ISSN 0215-2711

PALAWIJA NEWS

The CGPRT Centre Newsletter

Volume 6, Number 3 September, 1989

ACCORD SIGNED — Mr. Seiji Shindo, left, Director of the UN-ESCAP CGPRT Centre, endorses an Administrative Agreement which calls for closer co-operation in research and development on CGPRT crops with the Indonesian Ministry of Agriculture and its research agencies. To Mr. Shindo's left is Mr. Nusyirwan Zen, Secretary General, Ministry of Agriculture.

CGPRT Centre Concludes a New Accord With the Government of Indonesia

The CGPRT Centre has marked a new milestone in its continued effort at promoting research and development of *palawija* crops in the Asia and Pacific region.

On August 5, 1989, the Centre concluded an administrative agreement with the Indonesian Ministry of Agriculture. The agreement was signed in Jakarta by Mr. Nursyirwan Zen, Secretary General of the Ministry of Agriculture and Mr. Seiji Shindo, Director of the CGPRT Centre.

"The Administrative Agreement," Mr. Shindo said in his remarks, "is another milestone in our continuing effort to improve production, marketing and trade of CGPRT crops in Indonesia, to increase the incomes and improve the living standard of the people."

By signing the agreement, Mr. Shindo further stated, "both parties have reaffirmed their collaborative efforts and reaffirm an ESCAP — Economic and Social Commission for Asia and the Pacific — resolution which spells out cooperative endeavours."

The Secretary General responded to express his pleasure about the activities carried out by the Centre since its inception in 1981. "These programs," he pointed out, "are in line with (Indonesian) government programs to increase production of food crops, especially *palawija* crops."

Mr. Nusyirwan said that the presence of the CGPRT Centre in Indonesia is "very important, particularly to the Ministry of Agriculture which assists the government in increasing production of *palawija* crops."

IN THIS ISSUE

As an ESCAP member, Mr. Zen pointed out, the Government of Indonesia provides routine funding to support the administrative activities of the Centre.

The Administrative Agreement was signed in a brief ceremony in the new Headquarters of the Ministry of Agriculture in south Jakarta.

CGPRT's involvements in Indonesia date back to 1981 when the Indonesian Government offered to host the regional institution. The Centre was established in 1982 following adoption of an ESCAP resolution which called for increased co-operation in the research and development of CGPRT crops in ESCAP member countries.

In 1983, the Government of Indonesia erected a building to house the Centre's activities. It is located in Bogor, 60 kilometers south of the Indonesian capital.

The Administrative Agreement calls on the Centre to work with the Central Research Institute for Food Crops (CRIF), its counterpart agency, which maintains offices in nearby buildings in Bogor. In addition to working with CRIF, the Centre also has co-operative ventures with other Indonesian research institutions for food crops such as the Centre for Agro-Economic Research and the Centre for Soil Research.

"For reasons of cost effectiveness," Mr.-Shindo added at the signing ceremony, "many research projects have been initiated and conducted in Indonesia. The main objectives may sometimes be methodological testings, but in many instances, the findings and implications of the studies, with certain modifications, are applicable to other developing countries in the region."

In addition to conducting researches on CGPRT crops, the Centre also publishes and distributes research findings to individuals and organizations not only in the Asia Pacific region but also in Europe, North and South America and Australia.

Opportunities for Grain Legumes in Nusa Tenggara Timur

By Simon Field *

Introduction

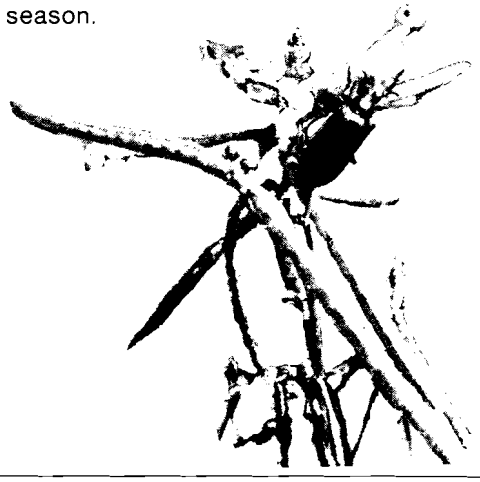
Farming in Nusa Tenggara Timur (the Lesser Sunda Islands) is principally subsistent and geared to producing sufficient corn and cassava during the wet season.

