Ecotourism and Climate in Yunnan, South China

Masatoshi YOSHINO

Professor Emeritus, University of Tsukuba, Japan
and
Senior Programme Advisor, Sustainable Environmental Development, United Nations University
e-mail: mtoshiyo@poplar.ocn.ne.jp

Abstract
This report first discusses the status of tourism in China as a whole and in Yunnan Province. In particular, it analyzes problems from the standpoint of ecotourism in relation to climatic conditions and year-to-year changes in them. Impacts of climate and weather are dealt with in terms of temperature, wetness/dryness, neve (glaciers and snow) landscapes and fine weather (sunshine or blue sky). Second, it describes numbers of tourists and revenue from tourism in Yunnan. An important point to note is that an abrupt change is clear in the total revenue from tourism for the province, but not in the numbers of international tourists since 1996. After 2004, they have increased with great growth rates. Third, influence of the SARS (Severe Acute Respiratory Syndrome) in 2003 is analyzed. The number of tourists from abroad to China was decreased by 23.3% as compared with the preceding year. It decreased to 25%-60% of normal in May, June and July, but recovered after three months. The reduction in numbers of domestic tourists was particularly noticeable among travels using railway. Degree of impacts of SARS on tourism differed considerably from area to area in South Yunnan.

Key words: ecotourism, SARS, tourism-climate relationship, Yunnan, Xishuangbanna

1. Introduction
Tourism is an industry which has been developing in recent years in China. Customarily, people in China return to their hometowns during the New Year holidays, even if it requires them to travel long distances. Huge numbers of people travel at that time, but strictly speaking, this is different from tourism as an industry, which is the main theme of the present study.

Travel, domestic and international, and its elements and factors, such as climate and weather, change from year to year. The present study describes the general tendency of tourism in China first and its recent status in Yunnan second. Ecotourism in Kunming (昆明) and Xishuangbanna (西双版纳), both in Yunnan, South China, is analyzed after that.

The reason examples were drawn from Yunnan in this study is that the present writer studied geoecological problems in this region in the 1980s in a cooperative program between Japan and China (Yoshino, 1986; 1988; 1990). Therefore, he thought that new development, particularly tourism, during the last two decades was worth noting, based on field observations and statistical surveys.

2. Definitions and Problems
2.1 Definitions and aims
While different definitions of “ecotourism” abound, at the present stage, these definitions can be summarized as “a form of tourism which appeals to ecologically and socially conscious individuals. Because a sustainable environment is a key criterion, ecotourism should be sustainable with minimal impact on the environment. In other words, it should minimize the negative impacts caused by conventional tourism on environmental and cultural factors. It involves destinations where flora, fauna and cultural heritage are the primary attractions. Because flora and fauna are influenced directly by climatic conditions and old cultures reflect peoples’ lifestyles developed under the strong influence of climate, ecotourism has a close relationship to climatic conditions.

The aims of ecotourism are to search for and deepen knowledge of local cultures, enjoy wilderness adventures, volunteering and personal growth in learning new ways of life, and observing local landscapes, including local climatic phenomena.

2.2 Climate and tourism
Concerning the relationship between climate and tourism, it has been pointed out that climate indicators
for tourists should be studied. There were presentations on tourism-climate relationships at ISB 2008 (the 18th International Congress of Biometeorology held in Tokyo, 22-26 September 2008). For example, Freitas (2008) considered three facets: (1) thermal (e.g., temperature, humidity, solar heat load, metabolic rate/activity level), (2) physical (e.g., rain, snow, high winds, ultraviolet radiation, air quality), and (3) aesthetic (e.g., visibility, sunshine, cloudiness). For quantitative analysis, however, the criteria for “acceptable,” “unacceptable” or “ideal” conditions should be determined first, so he stressed that future research was needed with broader cross-cultural samples in diverse climatic regions.

Issues with regard to climatic conditions in the regions where tourists visit include the weather during their travels. Matzarakis and Endler (2008) dealt with climatic tourism potential for stakeholders, considering frequencies of extreme weather events based on ten-day intervals in the North Sea and Black Forest and creating frequency classes. Further development is hoped for along these lines.

Other issues include the past climate or long-term climate of the regions where tourists visit. Glacial features or desert landscapes, for example, were formed under past climate conditions through historical and geological times.

