

## **Japan (Dai Nihon / Nippon)**

**Last updated: 31-01-2004**

### **Location and area**

Japan is an island monarchy in East Asia, bounded on the north by the Sea of Okhotsk, on the east by the Pacific Ocean, on the south by the Pacific Ocean and the East China Sea, and on the west by the Korea Strait and the Sea of Japan (East Sea). The total area of Japan is 377,837 km<sup>2</sup>. (Microsoft Encarta Encyclopedia 2002).

### **Topography**

Japan consists of the large islands of Hokkaido (the northernmost), Honshu (the largest, called the mainland), Shikoku, and Kyushu (the southernmost), the Ryukyu Islands, and more than 1,000 lesser adjacent islands.

The islands of Japan are the projecting summits of a huge chain of mountains. Volcanoes are common; some 200 volcanoes are known, about 50 of which are still active. The highest peak, at 3,776 m, is Fuji, an extinct volcano near Yokohama. Thermal springs and volcanic areas emitting gases are numerous.

The Japanese plains lie chiefly along the lower courses of the principal rivers, on plateaux along the lowest slopes of mountain ranges, and on lowlands along the seacoast. The most extensive plains are in Hokkaido: along the Ishikari River in the western part of the island, along the Tokachi River in the southeast, and around the cities of Nemuro and Kushiro on the east-central shore. Honshu has several large plains. The Osaka plain contains the cities of Kobe, Kyoto, and Osaka; the Kanto plain is the site of Tokyo; and Nagoya is the main city of the plain of Nobi. The Tsukushi plain is the most important level area in Kyushu. (Microsoft Encarta Encyclopedia 2002).

### **Climate**

The Japanese islands extend through approximately 17° of latitude, and Japan's climatic conditions consequently vary widely. Average mean temperatures range from about 5° C in Nemuro (Hokkaido) to about 16° C on Okinawa. Short summers and severe long winters characterize Hokkaido and the northern part of Honshu. The severity of the winters is caused in great part by the north-western winds blowing from Siberia and the cold Okhotsk (or Oyashio) Current, which flows south into the Sea of Japan. To the south and east of this region the winters are considerably moderated by the influence of the warm Kuroshio (or Japan) Current. In Shikoku, Kyushu, and southern Honshu the summers are hot and humid, almost subtropical, and the winters are mild with comparatively little snow. Japan lies in the path of the southeastern monsoons, which add considerably to the oppressive humidity of the summers. Yearly precipitation ranges from about 1,000 mm on Hokkaido to 3,800 mm in the mountains of central Honshu. (Microsoft Encarta Encyclopedia 2002).

### **Water**

Japan is abundantly watered - almost every valley has a stream. The longest river in Japan (370 km) is the Shinano on Honshu; other large rivers on Honshu are the Tone, Kitakami,

Tenryu, and Mogami. The important rivers of Hokkaido include the second-largest river of Japan, the Ishikari, and the Teshio and Tokachi. The Yoshino is the longest river in Shikoku. The many Japanese lakes are noted for their scenic beauty. Some are located in the river valleys, but the majority are mountain lakes. The largest lake in Japan is Biwa, on Honshu, which covers about 685 km<sup>2</sup>. (Microsoft Encarta Encyclopedia 2002).

## Land use

Only an estimated 11 % is arable land, of which more than 40 % is devoted to rice production (Microsoft Encarta Encyclopedia 2002).

## Peatlands

Peatlands can be found on all main islands (Schneider & Schneider 1990). Sakaguchi (1961) presents a map of Japanese “peat bogs” scale 1/10,250,000 with a more detailed map of Hokkaido. Sakaguchi (1979) gives an overview on their distribution and genesis.

The major part of the peatlands can be found on the northernmost main island Hokkaido.

Von Bülow (1929) mentions a “peatland” area for Hokkaido of about 2,500 km<sup>2</sup>.

Sakaguchi (1961) mentions a maximum Holocene area of “peat bogs” (being “places accumulating peat, ... whether the peat layer is thin, or whether hydrophytes are not even growing there”) for Hokkaido of 1,900 km<sup>2</sup>.

Schneider (1958), probably on the basis of Anonymus (1954), gives a “peatland” area for Hokkaido of 2,000 km<sup>2</sup>. Also Tibbets (1969), on the basis of data of H. Seo and S. Shoji (2<sup>nd</sup> Int. Peat Congr. Leningrad 1963), mentions a “peat bog” area in Hokkaido of 2,000 km<sup>2</sup>, a figure also used by Kivinen & Pakarinen (1980, 1981) for the peatland area (> 30 cm peat) of Hokkaido. Moore & Bellamy (1974), Schneider (1976), and Markov et al. (1988), however, use this figure of 2,000 km<sup>2</sup> for the “peat resources”, the “peatland” area, and the peatland area (> 30 cm peat) respectively of *total* Japan.