The islands, comprising Sumba, Flores, Alor and Timor, have an extended dry season, low rainfall (500-1500 mm/annual) and an occasional drought during the wet season. To a degree, its climate is influenced by its proximity to Australia.

Pigeon peas (*Cajanus cajan*) and cowpeas (*Vigna sp*) are the main grain legumes inter-cropped with maize, although peanut and mungbean are incorporated into some farming systems. Soybean is a relatively new crop with a small harvest area. Very few inputs are used because of insufficient cash, poor accessibility to distributors and insufficient information on alternative crops.

Pigeon peas

Pigeon peas are inter-cropped with maize and late maturing varieties (180 days) are favoured with approximately 10,000 plants/ha (depending on seed availability). Maize is harvested at 100-200 days and the pigeon pea crop continues to grow on residual soil moisture. It is either harvested as green pods or as dried peas, with low yields of approximately 250-500 kg/ha. No fertilizers are used, a wide variety of seed types are planted, and the crop is regarded as an opportunist crop. The local late maturing pigeon pea varieties are suited to the existing farming systems. Attempts to introduce early maturing pigeon peas failed, primarily because of pod borers (*Heliothis* and *Maruca*) and the blister beetle (*Mylabris pustulata*). Without proper insect control measures, early maturing pigeon peas produce no yield. The later maturing pigeon peas ripen well into the dry season when insect populations decline, thus avoiding peak insect infestation at the end of the wet season and early dry season.



* The writer is a farming systems agronomist on assisgnment to Nusa Tenggara Timur from the Agency for Agricultural Research and Development Nusa Tenggara Agricultural Support Project.

Editorial

Sustainable Development and Agricultural Research

Seiji Shindo,
Director
CGPRT Centre

Today, people talk a lot about sustainable development. The concept contains a wide range of meanings. In a narrow sense, it indicates the sustainability of a project after its termination. In fact, many development projects, both in technical and financial assistance, have failed to maintain their operations when external inputs were terminated. Their levels of activities were then substantially reduced or even ceased. In a wide sense, however, it implies that the development process should be sustainable, environmentally renewable, financially viable and technically acceptable. It is in this domain that sustainable development has been increasingly talked about.

In the area of agriculture, the concept of sustainable development could be interpreted into specific elements such as maintenance of production without imposing environmental strains, long-term economic viability of production systems and positive distribution to achieve equitable development.

Agricultural research and development should in this conjunction be regarded as instrumental in achieving sustainable development. In view of the long gestation period until the measurable effects of a research project are realized, research activities are not considered to be directly beneficial to development. Therefore, they are often subject to the first and hardest hit by austerity measures. The same situation has frequently occurred in activities which concern human resources development. Such actions are now increasingly seen as detrimental to sustainable development.

While acknowledging the benefits derived from research and development, it is equally true that agricultural research, including extension, should be organized efficiently with clear strategies and priorities. The longer time for maturity, generally required for research and development projects, should not be used as an excuse for their inefficiency.

Under the prevailing circumstances in many developing countries, I feel more emphasis should be placed on applied and adaptive research, so that basic technologies readily available at the international research stations or elsewhere could be applied for the direct benefits of the ultimate target people.

As a research and development institute emphasizing agro-economic and socio-economic aspects of specific crops, the Centre's research activities need to be looked into in light of the new developments. Sustainability should be a key issue in the Centre's programmes, particularly from the socio-economic and institutional points of view on which the Centre's activities are concentrated.

