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KAGOSHIMA UNIVERSITY
RESEARCH CENTER FOR THE PACIFIC ISLANDS

CONTENTS

Front Page Photo: A farmer at Sylhet, Bangladesh. (Photo by T. Hhidaka, Research Center for the Pacific Islands, Kagoshima University)

Crop Production in Bangladesh: Status, Challenges Ahead and Strategic Research that Needs to be Strengthened

Md. Abdul Karim
Kagoshima University Research Center for the Pacific Islands, Japan
(Bangabandhu Agricultural University, Bangladesh)

Bangladesh is situated between latitudes 20.34` - 26.39 ` north and longitudes 88.0` - 92.41` east. Being an agrarian country, the population growth has been continuously high, though an appreciable shift in the rate from 2.4 % to 1.54% observed recently. Due to the high population growth and consequently, adoption of the green revolution policy, the country put major attention on to increase cereal production. Import of irrigation implements, especially shallow tube well (STW) is deregulated and fertilizer business has been privatized. As a result, both irrigation areas and use of fertilizers have been increased substantially. However, the impact of the policy fall on mainly cereal production, more specifically on rice production. Cereal production has been increased significantly since the last two decades. Contrary, the production of other crops decreased noticeably. It has been projected that the population growth rate be reduced to 1% by 2010, in order to maintain 216 million by 2060 from 141 million at present. That points to the fact that Bangladesh will have a shift in population density from 980 persons/ km^2 at present to 1500 persons/ km^2, and to feed another extra 75 million in 50 years. Hopefully, the agricultural growth is maintaining its rate around 3%, over the population growth rate.

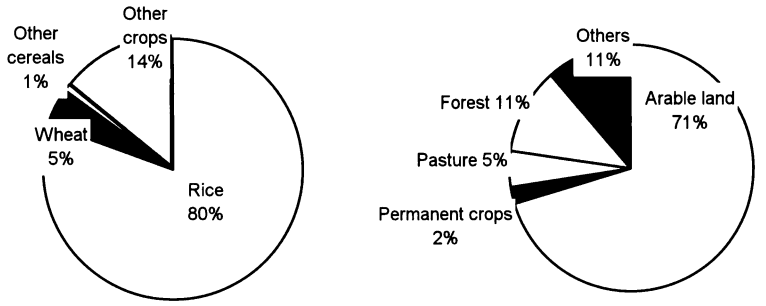
Recently, crop production is facing a serious challenge by different environmental factors, such as water stress, salinity, nutrient degradation, flooding and high temperatures, alongside with pest and diseases. It is anticipated that the problems would be more serious with the global climate change. Despite the development of high yielding varieties and improved management packages, potential crop production is hindered by those factors. To feed the increasing population, the country needs to pay main focus on the development of technologies that can combat those natural problems. Agricultural technologies developed under controlled conditions do not necessarily work under specific environmental conditions. The purpose of this paper is to discuss the problems encounter by Bangladesh agriculture (mainly crops) and their probable means of solution.

Crop Production Scenario

The country has a little more than 70 percent arable land, and almost 95% of the arable land is under cultivation (Fig. 1). Forest land (11%) is considered as one of the lowest in the world. Contrary, the cropping intensity is more than 185 percent, the highest in South Asia. Due to adoption of green revolution policy, farmers awareness for modern agriculture has raised appreciably. The use of fertilizers per hectare increased substantially from almost nil to about 160 kg (Fig. 2). The irrigation facilities also reached to almost 45% of the cultivated land of the country. Business related to fertilizers and import of irrigation implements, such as STW, has been privatized.

Rice occupies about 80% of the arable land, while the rest is used for growing almost all kinds of tropical and sub-tropical crops. Rice-rice-rice cropping system is very common. Rice cropping can be classified as irrigated, rainfed low land, upland and flood prone based on the rice ecosystems. However, local terms such as aus, amon and boro are commonly used for the rice grown during April-July, June-December and November–May, respectively. Average yield/ area varies greatly among the types of rice; almost 5 t/ha from irrigated rice to sometimes less than 1 t/ha from upland rainfed rice. Farmers grow HYV only when they have ensured irrigation facility. A relationship is found between the expansion of irrigation area

and rice production; thus, there is an ample scope for the yield improvement of rice just by increasing irrigation facilities.