Otawa (1975) presents a “peatland” area for Hokkaido of 2,190 km<sup>2</sup>. Schneider (1980) presents this figure of 2,190 km<sup>2</sup> also for Hokkaido, but uses that figure later for *total* Japan (Schneider & Schneider 1990, Pfadenhauer et al. 1993). Umeda et al. (1991) mention a similar area of 2,200 km<sup>2</sup> for the “peatland” area of total Japan.

The figure of Ottawa (1975) is also the base of Bord na Mona (1985) who mentions for Hokkaido a peatland area of *over* 2,000 km<sup>2</sup>. Yano et al. (1980) mentions an area for Hokkaido of *about* 2,000 km<sup>2</sup>. Huaining (1994) mentions a „mire“ area for Japan (mainly Hokkaido) of *nearly* 200 km<sup>2</sup> (20,000 ha) Check: possible calculation mistake!

For Honshu Ottawa (1975) presents a “peatland” area of 370 km<sup>2</sup>, a figure that is quoted by Bord na Mona (1985) for peatlands (> 30 cm peat). Schneider & Schneider (1990) mention a peatland area on Honshu of 360 km<sup>2</sup>, but their source is unclear (Ottawa 1975?, Yano et al. 1980?).

On Honshu many km<sup>2</sup> of sediment covered peatlands are found in Tokyo and its surroundings (Nakagawa Lowland, Kanogawa valley) (Sakaguchi 1961). Sakaguchi (1961) quotes many more peatland occurrences on Honshu and refers, e.g., to Tojo (1892, 1893), who studied “peat bogs” in the Ugo District. The Ozegahara *Sphagnum* peatland (1400 m a.s.l.) in the mountainland of Honshu covers an area of 7.6 km<sup>2</sup> and is since 1934 included in the Nikko National Park (Sakaguchi 1961, 2000). The peatlands of Honshu also include a number of small to medium sized mires in the Minami Aizu district of Fukushima Prefecture (altitude: 600-1100 m), including Miyatoko (6.5 ha), Komado (27.3 ha), Takashimizu (3 ha), and

Yanohara (20.6 ha) (Iwakuma (1996). The Miyatoko mire is relatively intact, the condition of the other mires is not mentioned. The Akaijachi peatland (43.56 ha) is drained.

Otawa (1975) gives a “peatland” area for Kyushu of 35 km<sup>2</sup>, a figure that is quoted by Bord na Mona (1985) for peatlands (> 30 cm peat). Schneider & Schneider (1990) mention a peatland area on Kyushu of 34 km<sup>2</sup> but their source is unclear (Otawa 1975?, Yano et al. 1980?).

Schneider & Schneider (1990) mention a peatland area on Shikoku of 0.4 km<sup>2</sup> but their source is unclear (Otawa 1975?, Yano et al. 1980?).

Kivinen & Pakarinen (1981) and Bord na Mona (1985) estimate the extent of peatlands for total Japan on 2,500 km<sup>2</sup>. Andriess (1988) uses the same figure for the total of organic soils in Japan. Markov et al. (1988) estimate the area of „peat resources“ (peat thickness not mentioned) in Japan as being 3,000 km<sup>2</sup>.

According to Sakaguchi (1979) the original peatland area in Japan was 2,006.42 km<sup>2</sup>, consisting of 1,417.53 km<sup>2</sup> of “eutrophic”, 249.26 km<sup>2</sup> of “mesotrophic” and 339.63 km<sup>2</sup> of “oligotrophic” peatlands. These data are based on investigations from the period 1917-28, of which the results were only compiled after World War II and exclude the greater part of the mountain regions. Peatlands are areas with 20 cm of drained or 30 cm of undrained peat, the peat consisting of >50% organic material. The same figure is given by Iwakuma (1995, 1996) and Umeda & Inoue (1996) for the peatland area of Hokkaido.

According to the interpreted World Soil Map (Van Engelen & Huting 2002) 3,621 km<sup>2</sup> of histosols exist in xxxx and 13,047 km<sup>2</sup> of gley soils.

### **Mire and peatland losses**

According to Himiyama (1994), the wetland area in Japan has decreased from 1,340 km<sup>2</sup> around 1920, via 800 km<sup>2</sup> around 1955, to 690 km<sup>2</sup> in 1985 because of drainage of most lowland wetlands. In every period Hokkaido had about 90% of the entire Japanese wetland. The status of peatlands in Japan is also largely determined by the developments on Hokkaido.

According to Schneider (1958) 900 km<sup>2</sup> of the 1,200 km<sup>2</sup> large Ishikari peatland on Hokkaido were already cultivated. Tibbets (1969), on the basis of data of H. Seo and S. Shoji (2<sup>nd</sup> Int. Peat Congr. Leningrad 1963), mentions that 700 km<sup>2</sup> of Hokkaido’s “peat bogs” are used for rice cultivation.

