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Newsletter on MAB Activity of Japan
Japanese Coordinating Committee for MAB

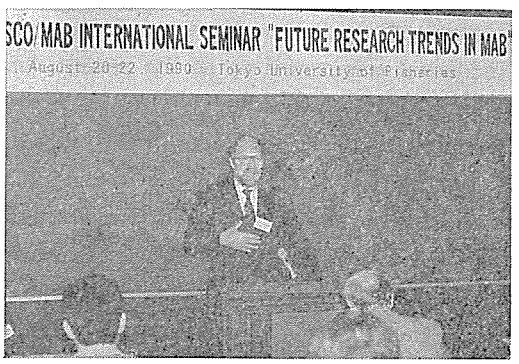
Unesco/MAB International Seminar: Future Research Trends in MAB (FRTM)

August 20-22, 1990

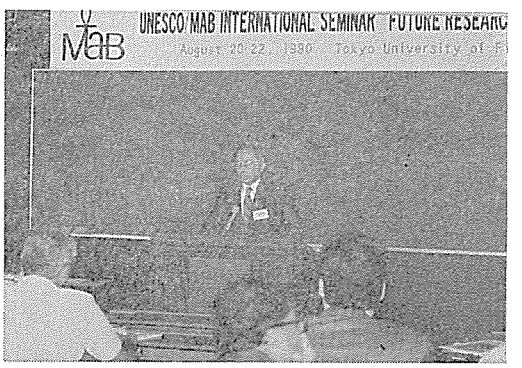
Yusho ARUGA

Unesco/MAB International Seminar "Future Research Trends in MAB (FRTM)" was held at Tokyo University of Fisheries in Tokyo, August 20-22, 1990. It was organized by Japanese National Committee for MAB and Tokyo Universiy of Fisheries in cooperation with Unesco. The purpose of the seminar is to discuss the pilot projects of Unesco's "Man and the Biosphere Programme (MAB)" and to contribute to sustainable development. The seminar fundamentally follows activities of the past six meetings of MICE (Man's Impact on the Coastal and Estuarine Ecosystems) held in Japan, Indonesia, Thailand and China during 1984-1988 and of BICEM (Methods of Biological Inventory and Cartography for Ecosystem Management) held in Japan in 1989, both were regional seminars suppoted by Unesco and the Japanese Government. The total number of participants in the FRTM seminar was more than 80 including 32 from abroad (Australia 2, Czechoslovakia 1, China 2, Egypt 2, Unesco 1, Hungary 1, India 2, Indonesia 3, Korea 1, Malaysia 4, Netherland 1, Poland 1, Romania 1, Sweden 1, Thailand 6, U.S.R. 1).

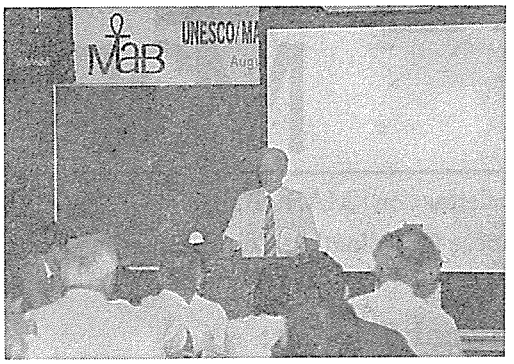
On August 20, the opening ceremony was chaired by Professor Y. Aruga and four distiguished speakers released their addresses: Professor Y. Takai, Chairman of Japanese National Committee for MAB, Mr. Nishimura, Deputy Director-General, Minister's Secretariat, Ministry of Education, Science and Culture of



Dr. B. von Droste addressing at the opening ceremony.



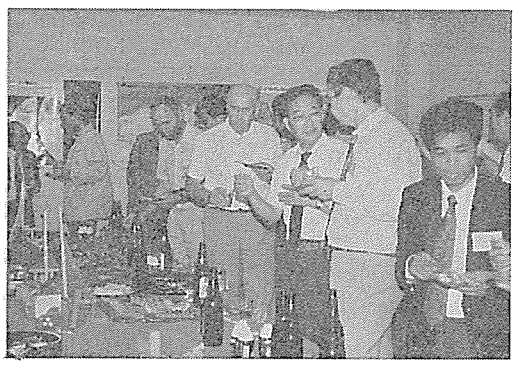
Professor Y. Takai addressing at the opening ceremony.



Professor Per Brinck presenting a paper.