3. Recent Status of Tourism in China

3.1 An overview

During recent years, tourism has been developing in China with great speed. According to statistics from the National Bureau of Tourism, Office of Policy Laws and Regulations (2006), the growth rate of tourism in China is two times the world average. The percentage of the total population who go sightseeing reached 92.7% in China and the average expenditure for sightseeing was 436 Chinese Yuan per person in 2005, which is relatively high as compared with living costs or price standards in China. People living in urban areas pay about 1.8 times this average value, while on the other hand, those in rural areas, about 0.5 times, indicating large differences between the areas. If we define the words “sightseeing” and “tourism” strictly, we are likely to find some differences. In this paper, however, both are included within tourism, because of the data sources.

Table 1 gives statistics on domestic tourism in China in 2005. The unit of the total number of tourists is (persons × trips); for example, in the case that one person travels two times in a year, he is counted as two tourists.

We can observe that the total expenditure reached about 530 billion Chinese yuan, which implies a high average per person.

The number of tourists with the purpose of sightseeing from abroad in China is increasing sharply, as shown in Table 2. The annual growth rates of numbers of disembarkations and tourists with lodging, and revenue from tourism were more than 10% in 2005. In 2006, even though the annual growth rates of numbers of disembarkations and tourists with lodging decreased, revenue from tourism showed an annual growth rate of about 16% (Zhang et al., 2007).

Seasonal changes in visitors from abroad to China are clearly seen, as shown in Table 3. The peak occurs in October, because it is the best season from the viewpoint of climate and weather for travel and landscapes in China. A second peak occurs in December, which is connected to the Christmas holidays. June and July are the off-season, because of hot or wet conditions in almost all parts of China.

### Table 1

<table>
<thead>
<tr>
<th>Total number of tourists (100 million persons × trips)</th>
<th>Percentage of total population (%)</th>
<th>Amount of expenditure (billion Chinese yuan)</th>
<th>Average per person (yuan per person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National total</td>
<td>12.12</td>
<td>92.7</td>
<td>528.586</td>
</tr>
<tr>
<td>Urban residents</td>
<td>4.96</td>
<td>135.1</td>
<td>365.613</td>
</tr>
<tr>
<td>Rural residents</td>
<td>7.16</td>
<td>75.8</td>
<td>162.973</td>
</tr>
</tbody>
</table>

(Data source: National Bureau of Tourism, Office of Policy Laws and Regulations, 2006)

### Table 2

<table>
<thead>
<tr>
<th>Number of disembarkations</th>
<th>Number of tourists with lodging</th>
<th>Revenue from tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total*</td>
<td>Ann.gr.rate**</td>
<td>Total***</td>
</tr>
<tr>
<td>2004</td>
<td>&gt;1</td>
<td>--</td>
</tr>
<tr>
<td>2005</td>
<td>1.2</td>
<td>10.3</td>
</tr>
<tr>
<td>2006</td>
<td>1.249</td>
<td>3.9</td>
</tr>
</tbody>
</table>

(Data source: Chinese Academy of Social Sciences, Tourism Research Center (2007) and Zeng (2007).

*Unit: persons × trips, 100 millions, **An.g.rate%, *** Unit: persons × trips, 10,000s, ****Unit: 100 million US dollars)

### Table 3

<table>
<thead>
<tr>
<th>Rate (%) of disembarkation with purpose of sightseeing in 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Rate</td>
</tr>
</tbody>
</table>

(Data source: Zeng, 2007)
3.2 Tourism and the rural environment in China

Rural tourism on a village scale has been studied intensively in China in recent years. The number of studies have been increasing sharply since about 1998, as compared to the period before then. There were more than 50 studies in 2001 and 84 in 2005. Among them, about half of the studies were on themes related to agricultural tourism (Men & Zhou, 2007). In other words, we can understand that tourist farms or tourist agriculture are highly valued in rural areas of China. These studies concluded that villages should be developed in connection with tourism, with consideration given to discovery and conservation of their own traditional culture.

In rural areas located near suburban areas, tourism resources include (1) gardens surrounding main houses, store sheds, etc., (2) orchards, (3) nursery stocks of trees, (4) flower cultivation and (5) ponds, which are generally seen and form the environment of these areas at the present time. They are items for management together with food and drink, accommodations, souvenir shops, etc., existing in rural areas. Generally speaking, they are not developed gradually, but in a step-like changing pattern. According to study results obtained in the neighboring area of Chengdu in Sichuan Province, three steps were observed, occurring in 1987-1992, 1992-2004 and since 2004 (Zhang et al., 2007). Similar stages can also be observed in other areas.