According to Sakaguchi (1979) about 62% of the mires in Hokkaido/or total Japan? is modified by agriculture and urbanization and only 760 km<sup>2</sup> (38% of former area) have survived. These figures are repeated for Hokkaido by Iwakuma (1995). Also Koji & Wolejko (1990) state that more than 50% of the former lowland mire area is utilized. Umeda & Inoue (1996) mention that a greater part of the lowland peatlands of Hokkaido is used for farmland and rice cultivation (Tohoku region, southern and central Hokkaido) or grassland and dairy farming (north and eastern part of Hokkaido). Igarashi et al. (1984) describe how rice is cultivated in the Ishikari-complex after covering the peatland with a thin layer of mineral soil. Only in the northern and eastern part of Hokkaido large wetland areas survive, including the Bibai and Tsukigami mires (only a few ha), the Sarobetsu and Kushiro mires with quite large areas of undisturbed peatlands, and Kiritappu, Bikanbeushi, and part of the Shibetsu mire in the mountains. The Kushiro mires covered about 250 km<sup>2</sup> (Sakaguchi 1961). The present

Kushiro Ramsar site covers an area of 182.9 km<sup>2</sup>; its northern central area remains undeveloped.

Since the report of Sakaguchi (1979) new mires have been reclaimed for agriculture. Schneider & Schneider (1990) refer to the Sarobetsu mire that is increasingly converted to grassland. The generally small peatlands on Honshu, Shikoku, and Kyushu are partly used for agriculture.

Tachibana et al. (1996, p. 9) present a list of 28 mires of Hokkaido and mention the mires often as being drained or embanked. They call the Beganbeushi mire (8 km<sup>2</sup>) “the only remaining primeval lowland mire in Hokkaido“.

According to Umeda et al. (1991) approx. half of the 550 km<sup>2</sup> of “peatlands” in the Ishikari river basin area (Hokkaido) has been reclaimed for paddy fields. Yazawa et al. (2000) present an overview of the land use in these Ishikari peatlands (table xxx).

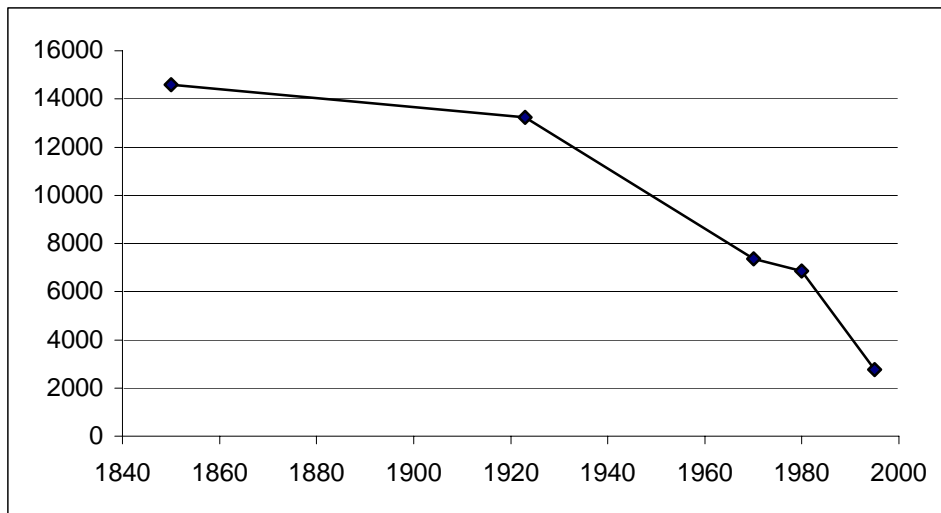
Some peatlands in Japan are also strongly influenced by intensive tourism (Miyawaki & Fujiwara 1968).

Table xxx: Area of peatland in the Ishikari peatlands (Hokkaido) and the present land use (After Yazawa et al. 2000, tab. 1+2, p. 821, 822).

peatland	land area (ha)	pond area (ha)	land use (%)				barren land (%) <sup>*)</sup>
			agricul-tural	urban	natural forest	natural waters	
Bibai	19,048.3	157.6	88.1	3.5	2.1	3.3	3.0
Shinotsu-Tobetsu	14,844.0	24.3	81.3	1.7	3.2	7.0	6.8
Horomui	7,907.3	20.6	82.9	4.6	2.5	7.2	2.8
Osatsu-Nakanosawa	4,715.9	2.8	84.6	9.0	3.1	1.5	1.8
Tsuishikari	7,340.4	1.0	40.7	28.0	0.7	8.9	21.6
Teine	4,139.3	0.04	27.8	51.5	4.4	2.5	13.9

<sup>\*)</sup> including agricultural land in suburban areas temporarily unused and natural barren

Fig. xxx: Changes in the mire area (y axis in ha) of Sarobetsu mire, northern Hokkaido, Japan (after Fujita et al. 2000). The “original” peatland area of 14,600 ha was attributed to 1850



Pictures of Japanese peatlands/mires can be found under: <http://www.ipcc.ie/wpjapan.html>