Mungbean

Mungbean is planted in the drier regions of NTT: Sabu, East Flores, Sikka and West Timor (Belu, TTS and TTU). Sabu is the driest area of NTT (annual rainfall, 500-900 mm), and mungbean is planted as a full wet season crop inter-cropped with 110-130 days sorghum varieties. Yields are approximately 500 kg/ha. The local early maturing variety (60 days) is well-suited to the calcareous soils of the island).

On East Flores and Sikka mungbean is relayed into the maize crop, 80 days after planting the maize (105-day variety). Maize is weeded at 70 days and mungbean is sown soon after. As the maize matures, the canopy unfolds to provide sufficient light for the emerging mungbean. After harvesting the maize, the stalks are cut and laid between the rows of mungbean as mulch. Mungbean is considered secondary to maize and any yield produced is a bonus. It is sold for cash or consumed as porridge. The local mungbean variety, which matures in 90 days, has a dull seed which is preferred for making mungbean porridge. Attempts to introduce early maturing mungbean (60 days) into the farming system have had mixed success. The crop matures in the dry season, thus avoiding insects and off-season storms, but is more susceptible to moisture stress. Droughts lasting three weeks are common at the end of the wet season. The longer maturing varieties are better suited to these conditions, accumulating more dry matter during the vegetative phase, and producing more flowers at the onset of flowering. An earlier maturing variety may experience a three-week drought immediately after planting and only produce a small number of leaves before flowering, thus restricting the potential planting sites.

However, if rains continue into March, the long maturing variety produces a large amount of biomass and subsequently lodges producing no yield. The early maturing varieties are better adapted to wetter environs and lose very few flowers and pods due to off-season storms at flowering and pod set. Observations over the last three years and farmers' experience with introduced early maturing varieties (No. 129), indicate that over several seasons, both varieties can be planted with a similar expectation to crop failure or success. Farmers may hedge their crop by planting both varieties. Insects, mainly pod suckers (*Riptortus linearis* and *Nezaria viridula*), are the main pests and chemical control has had limited success. Mungbean produces pods into the dry season, enabling the crop to avoid peak insect populations. In West Timor (Belu, TTS and TTU), mungbean is planted after maize in May when the southeast monsoon falls. Late maturing crops are planted, and problems experienced by farmers in East Flores and Sikka are similar to those in West Timor. Both early and late maturing varieties are suitable for the region.

Peanut

Peanut is usually planted as a full wet season crop. Kupang regency and Eastern Flores are the main peanut-producing areas of NTT. The crop competes with maize for land and is only grown when farmers have planted sufficient maize to satisfy requirements. For this reason, only farmers with larger areas (at least 0.5 ha per year) grow wet season peanut or, non-subsistence farmers who use the crop as income to purchase rice or maize.

Peanut is planted as a monocrop. A local 110-120 small seed Spanish *valencia* type is common. Yields are approximately 800 kg/ha with no inputs. The high cost of seed (Rp 1500/ kg) restricts the development of the peanut industry, also the seed often fails to germinate. Subsequently, farmers are apprehensive about investing scarce resources into purchasing seed, even though returns are high. Peanut has very few problems with insects compared to mungbean and pigeon peas. They mature underground and are protected from insects. Peanut strip virus is found in Flores and affects peanut yields. Currently this virus is not found in Timor. The calcareous soils of Timor often create iron and zinc deficiencies which in turn generate chlorosis of the young leaves. There appears to be no local variety suitable for planting on calcareous soils. Peanut production in Timor is mainly restricted to acidic soils. Experiments over the last six years have identified several Virginia bunch type peanut suited to the calcareous soils. The higher oil content of Virginia bunch, however, may exacerbate seed storage problems and may not be preferred for local consumption.

Peanut competes with maize because it is planted at the same time and inter-cropping only leads to the reduction in the yield of one crop. Farmers are mostly concerned with producing sufficient food supplies, and are apprehensive of reducing the maize crop and increasing the area for peanut. Only in areas where farmers are less dependent on maize for subsistence, or in areas where there is sufficient rainfall to allow farmers to plant peanut after maize, will peanut be readily adopted. Kupang regency is the main peanut-producing area as the soils are suitable, and proximity to the main provincial market enables farmers to sell their crop and purchase rice or maize.