Local governments have been taking strong measures against environmental destruction recently. For example, the Yunnan Province Construction Agency and Yunnan Province People’s Government fined the Vice-chairman of Xianggelila Prefecture, Yunnan Province, 90,000 Chinese yuan and discharged him in August 2006 because of his involvement in environmental destruction.

In many cases, it is difficult to promote environmental conservation in parallel with development of urban areas and succession of traditional cultures. Construction of towers, stages, tents, etc. is strictly controlled, with penalties stipulated. This is, however, subject to the discretion of persons responsible for managing and directing tourism. Of importance is how to manage natural resources and the environment for tourism.

How do Chinese tourists view the patterns of tourism? It is difficult to analyze these problems quantitatively. A questionnaire survey of ecotourists at the Baihua Shan National Reserve in the western part of Beijing (Li, 2006) obtained the following results. Comparing Chinese tourists with those from Taiwan, Canada and Poland, he found that (a) the largest numbers of Chinese tourists had the aims of “recovering from busy everyday work” and “experiencing new living styles.” On the other hand, Chinese wanting “to learn about nature,” “to enjoy outdoor entertainment,” “to see National/Provincial forest parks and “to visit rural areas” accounted for the smallest numbers of tourists. We should take into consideration that this survey was made at a forest park located near Beijing (the capital of China) under the conditions of July-September (summer vacation) 2003, when the impacts of SARS on domestic and international tourists were at an exceptionally abnormal high, as mentioned later. Nevertheless, we may conclude that Chinese tourists have relatively weaker interest in nature or ecotourism than those from abroad. Also it is worth noting that interest among the Chinese in ecotourism such as “Peoples’ festivals and traditional activities” is relatively weaker, ranking seventh from the lowest among the 32 items.

According to the questionnaire survey (Li, 2006), “transportation” was highest ranked, with “eating and drinking” ranked second, but “viewing landscapes” was ranked lowest by Chinese living in rural areas. In contrast, those living in urban areas showed equal interest in “transportation,” “eating and drinking” and “viewing landscapes.” The rate of interest in landscapes by tourists living in urban areas was three times larger than that of people living in rural areas. Such differences should be considered in discussing ecotourism in China.

3.3 Yunnan Province from the viewpoint of climatic resources

The southernmost part of Yunnan Province is at 21°30’N and the northernmost part, 29°29’N. It is located in the southeastern region of the Tibetan Plateau, having a higher altitude in the north and lower in the south. The north, at about 26°N is a mountainous area, extending to Mt. Meilixue, the highest mountain in Yunnan, with an altitude of 6,740 m a.s.l. The middle of the area, south of about 26°N, is a plateau called the Yunnan Highland or Yungui Highland, with an altitude of about 2,000 m a.s.l. The annual mean temperature is 15°C, and the monthly means range from 10°C-22°C. Summers there are cool. Therefore, the climate of Kunming has been called an “ever-spring climate.”

The boundary between the tropics and subtropics and the locations of Kunming and Jinghong, Xishuangbanna, will be discussed later. They are shown in Fig. 1.

Heat resources are greater in the south due to the lower altitudes and latitudes, indicating tropical and subtropical climates. In the north, the subtropics phase into the temperate zone climate of the highlands, as shown in Fig. 2. Therefore, there is a greater gradient in climatic conditions between the south and north. For this reason, Yunnan is sometimes said to have a “three-dimensional climate.” The tropical regions appear in valleys, occupying narrow territories, as shown in Region I of Fig. 2.

It is important to discuss such distribution patterns of climates as relevant to climatic resources for ecotourism/tourism in Yunnan, because Kunming is subtropical, while Xishuangbanna, which is dealt with in another paper (Yoshino, 2008), is tropical, despite a direct distance of only about 400 km. In particular, tropical rainforests occupy the valley bottoms and basin bottoms in the southern parts of Yunnan, and they characterize the landscape elements for tourism. From this viewpoint, the southern part of Yunnan predominates climatically,
but problems include transportation, medical services, organizational power, investment power, etc. Figure 3 shows dense fog layer formed in the basin in the morning. Above the fog layer on the mountain slope and ridge, slash and burn cultivation by the minority people is seen. Figure 4 shows fields of slash and burn cultivation on the upper part of mountain slope. These landscapes, connected to the local climate differences and human activity, are one of the important elements of ecotourism in this region.

