



# APAARI

## NEWSLETTER



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### EDITORIAL

In the fast changing world agricultural scenario, National Agricultural Research Systems (NARS) in developing countries are confronted invariably with major issues such as: conservation of biodiversity, improved food security especially in the Low Income Food Deficit Countries (LIFDC), increased Household Nutrition Security, Sustainable Agriculture and Rural Development (SARD), Post-GATT agreement and globalization of agriculture, and above all the Agricultural Human Resource Development (AHRD). Many developing nations in the Asia-Pacific Region are addressing these issues in all earnest. Strategies and national policies are also being put into operation in order to have effective remedial measures before it is too late.

In the process, it is becoming evidently clear that no individual NARS has the capability to deal with most of the new emerging challenges independently. Even vision of NARS towards well-established centres is changing and issues such as partnership role and devolution are being pursued vigorously. Also it is being convincingly felt that through Technical Co-operation among Developing Countries (TCDC), NARS could build their capabilities more effectively for technology generation, assessment and transfer. Unfortunately, many NARS in the different regions have not been able to yet devise suitable mechanisms/network through which they could derive benefits from the strengths of one another. Hence, mechanisms to foster closer linkages using the concept of TCDC are required to be put into place. Initiative taken by the majority of the countries to establish the Asia-Pacific Association of Agricultural Research Institutions (APAARI) is indeed very timely. Already APAARI has started making its impact in the region. It has organized two regional consultations on: i) Technology Assessment and Transfer, and ii) Future Challenges and Opportunities for Enhanced Productivity and Sustainability. With the implementation of its Perspective Plan, APAARI is expected to emerge as a vibrant institution in the region. To have this realized, active co-operation of all concerned is solicited.

### EDITORIAL COMMITTEE

- |                  |                     |
|------------------|---------------------|
| • R.S. Paroda    | • R.B. Singh        |
| • William D. Dar | • Narong Chomchalow |

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**Editors**

# THIRD GENERAL ASSEMBLY OF APAARI

## ADDRESSES ISSUES ON PRODUCTIVITY AND FOOD SECURITY IN ASIA-PACIFIC

**P**overty, hunger, and malnutrition continue to haunt hundreds of millions of people in the world. But there is great hope for the Asia-Pacific region. In an expert consultation and 3rd General Assembly of the Asia-Pacific Association of Agricultural Research Institutions (APAARI), future challenges and opportunities for sustained and enhanced productivity and food security in the Asia-Pacific were addressed. The consultation meeting was held on 22-25 November 1994 at the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD). It was attended by 16 experts from 14 countries and representatives from the Asian Institute of Technology (AIT), the Asian Vegetable Research and Development Center (AVRDC), International Maize and Wheat Improvement Center (CIMMYT), International Rice Research Institute (IRRI), International Service for National Agricultural Research (ISNAR), International Crops Research Institute for the Semi-arid Tropics (ICRISAT), International Fund for Agricultural Development (IFAD), and the Food and Agriculture Organization (FAO).

Continuing population growth and widespread degradation of farm lands exert relentless pressure on the region's precarious food supply. Hence, the consultation meeting reviewed issues on how the national agricultural research systems (NARS) and the international agricultural research centers and services (IARCS) are to be linked together by mutual cooperation and respect to address these immediate concerns. Specifically, the meeting examined strategies and options, promoted understanding of the vision of national and international systems on research and technology development, and evolved new approaches for technology assessment and transfer, all geared towards enhanced agricultural productivity and food security.

### STRATEGIES FOR SUSTAINABLE AGRICULTURE

During the consultation meeting, the FAO expressed satisfaction on the role of the NARS and IARCs in doubling the rice and wheat production for the past 30 years. Ironically, this production record has not resolved the continuing malnutrition in the Asia-Pacific region. Aggravating the problem is the fact that agricultural intensification has caused salinization, water logging, and loss of biodiversity.

The efforts to increase food production have disrupted the farming systems and crop and animal production. Scientists are faced with greater challenges of meeting the man's basic food needs without jeopardizing the environment.

Since, over 60% of the world's population live in Asia, there is a need to increase crop yield by 40% for the next 20 years to maintain the current level of food availability.