Soybean

Soybean is a relatively new crop to the region with only 1000 ha planted per annum (*Dinas Pertanian*, 1988 pers. comm.). It is planted near the main regency towns where the local Javanese population require processed soybean. Soybean is not a part of the traditional diet here. It competes with maize for wet season cropping land. Farmers are more likely to plant peanut than soybean, if they don't plant maize. Many problems, such as pod-sucking insects, poor soil inoculation, poor seed quality and insufficient seed for planting, contribute to the low level of soybean farming. Attempts to plant soybean after rice in wet ricefields (*sawah*) areas, have met with limited success because of inadequate irrigation and the problems listed above. Programmes to increase soybean production in the area will have only a minor impact in the foreseeable future.

Conclusion

Grain legumes have an important role in the farming systems of NTT. Cropping systems need to be developed to ensure that the grain legumes complement the maize crop and do not compete for resources. In the subsistence farming system which predominate in NTT, farmers will ensure that the cereal crop produces sufficient food for the household before diverting resources to the grain legumes. As the economy develops, (areas in) NTT will become more cash crop oriented.

Workshop on Regional Statistical Data

WORKSHOP — Participants from six Southeast Asian countries pose for a memento with CGPRT Centre Director Seiji Shindo, seated second from right, and J.W. Taco Bottema, Programme Leader for IDS at the CGPRT Centre, left.

On 18-20 September 1989, the Centre organized, with financial assistance from the Dutch Government and the TCDC programme of ESCAP, a workshop addressing the problems of availability and accessibility of statistical data on non-rice food crops in the region.

It has long been recognized that lack of socio-economic data seriously hampered: research and project planning, agricultural planning as well as investments by the private sector.

Recognition of these problems has come from very different sides: It has been noted in farming system research and development sphere (IDRC/ACIAR, Khong Kaen, 1987) and it has been noted in the public investment sphere (ADB, Upland agriculture conference, 1989) and in numerous other conferences and meetings.

The workshop was attended by participants from Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam. The participants expressed their willingness and eagerness to participate in a regional statistical database system (RSDS) together with the Centre in a joint structure.

It was observed that a database which combines district level, time series production data, with time series data on prices, and data on demand and trade in general, would facilitate a vastly more efficient use of already existing data.

It was accepted that a programme had to be formulated in several stages. In the coming phase it was agreed that participants will look into further refinement of the software as developed by the Centre, and into possibilities to strengthen their data storage and analytical capacity. It was concluded that RSDS was primarily geared to increase accessibility of a wide variety of data for the convenience of users. As such it was felt that institutionally RSDS would be a fitting activity for national institutions engaged in data storage as well as research and studies to support planning and policy formulation. Too, international research and development organizations, and the private sector were identified as potential users.

The workshop resulted among others, into an improved list of profile indicators to serve as a guideline for the national participating institutions as well as in useful feedback to improve the existing software. Follow-up activities will be undertaken by a task force together with the Centre.

Cassava Goes Commercial*

New technology is allowing cassava growers to move from subsistence to commercial farming with a new range of dried cassava products.

Cassava — the staple diet of poor people in many parts of the world — is turning into a money-spinner for small farmers in Latin America who are exploiting higher-yielding varieties, improved production and preservation techniques and new marketing opportunities. *Yuca*, as it is known in Latin America, is grown by small farmers, usually in marginal soil. But developments are allowing many growers to move from subsistence to commercial farming and even conventional food producers and processors are becoming involved in industries making cassava products such as chips, starch and flour.

About 700 million people in the tropics eat cassava, whose hardy plant is able to withstand high temperatures and dehydration by regulating its transpiration rate and by recycling carbon dioxide.