The climatic conditions conducive to tourism in China as a whole include summer retreats, winter retreats and glacial landscapes of the high mountains of the south and southwest. Thus, adding to these two points, the Tibetan Plateau as a third point has been stressed recently. Twenty provinces (Zizhiqu) are included in the third group, representing a strong potential for tourism in China, and they include Sichuan, Yunnan, Xinjiang, Qinghai, Ningxia, Guizhou, Guangxi, Anhui and others.

Centers for tourism are shifting from urban areas, such as Beijing and Shanghai, to rural areas. Recently it has been emphasized that Yunnan together with Sichuan and Guizhou should play an important role in composing an ecotourism/tourism region in Southwest China in the winter tourism market (Liu & Zhan, 2007).
3.4 Tourism/Ecotourism in Yunnan

The development of tourism in China has occurred in four distinct periods (Matsumura & Tsujimoto, 1999): (i) 1949-1978, period of politically led development; (ii) 1978-1985, period of parallel dominance of political and economic leadership; (iii) 1986-1991, period of economic preference in leadership; and (iv) since 1992, period of economically led development. According to a more recent study (Sun, 2006), a regime change in tourism development occurred in China in 1998-2001 and it has shifted to the market system since 2002.

The Yunnan People’s Government decided in 1992 to strongly push for tourism. This decision resulted in an observable increase in the rate of tourism, up 34.2% by 1999. In recent years, not only has the quantitative development of tourism been discussed, but also the quality of tourism/ecotourism. For example, problems of how to maintain historical and traditional cultures while improving local peoples’ social and daily lives are discussed along with how to keep the natural, original landscape intact. One good example is a project for the construction of ethnic cultural and ecological villages in Yunnan (Yin, 2001), which is discussed in another paper (Yoshino, 2008). Du (2008) described Lijiang, which is harmonized with nature, water landscape in particular. The system of landscape order (snow-mountain-water-urban streets-agricultural land) was arranged in connection with a function of water.

In addition, the problem of aging of societies has been occurring in these mountainous regions recently. For instance, old villagers in Xianggelila Prefecture, a region famous for tourism in Yunnan Province, go into the mountains to collect edible wild plants (fragrant mushrooms, matsutake) and other things they can sell. For these aged farmers, it is a main source of income, earning them about 30,000 Chinese yuan at a maximum, and 10,000 yuan on average. This is one of the newly developing problems. How can their activities be managed for the sake of ecotourism in this area?

4. Numbers of Tourists and Revenue from Tourism in Yunnan

4.1 Interannual variation in tourist numbers and revenue from tourism in Yunnan

Table 4 shows the total number of tourists (unit: persons × trips), total revenue from tourism and revenue from international tourists in Yunnan from 1996 to 2005. As has been pointed out, one period of development regarding both quantity and quality ended and a new one began in 2001 in Yunnan. This is clearly revealed in Table 4, despite the lack of data from 2002.

An important point to note is that an abrupt change is clearly notable in the total revenue from tourism for the province, but not in the numbers of international tourists since 1996. After 2004, increasing of their rate is observable.

The inter-annual variations in 1998 and 2003 showed a negative increase (i.e., decrease). In the case of 1998, the decrease in tourists from abroad was accounted for mainly by Chinese living overseas in Malaysia, Hong Kong, Taiwan, Singapore, Thailand and other countries. In contrast, domestic tourists and tourists from Europe, Japan, South Korea and other countries increased. One possible explanation is that because the World Expo was held in China in 1999, many Chinese living abroad were inclined to postpone their trip home in 1998. In any case, this indicates that the behavior of Chinese living abroad is an important consideration with respect to tourism in China.

In 2003, the SARS (Severe Acute Respiratory Syndrome) outbreak occurred. This is a new type of problem the world faces today. This will be described in
detail in the next section. Here, only the impact of 2003 event on the growth rate of numbers of tourists is dealt with briefly. Growth rates of international tourists in Yunnan Province in 2003, 2004 and 2005 are –23.3%, +10.1% and +6.6% respectively, as shown in Table 4. On the other hand, using the data presented in a table (their Table 3) for Sichuan Province (Yang et al., 2008), calculated growth rates of provincial total tourists are –18.2%, +46.9% and +3.5% in 2003, 2004 and 2005, respectively. Sharp decrease in 2003, recover with anomalous increase in 2004, followed weak increase in 2005 are observed similarly in both provinces, but their deviations or ranges are smaller in Yunnan Province.

