14 - 15
	Very high	16 - 17
	Maximum	18 - 19



Map 6.

Table 1. Quantitative and qualitative assessment of indicators related to tourism and recreation pressure on environment in town and cities areas of Shiga Prefecture, Japan

Name of city or town (2004)		Area (sq. km)	Tourism and recreation intensity* (2004)			Density of accommodation facilities** (2004)			Rate of increase in number of tourists and visitors from 1994 to 2004 (%)			Tourism and recreation pressure on environment****	
Japanese	English		Quantitative assessment	Grade	Grade in standard units	Quantitative assessment	Grade	Grade in standard units	Quantitative assessment	Grade	Grade in standard units	Grade	Grade in standard units
中主町	Chuzu	21	35376.1	maximum	6	113.8	maximum	6	658.8	high increase	4	maximum	16
長浜市	Nagahama	46	106802.1	maximum	6	43.9	high	4	59.8	low increase	2	very high	12
竜王町	Ryuoh	44	33977.2	maximum	6	26.0	medium	3	317.4	medium increase	3	very high	12
大津市	Otsu	302	31807.6	maximum	6	35.8	high	4	-28.1	decrease	1	very high	11
マキノ町	Makino	78	10511.5	low	2	67.1	maximum	6	51.1	low increase	2	high	10
草津市	Kusatsu	48	33689.5	maximum	6	11.3	low	2	134.5	low increase	2	high	10
守山市	Moriyama	45	20231.1	high	4	32.2	medium	3	13.8	low increase	2	high	9
愛知川町	Echigawa	13	7584.6	low	2	0.0***	very low	1	2304.8	maximum increase	6	high	9
近江八幡市	Omiachiman	76	29546.0	very high	5	17.7	low	2	79.0	low increase	2	high	9
虎姫町	Torahime	97	276.2	very low	1	0.3	very low	1	1388.8	maximum increase	6	medium	8
五箇荘町	Gokasho	16	23356.2	high	4	0.0***	very low	1	269.6	medium increase	3	medium	8
豊郷町	Toyosato	77	553.2	very low	1	0.0***	very low	1	1538.4	maximum increase	6	medium	8
山東町	Santo	54	6451.8	low	2	22.5	medium	3	364.5	medium increase	3	medium	8
湖北町	Kohoku	28	19053.5	high	4	2.8	very low	1	383.2	medium increase	3	medium	8
愛東町	Aito	41	13375.6	medium	3	0.0***	very low	1	538.4	high increase	4	medium	8
野洲町	Yasu	40	25230.0	very high	5	1.1	very low	1	105.4	low increase	2	medium	8
米原町	Maihara	43	14983.7	medium	3	0.0***	very low	1	330.3	medium increase	3	medium	7
彦根市	Hikone	98	27571.4	very high	5	9.8	very low	1	-12.9	decrease	1	medium	7
近江町	Omi	18	14050.0	medium	3	0.0***	very low	1	289.1	medium increase	3	medium	7
高島町	Takashima	63	7019.0	low	2	19.1	low	2	25.9	low increase	2	low	6
びわ町	Biwa	17	17152.9	medium	3	0.0***	very low	1	11.1	low increase	2	low	6
志賀町	Shiga	72	19954.1	high	4	4.5	very low	1	-41.4	decrease	1	low	6
多賀町	Taga	136	13836.0	medium	3	1.7	very low	1	12.1	low increase	2	low	6
安土町	Azuchi	24	23516.6	high	4	0.0***	very low	1	-25.7	decrease	1	low	6
安曇川町	Adogawa	48	3989.5	very low	1	36.8	high	4	-31.2	decrease	1	low	6
水口町	Minakuchi	69	7021.7	low	2	2.3	very low	1	14.6	low increase	2	low	5
信楽町	Shigaraki	164	9921.9	low	2	0.5	very low	1	22.9	low increase	2	low	5
八日市市	Yokaichi	52	11702.0	low	2	2.5	very low	1	13.0	low increase	2	low	5
栗東市	Ritto	53	9271.6	low	2	10.2	very low	1	79.0	low increase	2	low	5
新旭町	Shin-asahi	33	8751.5	low	2	18.1	low	2	-23.4	decrease	1	low	5
伊吹町	Ibuki	109	7654.1	low	2	7.6	very low	1	79.2	low increase	2	low	5
今津町	Imazu	123	3765.8	very low	1	14.3	low	2	33.3	low increase	2	low	5
高月町	Takatsuki	25	11072.0	low	2	0.0***	very low	1	88.3	low increase	2	low	5
甲賀町	Koka	72	5279.1	very low	1	14.6	low	2	2.5	low increase	2	low	5
土山町	Tsuchiyama	128	4857.0	very low	1	2.0	very low	1	3.7	low increase	2	very low	4
甲西町	Kosei	57	5819.2	very low	1	0.0***	very low	1	102.3	low increase	2	very low	4
永源寺町	Eigenji	182	1980.7	very low	1	0.7	very low	1	32.9	low increase	2	very low	4
湖東町	Koto	27	3681.4	very low	1	8.1	very low	1	26.6	low increase	2	very low	4
能登川町	Notogawa	31	4187.0	very low	1	0.0***	very low	1	46.6	low increase	2	very low	4
甲良町	Koura	13	8515.3	low	2	0.0***	very low	1	-29.6	decrease	1	very low	4
浅井町	Azai	87	3466.6	very low	1	0.0***	very low	1	12.7	low increase	2	very low	4
西浅井町	Nishiazai	67	4079.1	very low	1	4.3	very low	1	0.6	low increase	2	very low	4
日野町	Hino	117	5827.3	very low	1	5.3	very low	1	91.3	low increase	2	very low	4
秦荘町	Hatasho	25	8764.0	low	2	0.0***	very low	1	-0.5	decrease	1	very low	4
木之本町	Kinomoto	88	2589.7	very low	1	4.8	very low	1	3.9	low increase	2	very low	4
朽木村	Kutsuki	166	3933.7	very low	1	3.1	very low	1	86.2	low increase	2	very low	4
余呉町	Yogo	168	1456.5	very low	1	4.7	very low	1	-12.3	decrease	1	very low	3
甲南町	Konan	49	2271.4	very low	1	0.2	very low	1	-4.9	decrease	1	very low	3
石部町	Ishibe	13	3261.5	very low	1	0.0***	very low	1	-45.6	decrease	1	very low	3
蒲生町	Gamo	35	2288.5	very low	1	0.0***	very low	1	-27.7	decrease	1	very low	3