Its food value lies in the carbohydrate content of the roots: 85% of the solid part of the root is starch. This also gives the plant considerable industrial potential.

Once they are harvested, cassava roots begin to spoil after two or three days, and in many parts of the world growers preserve them by sun-drying the milled roots.

The technology used by Thailand's cassava chipping and drying industry has been adapted for Latin American conditions by the Centro Internacional de Agricultura Tropical in Cali, Colombia.

In 1981 technology was introduced to cassava growers on Colombia's north coast, where farmers formed a 15-member association and set up a cassava-drying operation to sell to animal feed manufacturers as a substitute for energy-rich, imported grains such as sorghum. The drying scheme was so successful that other farmers' associations sprang up in the area: today there are nearly 50.

The substitution of cassava for wheat may help stem the drain of hard currency in many tropical, wheat-importing countries. Cassava flour, which can be made economically in slightly modified wheat mills, can replace up to 15% of the wheat flour used in bread, thus reducing imports. With products for which gluten is not so important, substitution can be much greater — a pasta factory in Cali replaces wheat flour with up to 50% of cassava flour.

The cassava-drying idea soon spread to Ecuador and Mexico. In Ecuador, cassava flour and starch is used in pellets fed to pond-raised shrimp, and cassava growers are expanding production to meet this booming market.

Cassava-drying and marketing associations provide threefold benefits: farmers have a job and income, feed manufacturers have a reliable and preferred raw material at a more predictable price, and governments save hard currency.

Because the cassava spoils so quickly, intermediaries in Latin America usually hike the price to cover their losses, forcing up prices in cities like Bogota or Lima to five times the producers price.

Ciat and the UK's Overseas Development and Natural Resources Institute have developed an inexpensive treatment to keep cassava fresh. The roots are put into a plastic bag to slow oxidation, then sprayed with a thiabendazole solution, a non-toxid fungicide, to retard microbial deterioration. The process keeps them fresh for two or three weeks, without refrigeration. The process costs less than US2 cent per kilogram.

Farmers using this method are now selling their cassava in big markets in Barranquilla and Bucaramanga, Colombia, and boosting their share of the value. The price gap (previously about US20 cent per kilogram) between what farmers used to make and what consumers have been paying is also shrinking.

In Manabi province, Ecuador, farmer associations are using this method to prepare cassava for airfreight to the US.

The packaging technology and cassava drying are giving growers new marketing options: they can sell the cassava fresh when the price is high, or sun-dry and sell it to feed manufacturers when it falls.

* *Reprinted from SOUTH, July 1989.*

Palawija News

is distributed free of charge to interested individuals and institutions. Please send address corrections and additions to:

Distribution Officer
Publication Section
CGPRT Centre
Jalan Merdeka 145
Bogor 16111
Indonesia

CGPRT Centre News and Activities

PN Conducts Readership Survey

A readership survey revealed that *Palawija News* has been well received by researchers and scientists in the Asia Pacific region.

While the response to the quarterly newsletter, published by the CGPRT Centre, has been favorable, readers suggested that it improve its contents and presentation and expand its readership and scope.

The survey was conducted early this year to seek ideas and suggestions from its more than 2,000 subscribers. Responses came not only from readers in the Asia Pacific region but also from those in Africa, Europe, North and South America.

"It is very informative and looks like an international publication," wrote M. Palomar, a subscriber in the Philippines. "Your newsletter is useful in providing comparative information on crops in the region," added A. Jalil of Malaysia.

S. Elias of Bangladesh recommended that *Palawija News* "include research findings from other countries" while T. Haseyama of Japan wrote to request that "more regional and Asia Pacific issues be promoted to upgrade the position of your (CGPRT) Centre."

A total of 3,163 questionnaires were mailed in February. *PN* received 841 responses.

"We are indeed appreciative of the responses from our readers," said Mr. Seiji Shindo, who became director of the CGPRT Centre in June of this year. "The returns showed the continuing need for information on CGPRT crops, and we look forward to meeting our readers' expectations," said Shindo.