4.2 Influence of SARS on tourism in Yunnan in 2003

These days many people and huge amounts of goods move internationally/globally at great speed, and these activities have resulted in the rapid spread of AIDS (Acquired Immune Deficiency Syndrome), tuberculosis, malaria and newly developing infectious diseases such as SARS (Severe Acute Respiratory Syndrome). Actually, in the case of SARS in 2003, we have had no previous experience with such a disease, so we did not know how the damage could occur.

According to a WHO report, SARS was responsible for a total number of 8,069 deaths worldwide in 2003. Among these, 5,327 deaths occurred in mainland China and 1,755 in Hong Kong, and observable numbers of deaths occurred in countries such as Taiwan, Canada and Singapore. In summary, it can be said that 97% of the total fatalities in the world occurred in China or other closely related countries or regions.

As Table 4 shows, the number of tourists from abroad to China decreased by 23.3%, as compared with the number the preceding year. Regionally, the numbers of Chinese returning from Hong Kong, Amoi and Taiwan all decreased. In contrast, the number of domestic tourists increased slightly (1%-5%) and the revenue from then also increased about 10%, although the rates on increase in these were smaller than in other years.

It is interesting to note that these tendencies differ from area to area in Yunnan. The revenue totals from tourists in Kunming Shi (a city) and Dali Zhou (on a prefectural scale) showed clear decreases while those of Leijiang Shi, Dehong Zhou and Xishuangbanna Zhou showed increases, as shown in Table 5. In 2004, they recovered, showing growth rates in the double digits. From these circumstances we can conclude that even in south Yunnan, SARS had a clear impact on the numbers

<table>
<thead>
<tr>
<th>Year</th>
<th>Total revenue from tourism (× 100 million Chinese yuan)</th>
<th>Growth rate from preceding year (%)</th>
<th>Numbers of international tourists (persons × trips)</th>
<th>Growth rate from preceding year (%)</th>
<th>Revenue from international tourists (× 100 million US dollars)</th>
<th>Growth rate from preceding year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>221.</td>
<td>+34.0</td>
<td>74.</td>
<td>+24.4</td>
<td>2.2</td>
<td>+34.0</td>
</tr>
<tr>
<td>1997</td>
<td>119.</td>
<td>–9.0</td>
<td>82.</td>
<td>+10.8</td>
<td>2.6</td>
<td>+18.2</td>
</tr>
<tr>
<td>1998</td>
<td>137.</td>
<td>+15.1</td>
<td>76.</td>
<td>–7.3</td>
<td>2.7</td>
<td>+0.2</td>
</tr>
<tr>
<td>1999</td>
<td>204.</td>
<td>+48.9</td>
<td>104.</td>
<td>+36.7</td>
<td>3.5</td>
<td>+29.6</td>
</tr>
<tr>
<td>2000</td>
<td>211.</td>
<td>+3.5</td>
<td>100.</td>
<td>–3.7</td>
<td>3.4</td>
<td>–2.9</td>
</tr>
<tr>
<td>2001</td>
<td>257.</td>
<td>+21.6</td>
<td>110.</td>
<td>+9.8</td>
<td>3.7</td>
<td>+8.8</td>
</tr>
<tr>
<td>2003</td>
<td>306.64</td>
<td>+5.7</td>
<td>100.01</td>
<td>–23.3</td>
<td>3.40</td>
<td>–18.9</td>
</tr>
<tr>
<td>2004</td>
<td>369.27</td>
<td>+20.4</td>
<td>110.01</td>
<td>+10.1</td>
<td>4.22</td>
<td>+24.1</td>
</tr>
<tr>
<td>2005</td>
<td>430.14</td>
<td>+6.5</td>
<td>182.28</td>
<td>+6.6</td>
<td>4.46</td>
<td>+5.9</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Incr.</th>
<th>Total</th>
<th>Incr.</th>
<th>Total</th>
<th>Incr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>5,168.80</td>
<td>+1.15%</td>
<td>6,010.64</td>
<td>+16.3%</td>
<td>6,860.74</td>
<td>+14.1%</td>
</tr>
<tr>
<td>2004</td>
<td>278.31</td>
<td>+9.14%</td>
<td>334.08</td>
<td>+20.0%</td>
<td>386.15</td>
<td>+15.6%</td>
</tr>
<tr>
<td>2005</td>
<td>306.64</td>
<td>+5.67%</td>
<td>369.27</td>
<td>+20.4%</td>
<td>430.14</td>
<td>+16.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Total revenue from tourism by city (Shi) or prefecture (Zhou) (× 100 million Ch. yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Kunning Shi 136.35 –3.6%</td>
</tr>
<tr>
<td>2004</td>
<td>137.51</td>
</tr>
<tr>
<td>2005</td>
<td>138.45</td>
</tr>
</tbody>
</table>