Japan, Dr. B. von Droste, Director of Unesco's Division of Ecological Sciences, and Dr. M. Nomura, President of the Tokyo University of Fisheries. After the opening ceremony Dr. B. von Droste (Unesco) gave the keynote lecture "Future Research Trends in MAB", which was followed by Session (1) Rehabilitation of Coastal Fishery Areas and of Other Ecosystems. In the session, 8 papers were presented by Dr. Absornsuda Siripong (Thailand), Dr. Francisco Dallmeier (USA), Dr. Eisuke Kikuchi (Japan), Dr. Maciej Zalewski (Poland), Dr. Akira Otsuki (Japan), Dr. Tetsuo Yanagi (Japan), Dr. Chan Hung Tuck (Malaysia), and Dr. Rochadi Abdulhadi (Indonesia) and discussed.

In the evening of August 20, Dr. M. Nomura, President of the Tokyo University of Fisheries, hosted the welcome reception at the University. All the participants enjoyed hospitality and Japanese dishes.



Welcome reception at Tokyo University of Fisheries.

On August 21, two sessions were carried out. In Session (2) Developmet of Methods for Improving the Estimates of Ecosystem Dynamics towards Sustainable Ecosystem Management, 7 papers were presented by Dr. B. K. Senapati (Inida), Dr. Florea Niculae (Romania), Dr. Kasem Chunkao (Thailand), Robwert Neuhäusl (Czechoslovakia), Dr. R. S. Volskis (USSR)*, Dr. Li Wenhua (China), and Dr. R. B. Singh (India) and discussed [* briefly introduced by Dr. V. M. Neronov for the absence of Dr. Volskis]. In Session (3) Contribution of "Man and the Biosphere" Programme to Global Changes Studies, 5 papers by Dr. P.M. Sivalingam (Malaysia), Dr. G. Varallyay (Hungary), Dr. Satoshi Matsumoto (Japan), Dr. V.

Observing automatic feeders from the boat in Lake Kasumigaura.

M. Neronov (USSR), and Dr. Per Brinck (Sweden) were presented and disscussed. At the end of the sessions Dr. W. G. Sombroek (Netherland) and Dr. Kuswata Kartawinata (Indonesia) commented on all the presentations and discussions.

On August 22, an excursion was conducted by bus to Tsukuba Science City, visiting National Institute for Environmental Studies, Forestry and Forest Products Research Institute, and Lake Kasumigaura. The participants were divided into two groups and separately visited the two institutes. After lunch all the participants went on board the ship and observed

water and fish culture in Lake Kasumigaura, one of the most eutrophied freshwater lakes in Japan. Friendly exchanges among the participants were continuously made during the bus tour.

The regional business meeting of east and southeast Asian countries was held on August 21 evening. After presenting the summary of each national MAB activities, discussions were centered on future bilateral and multilateral regional cooperations. The participants agreed to ask Malaysian delegate to arrange the next international or regional MAB seminar in Malaysia in 1991.

(Tokyo University of Fisheries)

Relationship between Vegetation Types and Soil Units at Mt. Garyu, Southwest Japan

Tukasa HUKUSIMA

About three thousand years ago Japanese beech (*Fagus crenata*) covered Japanese islands in a cool temperate zone. However, the development of beech forests is in most cases restricted to mountain summits above the elevation of 1000 m except for the southern Hokkaido, and the northern part of Tohoku area, owing to human interferences such as an overcutting and management of pasture ground. Now "Protection of Beech" is symbolized as a movement of forest protection in Japan.

Mt. Garyu is located in the western end of the Chugoku mountains, and its elevation is 1223.9 m a. s. l., in which natural *Fagus caenata*