Arable land use Land use pattern

Fig. 1. Arable land use and land use pattern in Bangladesh.

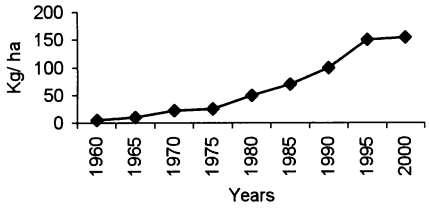


Fig. 2. Fertilizers use pattern.

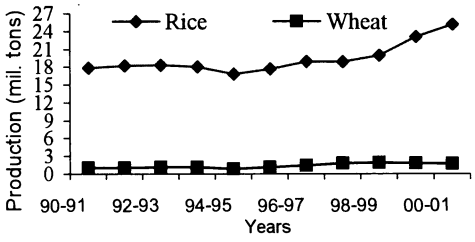


Fig. 3. Rice and wheat production pattern.

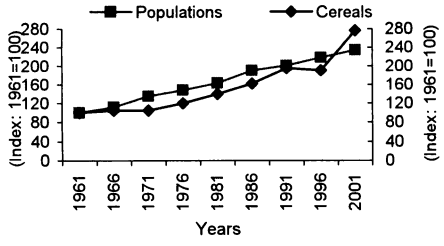


Fig. 4. Population vs. cereal production.

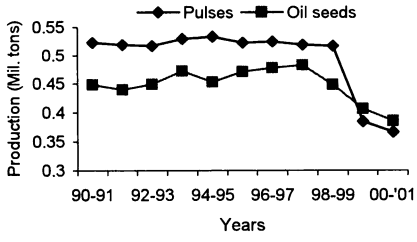


Fig. 5. Pulses and oilseeds production pattern.

During the last three decades both area and production of rice increased appreciably. Wheat area also increased during 1980s and still shows a slow increasing tendency (Fig. 3). As 95% arable land is already under cultivation, the more rice area means the more reduction in areas of other crops. There is a homeostasis situation in the area adjustment of rice and other crops. Recently, Bangladesh has achieved almost self sufficiency in cereal production. The production rate has surpassed the population growth rate (Fig. 4). However, the situation is vulnerable, as the country has a history of being affected by devastating flood, once in almost every 10 years or less, as well as by frequent drought during winter, both of which affect total production.

Another serious problem that threatens to sustainable agricultural production, is the decreasing of agricultural land due to rapid urbanization in the country. The economy is growing steadily on an average of 5 percent and the investment on industry and services is increasing fast. Consequently, agricultural land is decreasing at a rate 1% per annum. This should be looked seriously in order to ensure food security of the country. There is no effective enacted law that protects agricultural land, which exists in many countries.

Although the cereal production has increased, the area and production of pulses and oilseeds been decreasing considerably (Fig. 5). Vegetables production shows an increasing tendency, though fruit production remains static. The reasons behind the increase in vegetable production are the increasing demand for vegetables, development of high yielding varieties and technologies, and comparatively fair price as well. Contrary, except papaya, and some minor ones, fruits cultivation remains neglected and traditional. Recently a positive trend in mango cultivation is noticed, probably because of good marketing channel to the city from the garden.

Problems encounter and the strategic research

Environmental constraints, such as flooding/ waterlogging, drought, salinity and high temperature are the natural obstacles for achieving potential yield of the cultivated crops. Moreover, due to high cropping intensity (185%) and lack of enough attempt to improve the soils, nutrient status of the soil is declining at a considerable rate. As mentioned that there is almost no scope to bring new land under cultivation, but has ample scope to increase yield/ area, especially in those risk prone area. Sporadic researches are going on, but there is a lack of undertaking long term systematic study to develop crop technologies that fit for the stress affected area; mostly because of lacking of laboratory infrastructure, sufficient financial support and proper planning.