Note: The growth rate was calculated by difference from the preceding year. Data source: Yunnan Almanac, published yearly.
of tourists and total revenue from tourists in 2003, but the degree of impact differed considerably from area to area.

In 2003, the reduction in numbers of domestic tourists was particularly noticeable among travelers using railways. The figure is omitted here due to space limitations. The numbers of travelers using roads (cars), waterways (ships) and airplanes showed no marked decrease. This is thought to be due to the geographical situation of Yunnan, including its distance, mountainous regions and level of transportation for domestic people in general in the period around 2003.

5. Summary

In order to discuss the problems in ecotourism and climate in Yunnan, the recent development of tourism in China was first presented. Sharp increase is shown in the numbers of tourists and revenue from tourism. In the second part, the status of Yunnan was described. The roles of minorities are important and also, different living situations in the mountains, such as valley bottoms and basin bottoms by Thai peoples and in contrast, mountain ridge or upper part of the mountain slopes by other minorities, are fundamental for consideration of problems.

Main results to be noted are summarized as follows: (1) Growth rate of tourism in China is two times the world average. Total expenditure reached about 530 billion Chinese Yuan, which implies a high average per person. (2) Seasonal changes in visitors from abroad to China are clearly seen with a peak in October. (3) In particular, agricultural tourism together with ecotourism is developing, showing step-like changing patterns. (4) The southern part of Yunnan predominates climatically, but problems include transportation, medical services, organizational power, investment power etc. (5) Regarding to both quantity and quality, one period of developing ended and entered new one began in 2001. In particular, sharp increasing of growth rate is found since 2004. (6) Impacts of SARS in 2003 on the numbers of tourists were seen clearly by decreasing of 23%, as compared with the preceding year. (7) Reduction in numbers of domestic tourists in 2003 was particularly notable among travelers using railways.

Acknowledgement

The writer would like to express his heartfelt thanks to Prof. Yin Shaoting, Anthropology Museum, Yunnan University, for valuable suggestions and discussions on the present study, and Prof. Shigeru Shirasaka, College of Tourism, Rikkyo University, for comments, reading manuscript. A part of study was supported by a 2007 FY Project of the Nippon Resources Association.

References


Masatoshi YOSHINO

Born in Tokyo on 1 January 1928, Masatoshi Yoshino graduated from Tokyo Bunrika University, BA in 1951 and MA in 1953, majoring in geoscience, particularly climatology. He obtained his Doctor of Science in 1961. He was a research fellow of Alexander-von-Humboldt Foundation, 1961-63, at the University Bonn, Germany. He was an Associate Professor at Hosei University, Tokyo, 1968-70, Full Professor at the same University, 1970-74, Full Professor at the Institute of Geoscience, University Tsukuba, Japan, 1974-91 and at the Department of Geography, Aichi University, Japan, 1991-97. Currently, he is a Professor Emeritus at the University Tsukuba and Senior Programme Advisor, Sustainable Environmental Development, United Nations University. In the past he has served as President of the Association of Japanese Geographers and of the Japanese Arid Land Studies, Vice-president of International Geographical Union (IGU) and Former chairman of the National Committee of International Geosphere-Biosphere Programme (IGBP) in Japan. He has published many books, including “Climate in a small area,” (University of Tokyo Press, 1975), in English, 549 pages, and about 300 articles. He served as a chairman of the editorial committee of “Global Environmental Research” for Volumes 1 to 6.

(Received 4 November 2008, Accepted 14 December 2008)