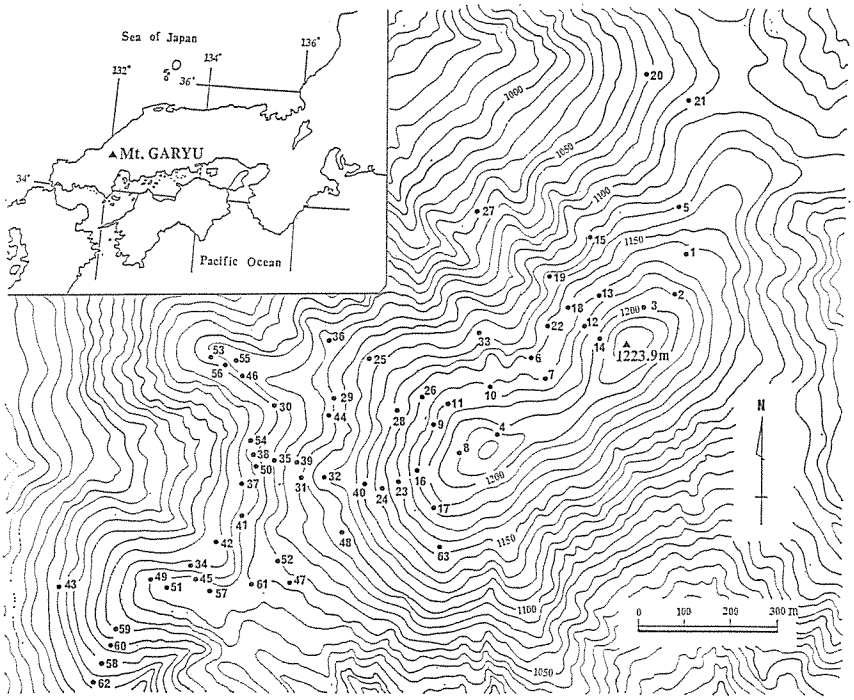


Fig. 1. Geographical map of Mt. Garyu. • Sites of vegetation survey.

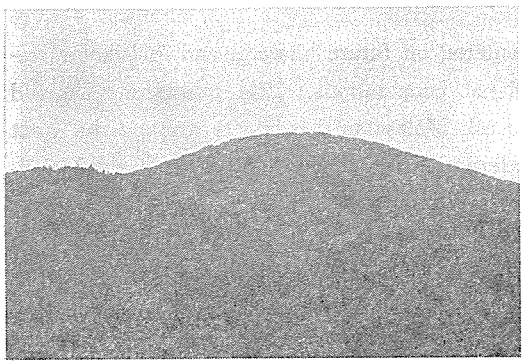


Fig. 2. *Lindero umbellatae-Fagetum crenatae* association at Mt. Garyu.

forest is distributed above 900 m on the north and west slope (Figs. 1 and 2). The vegetation survey of 81 sites was carried out. Based on the floristic composition, the forest at Mt. Garyu was identified to the association, *Lindero umbellatae-Fagetum crenatae* (Sasaki, 1964) (Fig. 3). It is obvious from this study that *Ligustrum tschonoskii* subassociation in lower category which was recongnized as a wet mesic plant community was observed on a gentle ridge with relatively moist water legime and that *Shortia soldanelloides* var. *magna* subassociation generally recognized as a dry mesic plant community was identified on a slope. From soil survey Ultisols (red and yellow soils) with shallow Andic surface horizons derived from volcanic materials were found on the higher and older terrace and crest in this area, which were formed in the warmer temperate during the latest interglacial epoch. Larger water holding capacites of Ultisols attributed to heavy clay texture contributed the domination of wet mesic vegetation type to the ridges in this study area. Similar results were obtained at Mt. Hiba, having Ultisols on older terrace.

It is intersting that these vegetation distributions were quite different from those on the volcanic materials at Mt. Daisen and Mt. Sambe in Chugoku mountains, because of slower downward permeability of water in the subsurface horizons.

Fig. 3. *Fagus crenata* forest at Mt. Garyu.

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(Tokyo University of Agriculture and Technology)

Soils in the Bhutan Himalaya

Masanori OKAZAKI

The Kingdom of Bhutan lies in the eastern Himalaya and covers an area of 47000 km². It can be divided into three sections, the Sub-Himalaya (Outer Himalaya) in the south, the Inner Himalaya in the middle, and the Great Himalaya in the north, from 140 to more than 7000 m above sea level.

The information on soils distributed in Bhutan is seriously limited, because of the steep gradient and severe accessibility. However, Karan (1967) reported the zonal soils in Bhutan, which consisted of Alpine meadow soils, Podzols, Brown soils and Red and Yellow soils according to the elevation without any detailed data on soil properties. After this description there is no academic report on Bhutaneses oils. However, FAO (1983) took the soil survey as a basic investigation for the development of agriculture at four developing area in Thashigang and Mongar Districts, and indicated the distribution of soils, land capability and preliminary geotechnical maps with some physical and chemical data. A scientific soil survey has not been carried out, although UNDP/FAO (1983) prepared the detailed landuse and vegetation map of Bhutan with a scale of 1:250,000 using satellite imagery. For the first time Sargent (1984) represented some limited properties of forest soils in western to eastern Bhutan ranged from 200 to 4000 m above sea level. From her results forest soils in Bhutan are shallow and azonal, and their pH values varying between about 5 and 7. Although Okazaki (1987) also indicated some chemical properties of soils vertically distributed in Bhutan (Fig. 1), there are very little information on soils in Bhutan.