Flood is considered as a part of ecosystem in Bangladesh. Every year more than 25% land goes under water. Once in every 10 years or less, however, the country faces devastating flood. Usually the peak of flood is during August to mid-September. In some years, it happens that there is too much early rain, during June-July, which filled-up the water reservoir, such as rivers, lakes, ponds, etc. Under such situation, if the rains continue, there is little room to hold the excess water. Moreover, the water can not pass thoroughly to the Bay of Bengal, rather overflows, and in worse situation it causes the devastation. Sometimes, simultaneous over-melting of Himalayan snow worsen the situation. Summer rice (amon) is mainly affected seriously by the flood. Farmers in the low lying areas do not take risk of modern farming (high input farming), lest they lose everything. However, there is an enormous benefit from flood too, especially in relation to agricultural production. Every year floodwater carries about 2.5 billion tonnes of silt from upstream, which replenishes a part of soil fertility. Consequently, yield/ area increases in the following year of flooding, as noticed after the devastating floods in 1988 and 1998. In a study at the Bangabandhu Agricultural university, it was noticed that even flood sensitive *Vigna* shows high variability in genotypic food tolerance. The tolerant genotypes develop greater amount of new root mass than the

sensitive ones. Moreover, the tolerant one can recover quickly once the stress is over. Researches are going on at the Bangladesh Agricultural Research Institute to develop flood tolerant upland crops. However, there is no any registered flood tolerant variety of any crop yet, that points to intensify the work.

Though the total rainfall is more than 200 cm, it is erratic. Almost 95% rainfall occurs during monsoon summer. The winter, November to February, is dry and there is scanty of rainfall. Except rice and some vegetables, farmers grow most of the upland crops under rainfed conditions. Water stress on crop plants is, therefore, very common during winter and also during a long gap between two rains in summer even. Wheat and other winter crops are often suffer from drought. Drought shortens crop growth duration and causes low yield. Summer legumes, especially mungbean, also suffer from drought. Mungbean is usually grown in both early summer, February to April, and late summer, August to October. Both vegetative and reproductive growth of mungbean suffer from water shortage when grown in early summer, and mostly the reproductive growth when grown in late summer. A large genotypic difference in drought tolerance (Fig. 6) exists in mungbean, which could be of useful for crop improvement program under such conditions. Researches should be strengthen to develop drought tolerant wheat varieties as well as other upland crops.

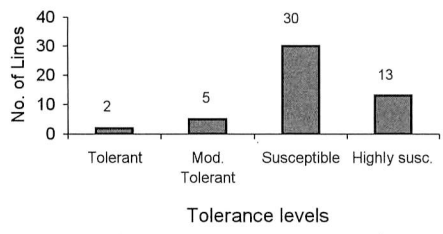


Fig. 6. Mungbean genotypes tolerant to water stress.

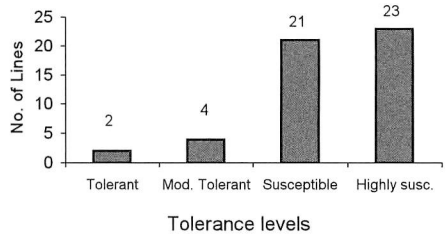


Fig. 7. Mungbean genotypes tolerant to salinity.

About three million hectares of land is affected by salt in the southern part of Bangladesh. The area is increasing due to intrusion of brackish water during dry season, when water level of the rivers goes down, seepage of sea water near the coast and rise of underground salty water to the surface. The nutrient status of the salt affected area is also poor. Interestingly, varietal differences in most of the crops exist. A large genotypic difference in salt tolerance was noticed in Mungbean in a study at the Bangabandhu Agricultural university (Fig. 7). The genotypic differences indicate the scope for yield improvement under such conditions. Further experiments are going on to develop salt tolerant variety and production packages as well under such conditions.

Being a subtropical country, Bangladesh experiences high temperature during summer. The temperature suddenly rises from the 2nd half of February, when wheat is at flowering stage. The temperature rises further to a level which is high enough to damage the reproductive growth. The yield reduction is mainly due to a less number of grains per plant as well as to smaller grain size for a reduction in grain filling period. Kanchan, a popular wheat

variety performs better under high temperature conditions compared to others. Fluctuated light intensity, from less than 100 $\mu molm^{-2}s^{-1}$ to a clear sunshine, during hot summer is another characteristic that influences on productivity. While low light down regulates the photosynthetic activity, high light inhibits fertilization under high temperature conditions, as observed in mungbean. Genotypic differences in high temperature tolerance were observed in maize, wheat and mungbean. However, almost no long term work is going on, mainly due to lack of controlled facilities and proper infrastructure. Experiments on Frenchbean under field conditions indicated a high variability among genotypes, when planted late (in December). Most of the 27 genotypes tested, at the Bangabandhu Agricultural University, failed to produce seeds, except 4/ or 5 which had quite appreciable number of seeds per pod. Frenchbean is highly sensitive to high temperature, while some genotypes might be productive under late planting conditions.