Issues such as soil degradation, widespread deforestation, poor soil water management, and over-exploitation of ground water were raised. To minimize these problems, shallow ploughing, minimum tillage, mulching, addition of

organic matter, appropriate soil management practices, and privatization of irrigation as solutions were suggested.

Conservation of biodiversity and stable farming systems including animal husbandry are required for sustainability. Cautious utilization of agrochemicals with integrated plant-health management systems are also required to reduce the cost of production.

There is a need for the IARCs to address issues relating to sustainable production, government support, social and economic problems of farmers, and conscious efforts to reduce population growth and changes in food habits. Specific issues that should be prioritized include moisture conservation in drylands, restoration of soil fertility in degraded lands, and improved water use in irrigated lands.

Future strategies for agricultural development, infrastructure, linkages, and industrial development were outlined during the consultation meeting to address concerns in food security and productivity as well as to facilitate the development process in the Asia-Pacific region. These include the adoption of a national agricultural policy, increased support for research and development (R & D) institutions, and perspective planning, among others.

### OPTIONS FOR ENSURING FOOD SECURITY

The consultation meeting noted an estimated malnutrition deficiency of over 250 million tons of cereals by 2025. Hence, the need for accelerated growth in food production and technology utilization was stressed.

Improved technology has increased crop yields resulting in a 4% growth in agricultural production in the region. This also holds true in aquaculture. However, there still exists a deviation in yields of research trials and actual farming. With this problem, the need for appropriate technology and proper use of inputs and management of resources were given emphasis to meet the future demands in food supply.

New paradigms in technology transfer were also outlined which include systems and participatory approaches to technology transfer, and compatibility between productivity and sustainability, among others. Policies which include the establishment of science-based and efficiently-managed agriculture, rational exploitation of both well-endowed and poorly-endowed areas, and linkages for technology transfer were identified. Strengthening of information systems and international partnerships was also emphasized.

During the meeting, the NARS' importance as active players and partners in the renewal of Consultative Group on International Agricultural Research (CGIAR) initiative was highlighted. They should be able to respond creatively and effectively to the global policy on environment, information development, breakthroughs in biotechnology, and the growing problems of hunger and poverty.

Reformulation of research programs based on



*Participants attending APAARI Consultation at PCARRD*

ecosystem, farming systems for sustainable livelihood and security of the resource-poor people, provision of post-harvest technology, developing alternative resource use and management systems should be considered. Likewise, new linkages and instilling new vision among scientists should be forged to shift the approach from “what the discipline can offer to the system” to “what the system needs from the disciplines.”

### **HYBRID RICE NETWORK**

During a visit to the International Rice Research Institute (IRRI), which is a few kilometres away from PCARRD in Los Baños, Laguna, Philippines, IRRI reported that the increased production in rice was achieved through the hybrid rice technology (HRT). While countries like India, Philippines, and Vietnam have accepted HRT, other countries have lagged behind.

The promotion of the adoption of the HRT is a timely opportunity for the IARCS, NARS, and FAO to work together to improve rice production in the Asia-Pacific region. IRRI

will do the research and FAO will cover the development aspect. With this, an International Task Force on Hybrid Rice (ITFOHR) was proposed to facilitate work on HRT. The first meeting of the task force will be held in India. The need to sensitize researchers and examine the issues involving seed production and the formation of a network was also stressed.

As a result, all the countries that were present endorsed the HRT and pledged support for the establishment of the ITFOHR. The terms of reference of the task force are:

- (a) to expedite development and utilization of HRT; and
- (b) to strengthen basic research on hybrid rice.

The ITFOHR will get support from FAO, IRRI, APAARI and the NARS. Coordinating visits at IRRI would also be established for the task force.

ITFOHR envisions to address issues on the cost of hybrid seed, fertilizer, production, extension constraints, grain quality, patents, and modalities of providing parent lines to supporting countries.

### **PARTICIPATORY R & D AGENDA**

A partnership between the NARS and IARCS should be established. The NARS and the private sector should be provided with opportunities to participate in developing IARCS' strategic and long-term plans. At the same time, NARS should give IARCS the opportunity to participate in developing national research plans. These undertakings should be based on mutual objectives, respect and confidence, complementary and interdependence, resource sharing, consultation, and improved communication.