Five major soil types, Alpine meadow soils (more than 4200 m), Podzols (3300 to 4200 m),

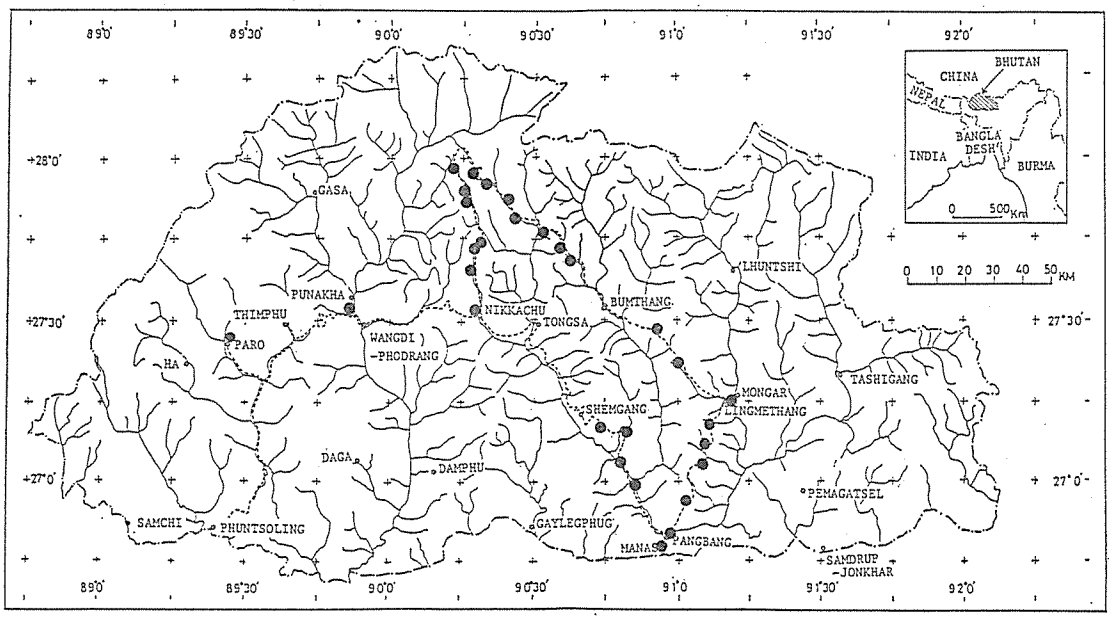

Fig. 1. Topographical map of Bhutan. ● Sampling site.

Brown forest soils (2400 to 3300 m), Yellow brown forest soils (1300 to 2400 m), and Yellow soils (less than 1300 m), were vertically described in the survey. The distribution and characteristics of these soils can be shown according to the altitude. Totally 167 soil samples from 80 profiles were collected and analyzed in the laboratory after air-drying. The mean values of soil pH among five soil types showed no large difference, ranged from 5.30 to 6.03. There are relatively enormous dissimilarities in mean values of electrical conductivity, varied from 57.6 to 206 $\mu g\,cm^{-1}$. These facts show Himalayan soils are derived from granite and granitic gneisses which are low in base except for potassium and develop zonal matured soils. The mean values of organic carbon concentrations were highest in Podzols under *Abies-Rhododendron* forest and lowest in Yellow soils under broad-leaved forest, ranged from 2.41 to 12.4%. This tendency of distribution of organic carbon concentrations among five soil types would be similar to that of Japanese soils distributed in mountainous area of the humid climate (Kondo, 1967). There was a great variation in mean values of phosphate absorption coefficients (PAC), 733 to 1470 mg P_2O_5/100 g of soil suggesting the different concentrations of iron and aluminum compounds and organic matter. The highest value of PAC is in Brown forest soils and the lowest in Yellow soils. The mean values of cation exchange capacities were relatively low and varied from 16.7 to 37.6 me/100 g of soil. The mean exchangeable cations concentrations except for potassium derived from muscovite and biotite in leucogranite (Gansser, 1983) also showed low values, 1.67 to 21.0 me/100 g for Ca, 0.537 to 5.32 me/100 g for Mg, 0.173 to 1.28 me/100 g for K, and 0.0950 to 0.141 me/100 g for Na.

It is clear from these results that Alpine meadow soils in Bhutan Himalaya have shallow organic A horizons, weakly acidic soil reaction, medium humus concentration, low phosphate retention, low CEC and low exchangeable cations concentrations. The humus and iron accumulated Bhir horizon was morphologically characterized in Podzols and its acidic soil reaction was caused by low exchangeable cations, and high humus concentrations accumulated with low mineralization. Brown forest soils under *Acer-Tsuga* forest indicated strongly acidic soil reaction, high humus concentrations, considerably high phosphate retention, and low base saturation. Yellow brown forest soils distinguished by brighter yellow colored B horizons develop under the temperate evergreen broad-leaved forest which is characteristic to East Asia. Their chemical properties were slightly acidic soil reaction, medium humus concentrations, high CEC and high exchangeable cations concentrations. Yellow soils appeared in the lowest altitude show weakly acidic soil reaction, and low humus concentrations, low exchangeable cations concentrations and low base saturation.