In addition to environmental problems, declining soil fertility causes serious yield reduction in all the crops grown. Because of high cropping intensity and lack of attempt to improve the soils, fertility status is declining disappointingly. Until 1950s farmers did not use chemical fertilizers, till 1980s used only NPK fertilizers, and now have to use S, Zn, B and Mo to harvest a good crop. Farmers use a very little compost or none. Most of the farmers had several cows for both milk or ploughing, just 20 years back, and now the number decreased to almost nil due to a reduction in farm size and lack of sufficient grazing land. The farmers use crop residues as fuel, thus return almost nothing to the soil.

Another major cause of low production is the yield gap between potential yield and actual yield in the farmers field. Results from demonstration trials of the Department of Agricultural Extension indicated that the yield gap of rice and legumes, between demonstration plots at the farmers field and farmers own cultivated plot, is almost 40 to 100% (Table 1). This gap should be reduced by strengthening linkage between farmers and Government officials of Research and Extension departments. Government support to the farmers, in terms of subsidy, is significantly low compared to other countries. Almost all the countries of the world, those have made a significant progress in agriculture, provide a lot of facilities to the farmers, including subsidy and tax exemption of agricultural land and commodities.

Conclusion

Since Bangladesh has little scope for increasing crop production by bringing more land under cultivation, it has to increase production/ area. In the next 50 years Bangladesh has to feed extra 70 million plus existing 141 million with the existing land, which is decreasing by 1% due to urbanization. To meet the challenge, the serious yield gap must be reduced significantly, technologies must be generated considering the specific environmental stresses threatening potential production and declining soil nutrient status, and finally government support should be broadened to ensure fair price of agricultural products.

Symposium

The 1st International Small Island Cultures Conference (7 - 10 Feb. 2005)

The international conference was held at a seminar hall of United Graduate School of Agriculture, Kagoshima University during the period of 7 - 10 Feb. 2005. There were 65 participants from 13 countries. After the welcome address delivered by Dr. Daniel Long, Tokyo Metropolitan University, 35 reports were presented in 8 themes; 1. Cultures and collaborators, 2. Island histories, 3. Issues in collaborative research, 4. Island dynamics,

5. Tourism and local cultures, 6. Regional location and identity, 7. Linguistic heritage and transition and 8. Cultures, heritages and identities.

Symposium on Future of Island Folk Songs

29 Oct. 2005

Seminar Hall, United Graduate School of Agriculture

After performance of folk songs by Mr. Yutaka Tuboyama, Mr. Eisho Kawamoto, Mr. Shigemitsu Izumi and Miss Saori Kawabata, several themes were discussed on folk songs of islands.

International Symposium on Global Warming and Pacific Islands

4 Feb. 2006

Inamori Hall, Kagoshima University

Chair; Moriwake, Hiroshi and Nagashima, Syunsuke (Kagoshima University)

Adapting to climate change in the Pacific Islands

Nunn, Patrick
Kagoshima University (The University of the South Pacific, Fiji)

Much of the response to past climate change and future climate change in the Pacific Islands has been driven by outside bodies that have agendas which are international but not necessarily applicable locally. There is an undue focus on the negative aspects of climate change in the Pacific that has created a widespread sense of helplessness amongst Pacific Island peoples. Much uncertainty in responding to climate change by Pacific Island decision-makers has also arisen because of the international view of climate change (or global warming) as a problem that is isolated from others. In the Pacific Islands, issues of environmental sustainability are intermeshed with those of climate change.

Much of the international assistance given to the Pacific Islands has been focused inappropriately, particularly on developing legislation to ensure environmental sustainability, and building national capacity to address climate-change issues. In reality, national legislation, particularly when it involves resource issues, is frequently ignored in the Pacific Islands. Also, building national capacity ignores the reality that in poor archipelagic nations most decisions about the local environment are made at community level, often without any input from government. In the future, more realistic assistance needs to be given to Pacific Island nations to help combat the challenges of climate change.