The involvement of farmers is needed in the conduct of research and technology. However, to do this, simplified technology packages



*Chairman, APAARI presenting plaque to Dr. M.S. Zehni*



# THE THIRD GENERAL ASSEMBLY MEETING OF THE ASIA-PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS

25 NOVEMBER 1994



Signing of bilateral agreements between PCARRD and ICAR and between PCARRD and ICRISAT

for both men and women of farming communities should be done.

Participatory identification of constraints and research problems would be beneficial. This will provide demand-driven research agenda with more readily adaptable solutions, as well as help communities to identify and test alternative strategies for sustainable agriculture.

## ACTION PLANS

The assembly served as a venue to present the perspective plan of the Association. As reported by Dr. William D. Dar of the Philippines, APAARI has agreed to establish a regional association of agricultural research institutions mainly to foster the development of agricultural research in the Asia-Pacific region. Specifically, this regional association will seek to:

- promote the exchange of scientific and technical know-how and information in agriculture;
- encourage the establishment of appropriate co-operative research and training program in accordance with identified regional, bilateral, or national needs and priorities;
- assist in the strengthening of research organizational and management capability of member-institutions; and
- strengthen cross-linkage among national, regional, and international research centers and organizations, including universities, through involvement in jointly-planned research and training programs.

To achieve the above mentioned plans, strategies and action plans were identified. These are:

- Regional collaboration/networks on priority programs.** It is a must that regional programs are in relation with the national initiatives being pursued by the member-countries. The following should be implemented:
  - selection and support of priority program areas through networking arrangements that offer the greatest impact and benefit to the region;
  - establishment of criteria for prioritizing program areas; and

- identification of centres of excellence.

- Information networking of centers of excellence.** Access to international networks and databases is necessary to meet the demands of the fast moving R & D technology-intensive business area. Thus, databases, and other regional and international networks such as BITNET and INTERNET should be established.

- Human resource development.** The association will have to strengthen strategic human resource development which includes nurturing of promising researchers, scientists, and research managers. Specifically it has to:
  - synthesize NARS to strengthen their efforts towards better human resource

development; and

- establish an APAARI fellowship program.

- Policy advocacy.** Mechanisms to communicate issues concerning the advancement of agriculture and natural resources sectors have to be developed. Thus, policy papers and publication lines need to be created.
- Promotion of technology transfer.** Technology promotion can be done by producing newsletters, conducting workshops and seminars and writing of success stories. The multimedia approach will be used for this strategy.
- Resource generation.** This can be done by setting mechanisms in strategy 1, guided by the networking of centres of excellence as stated in strategy 2. This will make each member-country aware of the ongoing R & D activities to avoid duplication and waste of resources. As such, simulation of interest from non-traditional loans should also be attempted to establish institutional tie-ups with these donors.
- Publication enhancement.** Publication programs will be pursued to document important events and research findings through success stories, newsletters, and research management studies.

During the general assembly, officers of the executive committee for 1994-95 were elected. They are:

Chairman:	Dr. William D. Dar (Philippines)
Vice-Chairman:	Mr. Abbas Keshawarz (Iran)
Members:	Dr. S.T. Semisi (Western Samoa) Dr. Young Sang Kim (Korea) Dr. Md. Sharif bin Ahmad (Malaysia) Dr. Shiva Bahadur Nepali (Nepal)

Executive Secretary: Dr. R.S. Paroda

The Fourth General Assembly will be held in Iran in 1996.

# INTERNATIONAL CONFERENCE AND PROGRAMME FOR PLANT GENETIC RESOURCES

The conservation and sustainable utilization of plant genetic resources for food and agriculture are activities which are essential for increasing food production and ensuring food security. In furtherance of these objectives, FAO will convene the Fourth International Technical Conference for Plant Genetic Resources in Germany in June 1996 to consider a number of proposals to safeguard and ensure benefit from these resources. To coordinate preparations for the Conference, FAO has now established a multi-donor trust fund project - the International Conference and Programme for Plant Genetic Resources (ICPPGR) - based at the Headquarters.