More detailed data should be necessary to conserve soils and to make landuse planning of Bhutan Himalaya.

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(Tokyo University of Agriculture and Technology)

A Story of Pedology and Ecology

Ryunosuke HAMADA

ICSS (International Congress of Soil Science) and INTECOL (International Congress of Ecology) were held in Iapan during August, 1990. This may be a step for revisions for human activities on global scale, aiming to attain optimization for sustainable presence of mankind on the earth.

The summer in 1990 was a season for Japanese soil scientists and ecologists to host a memorable international meetings. They were ICSS and INTECOL. Both meetings had around 2000 participants from more than 70 countries.

Both meetings of ICSS and INTECOL must have some degree of intent to elucidate the future prospect of mankind on global scale approach.

Pedology as a foundation of soil science as a whole or the science related to soil has a common background with Ecology in its structure or approach of science. We can actually find this similarity in the statements of H. Jenney (1941, Factors of Soil Formation, McGraw-Hill) and R. Tüxen (1931/1932, Der Biologie (München)). According to H. Jenney (1980, The Soil Resource, Ecological Sudies 37, Springer-Verlag), V.V. Dokuchaev (1898) performed formulation that soil=f(cl, o, p) tr, in which time factor (tr) had somewhat different position, topography factor (r) did not appear as is usually found commonly known formula of soil=f (cl, o, r, p, t). As most of us may know it, this fomula explains that climate (cl), organism (o), relief (r), parent material (p), and time (t) are the factors which influence the nature of soil. It seems to be that relief was put into consideration after "potent factor" formula proposal by C.F. Shaw (1930, Ecology)

To recognize vegetation, R. Tüxen expressed vegetation (v) as a function of climate (cl), soil (S), and man (oh), as v=f (cl, S, oh). Everyman notices a similarity of a formula of factors of soil formation with this Tüxen's vegetation formula. Background concepts are also quite similar. Naturally, there is a difference with its subject, one is the subject is soil for the other it is vegetation.

However, more critical difference between the two areas of science is the difference in the interests to human activities. Tüxen proposed a factor of (oh) independently. On the contrary, in the formula of soil there is no such independent factor. It is considered as a part of factor (o), that is, organism which originally contains vegetation and animal. Recent trends with this point are to put more emphasis on this human factor, but not so strong as the Tüxen's case. In Tüxen's concept, there is a significant meaning even from the beginning. In my understanding, Tüxen's concept of "potential natural vegetation" cannot be understood neglecting the influence of human activity to vegetation. The human factor is essential as a fundamental and basic concept to establish a framework of vegetation science. This consideration on human factor has resulted in the profound philosophical difference between the two fields of science, that is, Pedology and Ecology. These differences evidently reflected to the features and characteristics of both ICSS and INTECOL. It may be rather trifle things, but the ways and handling manner of the meeting showed their own characters of the two congresses. ICSS had steered the meeting

with more solid and straight forward manner. INTECOL was carried out with more flexible and sense of free attitude which seemed to have more potentials of expanding the related area to Ecology. But these individual so to speak personality of the two congresses had their own meaning and it is rather hard to say which is better.

As to the similarity of two areas of sciences, Pedology and Ecology, we have to add something more about it. When we are looking back in the past, almost 300 years of history of modern science, it was recognized to be developed with a basic principle of "analytical approach", which is still quite actively practiced in the present days. In addition to this "analytical approach", there is another appoach called "holistic approach" which must have been used quite often recently since probably from the beginning of 1970's. This period of time was the days incidentally conincided with more environment conscious mood being started to prevail. One can realize the approach of both Pedology and Ecology have something in common of thier attitudes. That is "holistic approach". In the field of biology the term "holism" can be traced back to the publication of "Holism and Evolution" by J. C. Smuts in 1926. In those days, Pedology and Ecology were getting to be formulated as a branch of science. In the history of modern science, the "holistic approach" has quite short historical past as is considered to be less than 90 years. On the contrary, "analytical approach" is quite commonly, even with unconsciously, accepted and practiced. However, as is realized by the fact of publication of reprints of J. C. Smuts' Holism and Evolution in 1973, "holistic approach" has attracted attention again these days.

(Tokyo University of Agriculture and Technology)