Notes: \* Tourism and recreation intensity was calculated as number of tourists and visitors per sq. km of land area.

\*\* Density of accommodation facilities was calculated as the capacity (maximum occupancy rate) of accommodation facilities per sq. km of land area.

\*\*\* Available source of information does not mention about accommodation facilities in this area.

\*\*\*\* Tourism and recreation "pressure" on environment was calculated as the total of three indicators: "tourism and recreation intensity", "density of accommodation facilities", and "rate of increase in number of tourists and visitors".

Source: [9,32]



Table 3. Qualitative assessment of potential for agrotourism and recreation in town and city areas of Shiga Prefecture, Japan

Name of city or town (2004)*		Area (sq. km)	Potential for agrotourism and recreation criteria groups												Total potential for agrotourism and recreation	
			Natural resources for agrotourism and recreation			Agricultural health and healthy environment of rural areas			Human resources for agrotourism and recreation			Current state of agrotourism and recreation development				
Japanese	English		Index	Grade	Grade in standard units	Index	Grade	Grade in standard units	Index	Grade	Grade in standard units	Index	Grade	Grade in standard units	Grade	Grade in standard units
粟東町	Aito	41	0.65	Maximum	6	0.71	Very high	5	0.71	Maximum	6	0.29	Low	2	Maximum	19
中主町	Chuzu	21	0.61	Very high	5	0.57	Medium	3	0.62	Very high	5	0.88	Maximum	6	Maximum	19
湖東町	Koto	27	0.71	Maximum	6	0.71	Very high	5	0.75	Maximum	6	0.17	Very low	1	Maximum	18
朽木村	Kutsuki	166	0.50	High	4	0.72	Very high	5	0.46	Medium	3	0.70	Maximum	6	Maximum	18
伊吹町	Ibuki	109	0.36	Low	2	0.67	High	4	0.60	Very high	5	0.77	Maximum	6	Very high	17
マキノ町	Makino	78	0.54	High	4	0.69	High	4	0.58	High	4	0.55	Very high	5	Very high	17
西浅井町	Nishiazai	67	0.41	Medium	3	0.75	Very high	5	0.84	Maximum	6	0.37	Medium	3	Very high	17
湖北町	Kohoku	28	0.64	Maximum	6	0.76	Very high	5	0.63	Very high	5	0.16	Very low	1	Very high	17
びわ町	Biwa	17	0.55	High	4	0.80	Maximum	6	0.71	Maximum	6	0.17	Very low	1	Very high	17
竜王町	Ryuoh	44	0.50	High	4	0.67	High	4	0.62	Very high	5	0.43	High	4	Very high	17
秦荘町	Hatasho	25	0.71	Maximum	6	0.65	High	4	0.74	Maximum	6	0.00	Very low	1	Very high	17
高島町	Takashima	63	0.56	Very high	5	0.70	Very high	5	0.55	High	4	0.26	Low	2	Very high	16
浅井町	Azai	87	0.45	Medium	3	0.80	Maximum	6	0.64	Very high	5	0.29	Low	2	Very high	16
土山町	Tsuyama	128	0.52	High	4	0.71	Very high	5	0.44	Medium	3	0.46	High	4	Very high	16
蒲生町	Gamo	35	0.51	High	4	0.70	Very high	5	0.68	Very high	5	0.25	Low	2	Very high	16
甲賀町	Koka	72	0.39	Low	2	0.69	High	4	0.57	High	4	0.52	Very high	5	High	15