During the preparatory process for the Conference, the ICPPGR will develop a concrete, costed Global Plan of Action for plant genetic resources through a participatory and country-driven process with guidance from the Commission on Plant Genetic Resources (CPGR). The plan will be based on FAO's first Report on the State of the World's Plant Genetic Resources, prepared by the project. Country Reports, requested from each country, will provide the foundation for both documents. The International Conference will formally consider the adoption of the Global Plan of Action.

Together with the International Undertaking on Plant Genetic Resources now being revised by the governments through the CPGR, the Global Plan of Action will be a major component of FAO's response to and furtherance of the Convention on Biological Diversity.

In the above context, the Assistant Director-General, Agriculture Department has been entrusted with the responsibility to oversee the preparation for the Conference, to coordinate the contributions from the other Departments concerned and the Legal Office, as well as to ensure liaison with the International Plant Genetic Resources Institute (IPGRI). In this capacity, the Assistant Director-General, Agriculture Department may call *ad hoc* coordination meetings with other Departments and invite IPGRI to such meetings.

In addition, a Project Task Force has been established for the ICPPGR and an external expert group is foreseen. Mr.

## THE CHALLENGE

The future of each nation and of humanity as a whole depends on how the present generation takes up the challenges of developing policies and actions for sustainable food production.

Providing food for the future is an international concern and a multidisciplinary challenge. Soil conservation, pest control, planting and harvesting techniques, irrigation and post-harvest storage are all significant facets of the problem and will be important contributors to the solution. International trade and economic policies are also relevant. So too are genetic resources, the naturally occurring raw materials of crops, forest and livestock improvement including the remnants of traditional varieties that have survived the modernization of agriculture and the modern, highly adapted lines with a carefully selected but inevitably narrow genetic base.

Genetic resources are perhaps the most valuable and strategically important assets that your country hold. While few countries can claim to harbour in their fields the wild progenitors of major food, fibre or timber species, many more have indigenous crops that could potentially meet much wider needs than they do at present. Moreover, scientific advances in breeding and genetic engineering techniques are opening the way for very distant relatives or totally unrelated species to contribute to the genetic improvement of economically important plants.

FAO, as the United Nations agency central to ensuring food for the future, is planning a major international conference on plant genetic resources in the northern summer of 1996. It will be the fourth technical conference sponsored by FAO on this subject and the first for more than a decade. During that time it has become much clearer that the problems of conservation and sustainable use of genetic resources will not be resolved at the technical level alone. The forthcoming Conference, and the whole process leading up to it, will address the need for not only technical advances but also national and international policies, plans and values to be factored in to the equation.

M.C. Fowler has been appointed Project Manager to lead the ICPPGR Secretariat.

It is recalled that the FAO Conference had stressed the importance of this project and endorsed its aims and strategy. Recognizing that this is a time-constrained, country-driven process, the co-operation of all, both at Headquarters and in the field, is sought in order to make this endeavour a success.

## BRIEF DESCRIPTION

Plant genetic resources are the foundation of agriculture and forestry. Threats to the security of these resources are growing and genetic diversity is being lost from farmer's fields, forest ecosystems as well as in genebanks.

To safeguard the world's plant genetic resources it is essential to link conservation efforts to sustainable utilization programmes to meet the ever changing needs of human kind. Special emphasis should be placed on the building or strengthening of endogenous capacity, structures and programmes for rational conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture (PGRFA) at national and regional levels.

In its initial stage, the project will support a country driven process to assess the situation of PGRFA, including forestry resources, and to identify national and sub-regional activities for *ex situ* and *in situ* conservation and utilization of plant genetic resources. The national assessment reports will identify problems and set priorities. Where feasible, these reports will be discussed and synthesized at sub-regional meetings. Costed programmes will be developed to **interalia** strengthen institutional capacity and structures

including human resources development. The national reports, complemented as necessary with sub-regional assessments and analysis of selected cross-cutting issues will provide essential inputs for the first Report on the State of the World's Plant Genetic Resources (SW/PGR).

The Project will use the draft SW/PGR and other relevant material to prepare the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources (GPA/PGR).