Problems and prospects for islands at the margins: a case study of Moturiki island, central Fiji

Kumar, Roselyn
The University of the South Pacific, Fiji

Outsiders sometimes fail to appreciate the complex geography of the Pacific Islands region when trying to understand the problems associated with global warming and their potential solutions. For this reason this presentation looks at an island on the margins rather than in the centre of a large island group in the Fiji Islands.

Moturiki Island is home to some 800 people living in 10 villages, mostly engaged in subsistence farming and fishing. Increasing population has strained the resource base of the island, and making the population less resilient and more dependent on outside assistance.

The physical fabric of the land of Moturiki is being slowly inundated by sea-level rise associated with global warming. Agriculture is being affected by rising temperatures. Decisions about adaptation in both current and proposed ヽ are being driven from the community level and are often inappropriate. In the foreseeable future it is likely that conditions on Moturiki will become far worse, with large areas of coastal lowland being flooded. Key uncertainties include future precipitation levels and changes in the frequency of typhoons (tropical cyclones). Moturiki is typical of hundreds of smaller, more marginal, inhabited Pacific Islands on which life may be more difficult to sustain in the future because of climate change.

Adaptation policy in the process of international negotiation on climate change

Kubota Izumi
National Institute of Environmental Studies

What's happening in Tuvalu -realties of the global warming

Jimbo Tetsuo
Video Journalist

Impacts in the land maintenance mechanisms of atolls induced by the climate changes and sea level rise -Field survey on Majuro Atokk, the Marshall Islands-

Yokoki Hiromune
Ibaraki University

Research Seminars

Research Seminar No.58 (14 Feb. 2005)
Automatic recording of the volcano and smoking in Nansei Islands and Philippine

Kinoshita Kisei
Kagoshima University

Research Seminar No.59 (18. April 2005)
Conservation of endangered animals and resurrection of extinct animals with reproductive biotechnologies

Ookutsu Shoji
Kagoshima University

Research Seminar No.60 (30 May 2005)
On the Recovery of the Remains of the Dead Soldiers after the Asia-Pacific War

Nishimura Akira
Kagoshima University Department of Law, Economics and Humanities

Chidorigafuchi Cemetery of the War Dead lies near Yasukuni Jinja shrine where often oomes up journalistically for Prime Minister Koizumi's visiting. This cemetery places a fraction of those ashes of the fallen soldiers under the Asia-Pacific War, which have not been identified or found takers. Those ashes were recovered from the battle fields by the Ministry of Health and Welfare and the gathering projects were undertook mostly three times and continued intermittently thereafter.

However, those projects or practices have scarcely been dealt with at all in the region of research of irei, the memorial for war dead in Japan since Yasukuni shrine and Chukonhi monuments have been main issues in relation to the constitutional separation of state and religion. It nowadays builds to understand the reality of the memorials by bereaved family and former soldiers in the region of regional history and folklore research and to have consensus on considering those diversities. This paper, on the basis of research direction as above, tries to understand the recovery practices of remains not only as a relief plan of the government but also as human agency of the living towards the dead in terms of anthropology of religion.

Research Seminar No.61 (27 June 2005)
Succession of Whale-carcass Communities

Yamamoto Tomoko
Faculty of Fisheries, Kagoshima University

When large mammalian carcasses sink to the bottom of the deep sea, decaying fat produces sulfides and methane gas, providing conditions needed for a chemosynthetic ecosystem relying on chemosynthetic bacteria as basic producers. There are two types of chemosynthetic communities: hydrothermal vent communities formed around hot vents at plate formation regions or submarine volcanoes, and cold-seep communities formed where plates collide and cold interstitial water seeps out due to compression. The benthic animals belonging specifically to chemosynthetic ecosystems, typified by Lamellibrachia satsuma in Kagoshima Bay, have evolved to obtain necessary nutrients by forming symbiotic relationships with chemosynthetic bacteria inside their bodies. Whale-carcass community depending on corps of whales is thought to be stepping stone of chemosynthetic communities. We monitored the whale-carcass community on which corps of 12 whales stranded on the coast of Oura,Kagoshima on January 2002 to test the stepping stone hypothesis and quantify the structure of whale-carcass community.