"Indeed, *Palawija News* is an international publication. It is published as part of the Centre's varied activities to disseminate information on CGPRT crops," Mr. Shindo added.

"Therefore," he stated, "*Palawija News* is the most appropriate medium for researchers and scientists to let others know what they are doing or planning to do with respect to CGPRT crops."

Mr. Shindo urges readers to submit articles and photos which they wish to publish in *Palawija News*. "The success of our publication," he pointed out, "hinges on the contribution made by our readers. Their responses to the survey showed that they care about *Palawija News* and would like to see it as an information medium for those interested in CGPRT crops."

New Publications

The following new publications are available for purchase from the Distribution Officer, Publications Section, CGPRT Centre, Jalan Merdeka 145, Bogor 16111, Indonesia

Potato in Indonesia: Prospects for Medium Altitude Production.
J.W. Taco Bottema, Hoky Siregar, Sahat M. Pasaribu, Govert Gijsbers and Rofik S. Basuki (1989). 136 p. ISBN 979-8059-21-2 (Price to be determined).

This book studies the current farming and marketing conditions for medium altitude potato in Java and Sumatera. The report is a collaboration between various Indonesian Government Institutions and the CGPRT Centre. It analyses agronomic practices and includes case studies, yield performances, marketing systems, as well as examining the future potentials of the potato crop.

Forthcoming Publications

Demands for Corn, Cassava and Soybean in Human Consumption: Case Study of Java, Indonesia (1988). Bogor University of Agriculture - Team. Dr S.U. Kontjoro, Mr Kusnadi and Dr Sayogyo. ISBN 979-8059-22-0.

The role of three secondary crops is studied, with regard to consumption, incomes and prices, and the effects of commercialization. Case studies examine household consumer patterns, cropping and marketing systems, crop areas and yields, plus evaluation of protein/calorie intake. The impact of government policy on their supply, price and development is also dealt with.

A soybean-based Farming System in Upland Java–Palawija in a Village Economy. (1985-1987). Yoshinori Morooka, Henny Mayrowani, Rusmiati Yuyus, Rokayah Yayah and Sho Kosugi. ISBN 979-8059-23-9.

This study project investigates the cultivation of secondary food crops in an upland village of West Java. It deals with the inter-cropping systems, and the social/economic interplay of

such crops, especially soybean, on the structure of village life. The future direction of upland agriculture is also examined.

Study on Demand for Selected CGPRT Crops Commodities in East Asia. Masaru Kagatsume and Irland Soejono (1989). Kagatsume: National Research Institute for Agricultural Economics and Ministry of Agriculture, Forestry and Fisheries of Japan. Soejono: Supervisor and editor for the CGPRT Centre, Bogor. ISBN 979-8059-24-7.

An analysis is given of the import demand for selected CGPRT crops in Japan, South Korea, China, Taiwan and Hong Kong. The current and projected trends on production and import of these crops are presented, by examining population changes, income levels, diet, import structures and the domestic agricultural structure.

Bibliography on Soybean Research, 1978-1988. Documents Available in Indonesia (1989). Compiled by the CGPRT Centre and the Central Research Institute for Food Crops. ISBN 979-8059-25-5.

A comprehensive account of research projects and literature concerning soybean cultivation in Indonesia. A complete up-to-date listing of the various organizations involved, is also included.

Centre to Distribute CIAT Publications in Indonesia

Publications produced by the Centro Internacional De Agricultura Tropical (CIAT) in Colombia are now being distributed in Indonesia by the CGPRT Centre. The service allows individuals living in Indonesia to purchase CIAT publications more conveniently and at less cost due to lower postage rates. A price list is available from the Publication Section. The CGPRT Centre also distributes publications on behalf of IRRI and AVRDC. Other international agricultural organizations wishing to improve their distribution in Indonesia are invited to contact the Publication Section for more information.