## REGIONAL EXPERT CONSULTATIONS

### EXPERT CONSULTATION OF THE REGIONAL NETWORK ON VEGETABLE CROPS

**E**xpert consultation of regional network on vegetable crops was held at FAO, RAPA, Bangkok, Thailand from 29 November to 2 December, 1994. Experts from 17 countries, Bangladesh, China, Fiji, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand, Vietnam and West Samoa besides representatives from AVRDC, APSA and FAO and Seed Companies participated in the consultation.

The consultation emphasized the importance of vegetable crops in human diet in the region and felt that the availability of vegetables in the human diet is much less than the requirement. The consultation felt the need of  $F_1$  hybrid technology in increasing the productivity of vegetable crops. Already a number of hybrid varieties have been developed in solanaceous vegetables, crucifers and cucurbits especially in Japan, Korea, China and India. However many countries have yet to go a long way in generating and utilizing the hybrid technology in vegetable crops.

#### OBJECTIVES

- i) To assess the current situation of vegetable production, productivity and availability in the region.
- ii) To collect and disseminate information on research and development of vegetable production and improvement with special reference to hybrid technology in major vegetable crops.
- iii) To assess the role of hybrid varieties in increasing the productivity of vegetable crops in the region.
- iv) To analyse the status of hybrid seed production in the Asia-Pacific region.
- v) To strengthen the national research capabilities and linkages in different countries of the region for developing and promoting hybrid technology.
- vi) To discuss the need for regional and international collaboration for promoting the vegetable hybrids.

$F_1$  hybrid technology has been well recognized in tomato, pepper, cabbage, and cucumber and in these crops very large number of  $F_1$  hybrids have been developed. However, it was realized that there is a need to incorporate biotic and abiotic stress resistance in  $F_1$  hybrids considering the severity of such stresses. Consultation emphasized the significance of male sterility, self-incompatibility gynocism and use of chemicals for development of hybrids and economic hybrid seed production.

Although in the discussion the scarcity of  $F_1$  hybrid seeds was felt and most of the countries do not produce adequate quantity of hybrid seed for their requirement which is the major constraint to the utilization of hybrid technology. It was also realized that the countries do not

have the strong infrastructure to develop hybrid technology and to produce hybrid seeds. The consultation realized the constraints of the limited support of the Government for the development of hybrid technology and hybrid seed production in vegetable. There is a strong need for the training of personnel for hybrid seed production.

The role of private sector to promote hybrid seed industry in the region was felt to be significant. The region has tremendous capabilities in terms of human resources and technological manpower which could be capitalized for collaborative approach for generating scientific knowledge in technology and production of high quality seeds.

There is a need of testing facilities for hybrid varieties available in public and private sector to help in greater productivity. Policy issues are needed to address matters relating to production, distribution and marketing of  $F_1$  hybrid seed, PVR system, impact of hybrid technology on socio-economic aspects and seed law enforcement.

#### RECOMMENDATIONS

- i) The Consultation felt the significance of nutrition in vegetable crops in human diet. However, there is no authentic published information regarding nutritional status of vegetable crops, thus the Consultation recommended to bring out a publication on the nutritional status of vegetable crops in the region, in collaboration with the Nutrition Division of FAO-RAPA.
- ii) The Consultation recommended for the establishment of a regional vegetable improvement project with special emphasis on vegetable hybrid seed production. Both public and private sectors may be involved in this activity.
- iii) The Consultation felt that each government should analyse the benefits of hybrid seed technology and if it decides to proceed it should strengthen the R & D on and promotion of  $F_1$  hybrid vegetable seed technology. It is worthwhile to identify a lead centre to take up the basic problems encountered in the programme. Both private and public sectors be involved in the hybrid technology.
- iv) The Consultation has realized the significance of protection of researchers to be right for the development of new OP variety and  $F_1$  hybrids. In this connection, the Consultation recommended that the countries should adopt a *sui generis* system of plant variety protection based on the UPOV (1978) Convention.
- v) Seed was considered the most important input in vegetable production and thus its quality should be maintained. In this connection, the Consultation rec-



ommended that each country should adopt a system of seed legislation to regulate the seed quality. This will ensure and maintain the quality of the seeds.