Research Seminar No.62 (25 July 2005)
The State of Crop Production and Mungbean (*Vigna radiata L.*) Research in Bangladesh

Karim, Abdul M.
Research Center for the Pacific Islands, Kagoshima University, and Bangabandhu Agricultural University, Bangladesh

Bangladesh is an overpopulated country with about 900 persons/km^2. Because of its high population pressure, the country has to pay major focus on cereal production. Most of the cropping patterns are dominated by rice. More than 90 % of the arable land is brought under cultivation, and there is a little scope for increasing production horizontally (i.e. by bringing more land under cultivation). Recently, Bangladesh achieved self sufficiency in cereal production. Vegetables production trend is also positive for its ready market, high demand and availability of good variety, though fruits production remains static. Production of grain legumes (pulses) and oilseeds declined sharply, mostly for decreasing of cultivation area.

Pulses play an important role for supplying vegetable protein to the common people. Pulse soup in everyday meal and snacks of various kinds are very popular. To meet the demand, the country has to import more than 50% of its requirement for pulses, spending

hard currency. There are many species of pulses in Bangladesh, broadly- (i) winter pulse, e.g. grasspea, chickpea, lentil, garden pea, Frenchbean, cowpea, etc. and (ii) summer pulse, eg. mungbean and blackgram. As a summer pulse, mungbean is considered as one of the most popular pulses for its high palatability and wider uses. The growth period of mungbean is short (~ 60 days) and it can be grown in both early (kharif I) and late summer (kharif II). Mungbean is also grown in between winter crops and summer rice (amon rice) to minimize competition with cereals. Moreover, mungbean can be grown successfully with maize and sugarcane, as intercropping, with a minimum competition with those main crops. Despite numerous advantages, mungbean production is decreasing. This is mainly because, with the expansion of irrigation facilities, rice area has been increased in good soils, and other crops including mungbean are pushing to marginal lands. Moreover, as a tropical crop, mungbean faces many biotic and abiotic stresses during its growth. The major stresses are low nutrient status of the soil, water stress, waterlogging, salinity and mungbean yellow mosaic virus (MYMV). Strategic researches are going on with partner organizations to develop MYMV resistant short duration varieties that perform well under specific environmental conditions. There is a collection of about 1000 genotypes to accomplish the job. Recently government has also taken a step to popularize crop diversification program. It is presumed that with the adoption of crop diversification policy and the development of problem specific technology, the area and production of pulses will increase in near future.

Research Seminar No.63 (12 Sept. 2005)
Outlines of lifestyle-related diseases in Amami Island regions and its preventive activities

Takezaki Toshiro
Graduate School of Medical and Dental Sciences, Kagoshima University

The proportion of people with long life in Amami Island regions is relatively high, compared with those in Japan and Kagoshima Prefecture. On the other hand, the average life span in females of Amami is higher than those of Japan and Kagoshima, but lower in males. These facts mean Amami is a suitable region for longevity of aged people after the survival through host and environmental factors, while it is important for active society to keep good health condition of people in manhood. The death rate in manhood of Amami is increasing, especially in males, although current standardized death rates of lifestyle-related diseases in Amami is not high than those in Japan. Therefore, the prevention of lifestyle-related diseases has a higher priority in Amami. We are planning to conduct a molecular epidemiological study on lifestyle-related diseases in Amami, which provides Amami people fruitful information on disease prevention according to individual susceptibility, using environmental and SNPs host factors. Furthermore, Yoron, Wadomari and Setouchi Towns of Amami are conducting health promotion projects, using Thalasso-therapy, with intervention study to clarify its effects.

Research Seminar No.64 (17 Oct. 2005)
What is the Pacific Island countries?

Kobayashi Izumi
Osaka Gakuin University

There are more than 20 political units, including 12 independent island countries in the Pacific. The countries which have emerged in the Pacific are small, isolate and under

developed. So International society had showed few interest in the Pacific area an age ago. However, island countries have distinguished themselves as political actors by their united power to the world for the last two decades. The existence of them would also have been important to Japan as our neighbor countries which have common issues in the Pacific in recent years.

This time, a lecture will be given to understand about the Pacific island countries in terms of traditional social structure, current economic activities, circumstances of the nation building and regional politics.