永源寺町	Eigenji	182	0.40	Medium	3	0.75	Very high	5	0.69	Very high	5	0.28	Low	2	High	15
新旭町	Shin-asahi	33	0.56	Very high	5	0.66	High	4	0.43	Medium	3	0.39	Medium	3	High	15
信楽町	Shigaraki	164	0.49	High	4	0.69	High	4	0.30	Low	2	0.57	Very high	5	High	15
高月町	Takatsuki	25	0.62	Very high	5	0.68	High	4	0.55	High	4	0.00	Very low	1	High	14
八日市市	Yokaichi	52	0.58	Very high	5	0.61	High	4	0.48	Medium	3	0.28	Low	2	High	14
多賀町	Taga	136	0.51	High	4	0.72	Very high	5	0.52	High	4	0.00	Very low	1	High	14
甲西町	Kosei	57	0.58	Very high	5	0.66	High	4	0.23	Very low	1	0.41	High	4	High	14
甲南町	Konan	49	0.41	Medium	3	0.68	High	4	0.40	Medium	3	0.46	High	4	High	14
安曇川町	Adogawa	48	0.53	High	4	0.68	High	4	0.37	Low	2	0.33	Medium	3	Medium	13
日野町	Hino	117	0.40	Medium	3	0.65	High	4	0.54	High	4	0.28	Low	2	Medium	13
豊郷町	Toyosato	77	0.48	High	4	0.67	High	4	0.50	High	4	0.00	Very low	1	Medium	13
甲良町	Koura	13	0.63	Very high	5	0.59	Medium	3	0.59	High	4	0.00	Very low	1	Medium	13
虎姫町	Torahime	97	0.47	Medium	3	0.92	Maximum	6	0.41	Medium	3	0.00	Very low	1	Medium	13
志賀町	Shiga	72	0.49	High	4	0.58	Medium	3	0.45	Medium	3	0.38	Medium	3	Medium	13
安土町	Azuchi	24	0.56	Very high	5	0.69	High	4	0.47	Medium	3	0.07	Very low	1	Medium	13
栗東市	Ritto	53	0.48	High	4	0.53	Medium	3	0.34	Low	2	0.46	High	4	Medium	13
木之本町	Kinomoto	88	0.53	High	4	0.75	Very high	5	0.43	Medium	3	0.00	Very low	1	Medium	13
余呉町	Yogo	168	0.39	Low	2	0.75	Very high	5	0.57	High	4	0.17	Very low	1	Medium	12
野洲町	Yasu	40	0.42	Medium	3	0.56	Medium	3	0.35	Low	2	0.41	High	4	Medium	12
能登川町	Notogawa	31	0.52	High	4	0.65	High	4	0.42	Medium	3	0.00	Very low	1	Medium	12
米原町	Maihara	43	0.42	Medium	3	0.61	High	4	0.35	Low	2	0.34	Medium	3	Medium	12
近江町	Omi	18	0.49	High	4	0.58	Medium	3	0.53	High	4	0.00	Very low	1	Medium	12
愛知川町	Echigawa	13	0.39	Low	2	0.57	Medium	3	0.53	High	4	0.20	Low	2	Low	11
近江八幡市	Omiachiman	76	0.48	High	4	0.56	Medium	3	0.42	Medium	3	0.00	Very low	1	Low	11
山東町	Santo	54	0.26	Very low	1	0.64	High	4	0.60	Very high	5	0.00	Very low	1	Low	11
今津町	Imazu	123	0.53	High	4	0.71	Very high	5	0.25	Very low	1	0.00	Very low	1	Low	11
石部町	Ishibe	13	0.54	High	4	0.63	High	4	0.16	Very low	1	0.26	Low	2	Low	11
水口町	Minakuchi	69	0.36	Low	2	0.64	High	4	0.40	Medium	3	0.16	Very low	1	Low	10
五箇荘町	Gokasho	16	0.36	Low	2	0.59	Medium	3	0.45	Medium	3	0.21	Low	2	Low	10
大津市	Otsu	302	0.46	Medium	3	0.43	Low	2	0.23	Very low	1	0.46	High	4	Low	10
守山市	Moriyama	45	0.42	Medium	3	0.43	Low	2	0.38	Low	2	0.19	Very low	1	Very low	8
彦根市	Hikone	98	0.36	Low	2	0.54	Medium	3	0.30	Low	2	0.13	Very low	1	Very low	8
草津市	Kusatsu	48	0.39	Low	2	0.30	Very low	1	0.37	Low	2	0.39	Medium	3	Very low	8
長浜市	Nagahama	46	0.39	Low	2	0.22	Very low	1	0.34	Low	2	0.14	Very low	1	Very low	6

\*List of cities and towns compiled by Mr. Takuya Tanaka.  
Source : [19,25,27,28,31,32, 36-82]