- vi) Crop prioritization and identification of areas for research and development should be done. Each member country is encouraged to prioritize crops as well as areas for research and development. In addition, identification of areas for collaboration among countries should be done.
- vii) Strengthening the capabilities of  $F_1$  hybrid development through conventional and biotechnological techniques. This can be accomplished through regional training programmes and post-graduate studies.
- viii) Establishment of Consultation Forum for Vegetables in Asia and Pacific (CFVAP) with the object: (a) to provide overall guidelines for research and development of vegetables; (b) to work as a facilitator for R & D on vegetables crops; (c) to improve linkages and co-operation among the member countries; and (d) to



*Participants attending the Expert Consultation of the Regional Network on Vegetable Crops*

- ix) organize symposium/workshop in co-operation with FAO or other donor agencies.
- x) Regional coordinated trials on  $F_1$  hybrids are required to be initiated in order to realize the potentialities of hybrids at a greater extent in the region.
- x) Regional cooperation on germplasm exchange based on each country's need should be strengthened.

## REGIONAL EXPERT CONSULTATION ON NON-WOOD FOREST PRODUCTS

**M**ore than 70 specialists from Asia and the Pacific participated in a week-long consultation on the social, economic, and cultural aspects of non-wood forest products, 28 November - 2 December, 1994. With ever-increasing threats to the remaining tropical forests in the region, new approaches are being sought to use these forests without destroying them. Non-wood forest products are holding considerable potential for providing benefits to rural communities while maintaining the ecological integrity of forest ecosystems.

The consultation highlighted several successful or promising non-wood forest products initiatives including efforts to develop markets for forest nuts in the Solomon

Islands, preserves and jams made from forest fruits in the Philippines, ecotourism in Fiji, medicinal plants in India, Sri Lanka, and Indonesia, rattan in Malaysia, and others.

The consultation dealt extensively with the potential risks and benefits of commercializing non-wood forest products. Marketing and trade specialists provided advice to consultation participants on how to improve linkages between rural producers of non-wood forest products and consumers through efficient and viable market mechanisms. Similarly, legal specialists provided guidance on ways to protect people's rights of access to increasingly valuable non-wood forest resources.

### 8TH SESSION OF IPFC WORKING PARTY ON AQUACULTURE

The Eighth Session of the IPFC Working Party of Experts on Aquaculture was held from 19-25 October 1994 at Bangkok, Thailand to review the status of aquaculture development in the Asia-Pacific region, with special reference to its environmental implications. Special consideration was given to determine research/development needs and legislation/regulations required to maintain sustainability.

It was attended by 9 members of the Working Party (all senior scientists/policymakers), 5 FAO staff members (from FIRI and RAPA) and 4 observers from the Asian Institute of Technology, ASEAN/EEC Aquaculture Development and Co-ordination Programme and the Department of Fisheries.

The country papers reflected the trend of shifting from extensive to more intensive aquaculture techniques. It was agreed that attention has to be refocused to low-cost food fishes produced primarily in crop/livestock/fish farming systems appropriate for small-scale farmers. Genetic improvement of cultured stocks through breeding programmes and seed certification was recommended. Increasing intra- and inter-sectoral cooperation and coordination in aquaculture development was considered vital in achieving sustainability. As negative environmental impacts of aquaculture were considered to be results of uncontrolled/unregulated development, FAO assistance given for upgrading the relevant legislation/regulations was called for.

## WORLD FOOD DAY - 1994

**A**s in the past 13 years, World Food Day was observed all over the world to celebrate FAO's establishment on October 16. This year's celebration took place on October 17 at the FAO Regional Office for Asia and the Pacific in Bangkok.

Among the activities organized to mark the event was a competition for the "Y.S. Rao" Prize, given to outstanding farmers in Asia and the Pacific for their contributions

to agricultural and irrigation development as well as soil and water conservation. Other activities included a World Food Day photography contest, a student quiz, and an exhibition on Water for Life at the World Trade Center in Bangkok.