Research Seminar No.65 (5 Dec. 2005)
Scrub Typhus in Japan and Southeast Asia

Takahashi Mamoru
Kawagoe High School

Scrub Typhus, better known as chigger-borne rickettsiosis, is an acute, febrile infectious disease caused by infection with *Orientia tsutsugamushi*. This disease, which is transmitted by the bite of infected larval chiggers, was first described in Japan in 1879 by Baelz and Kawakami (1879), and is primarily distributed in Southeast Asia and the southwestern Pacific regions. Between the early 1900's and 1964, many epidemics of human scrub typhus infection were recorded in Japan. Mean annual prevalence of the disease declined from 1965 to 1974, amounting to fewer than 20 new cases per year. However, between 1975 and 1984 the incidence of scrub typhus increased dramatically with outbreaks increasing to new record levels each year. This remarkable resurgence is suspected to be due to an increase in number of vector chigger colonies that carry *O. tsutsugamushi*. Whereas most stages in the life cycle of trombiculid mites are free-living, unfed larva is the only parasitic stage that feeds on humans and rodents. *O. tsutsugamushi* is considered to be transmitted vertically from infected female parents to the next generation via transovarian transmission. In the case of *O. tsutsugamushi*-positive testing in enlarged chiggers recovered from rodents, a small doubt always remains as to which *O. tsutsugamushi*-negative unfed larvae acquired rickettsiae while feeding on the rickettsemic field rodents. The chiggers then transmitted this infection transstadially to succeeding life stages, but not vertically to larvae in the following generation.

Recent Publications

South Pacific Studies Vol. 25 No. 2 (March 2005)

Terence Miro Laufa: Japan's Development Aid Effects on the Rural Transport Industry in PNG: Evidence from the Bereina-Malalaua Road

Razia Sultana Chowdhury, Md. Abdul Karim, M. Moynul Haque, Abdul Hamid and Tetsushi Hidaka: Effects of Enhanced Level of CO_2 on Photosynthesis, Nitrogen Content and Productivity of Mungbean (*Vigna radiata* L. Wilczek)

South Pacific Studies Vol. 26 No. 1 (November 2005)

Research Papers

Abida Nasreen, Ghulam Mustafa Cheema, Muhammad Ashfaq: Mortality of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) after exposure to some insecticides; laboratory studies

Abida Nasreen, Ghulam Mustafa Cheema and Muhammad Iqbal: Relative Toxicity of Different Fungicides Against Larvae of Green Lacewing, *Chrysoperla carnea* (Chrysopidae: Neuroptera)
Kawai Kei: Beach Litter in Amami Islands, Japan
Yukiko Inoue: Critical Thinking and Diversity Experiences: The Case of An American Pacific Island University
Materials
Morimoto Rie: Democracy: How Commoners Voted in 'Eua Island, the Kingdom of Tonga

Occasional Papers No. 41 (March 2005)
'Symbiosis' of Human Being and Nature in the South Pacific Islands. Kawai K. & Nishimura S., eds.

Occasional Papers No. 42 (March 2005)
The Progress Report of the 2002-2004 Survey of the Research Project 'Social Homeostasis of Small Islands in an Island-zone' Tsukahara J. and Nagashima S., eds.

KAGOSHIMA UNIVERSITY
RESEARCH CENTER FOR THE PACIFIC ISLANDS

APPOINTMENT AVAILABLE

VISITING RESEARCHER

The Research Center for the Pacific Islands aims to promote interdisciplinary studies on islands and islands zones in Oceania and its surroundings. The Center will host one visiting researcher with a distinguished record of publications on some aspect of regional studies of above-stated areas. Once selected, the candidate will be appointed as a visiting professor or associate professor and take the position for three months to one year.

The candidate should undertake, during the term of their appointment, collaborative research with the staff concerning one of the following themes;
Terrestrial environments,
Organisms and resources in marine environments,
Conditions of health, and
History and/or culture studies

As a rule, the applicant should hold a Ph.D. or M.D. degree.

An appointee can be granted a salary and research expenses equivalent to a corresponding staff member of Kagoshima University and round-trip traveling expenses as well as the right to use an office, equipment, library, and other facilities and services.

Detailed inquiries are always welcome and should be addressed to following;

Kagoshima University Research Center for the Pacific Islands
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