Newly Available Publications from AVRDC and IRRI

The following AVRDC and IRRI publications are also available for purchase in Indonesia from the Publications Section, CGPRT Centre, Jalan Merdeka 145, Bogor 16111.

Vegetable Research in Southeast Asia Bruce T. McLean.
Policymakers and directors of research evaluate the current status of vegetable production in Indonesia, Malaysia, the Philippines and Thailand and outline future goals. Papers are presented also on the successful vegetable industries of Taiwan and Korea, AVRDC's achievements and potential role, the seed industry, agricultural research networks, the export market potential and designing agricultural research projects for external assistance. AVRDC 1988. 242 p. ISBN 92-9058-034-8. Rp 19.000.

Mungbean: Proceedings of the Second International Symposium S. Shanmugasundaram and Bruce T. McLean (eds.). Subject index: this state-of-the-art volume on mungbean includes the 83 papers presented at the Second International Symposium on Mungbean held in Bangkok, Thailand, in November 1987. Every aspect of this important food legume is discussed, i.e., taxonomy, genetic resources, breeding, plant protection, plant physiology, utilization and country reports. AVRDC 1988. 750 p. ISBN 92-9058-035-6. Rp 47.000.

Directory of Chinese Cabbage Researchers Jin-Young Yoon. AVRDC surveyed the international research community and obtained full background information on 333 researchers currently working on the crop. AVRDC 1988. 62 p. ISBN 92-9058-033-X. Rp 11.000.

Directory of Mungbean and Soybean Researchers S. Shanmugasundaram. AVRDC surveyed the international research community and obtained full background information on over 750 researchers currently working on mungbean and soybean. AVRDC 1989. 140 p. ISBN 92-9058-036-4. Rp 15.000.

Farmer's Primer on Growing Upland Rice M.A. Arraudeau and B.S. Vergara. A manual that tells *how to* and *why to* use improved production practices in growing upland rice. This book is part of a global strategy to train extension workers and help upland rice farmers. Students and scientists will also find the book useful. IRRI 1988. 284 p. ISBN 971-104-170-7. Rp 4.250.

CGPRT Centre

The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) was established in 1981 as a subsidiary body of UN/ESCAP.

Objectives

In co-operation with ESCAP member countries, the Centre will initiate and promote research, training and dissemination of information on socio-economic and related aspects of CGPRT crops in Asia and the Pacific. In its activities, the Centre aims to serve the needs of institutions concerned with planning, research, extension and development in relation to CGPRT crop production, marketing and use.

Programmes

In pursuit of its objectives, the Centre has three programmes which are mutually supportive:

1. Research, which entails the preparation and implementation of studies covering production, utilization and trade of CGPRT crops in the countries of Asia and the South Pacific:
2. Training of national research and extension workers:
3. Information and documentation which encompasses the collection, processing and dissemination of relevant information for use by researchers, policy makers, and extension workers.

Palawija News

Contributors are invited to submit concise summaries of significant social research related to CGPRT crops for publication. Submissions should be limited to two to four double-spaced typewritten text. Two figures (graphs or tables) may accompany each article. Include only references cited. All articles are subject to editing to meet space limitations.

Please send all queries relating to articles in *Palawija News* to: Head, Publication Section, CGPRT Centre, Jalan Merdeka 145, Bogor 16111, Indonesia.

Palawija News is distributed free of charge to interested individuals and institutions. Please send address corrections and additions to the Distribution Officer, Publication Section.

CGPRT CENTRE
Publications Section

Head:	Johannes S. Girsang
Editors:	Endah Murdiyarso John H. Owens
Production:	Deddy Subandi M. S. Tayanih (Yayan)
Distribution:	Taufik Angkasali
Printer:	SMT Grafika Desa Putera

CGPRT Centre
Jalan Merdeka 145,
Bogor 16111, Indonesia
Telephone: (0251) 26290
Telex: 48369 AARDMA IA
Cable: LITANAN Bogor

Palawija News
Volume 6, Number 3