Her Royal Highness Princess Maha Chakri Sirindhorn graciously presided over the 1994 World Food Day Celebration. She presented awards to winners of the contests in various categories. This year's outstanding farmers are Mr. Smutr Dumdee from Surin Province in northeast Thailand



*Mrs. Pham Thi Vach of Vietnam receiving award from Her Royal Highness Princess Maha Chakri Sirindhorn*

for his contribution to integrated farming; Mr. Qumarz Zaman Shah of Pakistan for his contribution to water management and irrigation; and Mrs. Pham Thi Vach of Vietnam for her leading role in constructing weirs and embankments.

The World Food Day Celebration also featured a symposium on "Water for Life", the theme of World Food Day 1994, aimed at seeking measures to deal with the

## THEME: WATER FOR LIFE

water shortage problem. Water specialists speaking in the symposium were Dato Shahrizaila Bin Abdullah from Malaysia, Dr. M.S. Reddy from India, Mrs. Thelma R. Paris from the Philippines, and Dr. Apichart Anukularmchai from the Office of Environmental Policy and Planning, Thailand.

The symposium pointed out the wise use of water and the problems entailed by the improper use of this valuable resource. Attending the symposium were ministers, diplomats and officials at the national and international levels.

### DR. C.M. ANWAR KHAN TAKES OVER AS PARC CHAIRMAN

**D**r. C.M. Anwar Khan, a renowned scientist of the country, has taken over the charge of Chairman, Pakistan Agricultural Research Council (PARC) on September 25.

Dr. Anwar is no stranger to PARC as he had been its Chief Executive, one of the founder-Directors, Member, Plant Sciences and Member, Natural Resources and Director General, National Agricultural Research Centre (NARC). Besides PARC, he has held numerous important assignments such as Director General, Pakistan's Museum of Natural History, Adviser to the Federal Ministry of Finance for Agriculture Development Bank of Pakistan, etc.



*Dr. C.M. Anwar Khan  
Chairman, PARC*

Dr. Anwar has a brilliant academic record. He did his Ph.D/M.S. in Agriculture (Range Management) from Wyoming University, USA., creating world record with Outstanding Scholar Award 1968.

The Chairman is a widely travelled scientist as he had been to Iran, Turkey, China, Japan, Australia, U.K., Netherlands, North Korea, Nepal, Zimbabwe and Indonesia in connection with different assignments of national importance.

Dr. Anwar is a distinguished scholar, author and linguist. He has written numerous scientific and religious books. Besides, he has over 100 research articles to his credit, published in national as well as international journals of repute.



# AN INSTITUTE PROFILE

**P**akistan Agricultural Research Council (PARC) is the Apex research organization at the Federal level with the mandate to strengthen agricultural research system, both the federal and provincial components to focus attention on research problems which have to be resolved to promote the overall agricultural development in the country.

## I. FUNCTIONS

The functions of PARC, enumerated in its establishment Ordinance of 1981 are as follows:

- (a) To undertake, aid, promote and co-ordinate agricultural research;
- (b) to arrange expeditious utilization of research results;
- (c) to establish research establishments mainly to fill in the gaps in the existing programme of agricultural research;
- (d) to arrange the training of high level scientific manpower in agricultural sciences;
- (e) to generate, acquire and disseminate information relating to agriculture;
- (f) to establish and maintain a reference and research library; and
- (g) to perform any other functions related to the matters aforesaid.

## II. ORGANIZATIONAL SET-UP

PARC is headed by a Chairman and consists of five whole-time Members viz. Member Crop Sciences, Member Animal Sciences, Member Natural Resources, Member Social Sciences and Member Finance. There is a galaxy of competent scientists working at various research establishments of PARC. Administratively, PARC



*An exterior view of Pakistan Agricultural Research Council's (PARC) Head Office Building at Islamabad*

## PAKISTAN AGRICULTURAL RESEARCH COUNCIL



PAKISTAN

is attached to the Agricultural Research Wing of the Federal Ministry of Food, Agriculture and Livestock (MINFAL).

## III. PARC

### ESTABLISHMENTS

In accordance with its Charter, PARC has set up 7 major agricultural research institutions of its own, located in different parts of the country for conducting research in their respective agro-ecologies. These are:

- (a) National Agricultural Research Centre (NARC), Islamabad;
- (b) Arid Zone Research Institute, Quetta;
- (c) Tropical Agricultural Research Institute, Karachi;
- (d) Karakoram Agricultural Research Institute, Jaglot, Gilgit;
- (e) National Tea Research Station, Shinkiari, Mansehra;
- (f) Cereal Diseases Research Institute, Islamabad/Murree; and
- (g) Himalayan Agricultural Research Station, Kaghan.

National Agricultural Research Centre, Islamabad is multi-disciplinary in character and conducts research on all important aspects of agriculture to enhance its productivity. Here, besides well-managed field research areas, and green houses, there are a number of fully equipped laboratories

with sophisticated instruments to undertake high calibre research, both basic and applied, for the resolution of intricate agricultural problems. To carry out the research in a well-planned manner, various programmes and units at NARC are organized into 13 institutes on the campus. These include institutes on crops, horticulture, plant genetics, crop diseases, land resources, water resources, range-



*A front view of National Agricultural Research Centre (NARC), Islamabad*

land research, honeybee, animal sciences, farm machinery, sustainable agriculture and Social Sciences. Besides, a Training Institute also functions here, conducting national as well as international level training courses regularly to train the scientists, extension workers, farmers and so on.

#### **IV. RESEARCH HIGHLIGHTS**

A number of useful findings have been obtained as a result of research conducted by PARC scientists. Some of these are listed below:

##### **1. Plant Introduction**

A number of plant species such as coconut, oil palm, bidi leaf, bamboo, sapota, passion fruit, food legumes, strawberry, saffron, etc., imported from the USA, France, Italy, Brazil, Malaysia, Indonesia, Sri Lanka, China and a number of other countries are under trial at various PARC centres. As a result, a number of new crop plants have been introduced in the country.

##### **2. Crop Varieties Development**

The Council is playing a vital role in the development of high-yielding crop varieties as well as improved agronomic practices to enhance crop productivity. In this context, necessary support is being provided to the provincial agricultural institutions in terms of imported germplasm, research equipment, training, staff and operational funds. More importantly, the candidate varieties of major crops developed by plant breeders across the country are evaluated by PARC through National Uniform Yield Trials, conducted in different agro-ecological areas, before these are released to the farmers for general cultivation. The travelling seminars are another tool to promote the development of high-yielding varieties. In addition, PARC is heading a Variety Evaluation Committee (VEC) at the national level on different crops, mandated to consider proposals for varietal approval and their release to farmers.

##### **3. Tea Production**

The National Tea Research Station at Shinkdari has conducted successful studies on tea growing in the northern parts of Pakistan and is now engaged in disseminating tea production technology, including the selection of suitable varieties, standardization of agronomic practices and processing techniques to the prospective farmers. The large-scale production of tea is being stressed by PARC and, to promote its extension efforts, about 2 million plants of tea will be distributed among farmers to establish their tea gardens. Soil survey of the area, potentially suitable for tea growing, is also being carried out.

##### **4. Control of Viral Diseases**

The Council has always responded well at the time of national disease crisis in agriculture. To overcome the virus problem in banana, which appeared as a catastrophe and devastated banana plantations in large areas, seven cultivars of banana, free from bunchy top virus, were produced by PARC scientists through tissue culture, and plants were supplied to the prospective growers in a large number. The virus problem in chilli was also attended to well in time. PARC also effectively participated in the National level cam-

paign for the control of cotton leaf curl virus (CLCV) and its scientists carried out detailed surveys and conducted relevant studies to help develop suitable control measures in collaboration with the scientists of provincial and federal institutions.

##### **5. Honeybee Research**

PARC has recently expanded its activities on honey production. The number of honeybee colonies has increased to 35000 and about 1000 tonnes of honey is being produced. Under Productivity Enhancement Programme (PEP), honey produced at NARC as well as by renowned beekeepers is packed and sold by Honeybee Programme of NARC

##### **6. Fruits/Vegetables**

Four new varieties of apple, two of peach, two of grapes, suitable for hot and dry areas have been successfully tested/developed. Eight high-yielding varieties of loquat, four of tomato, four of chilli, two of pears and one variety each of onion and radish have been identified. Two varieties of citrus have also been identified, which would prolong the period of availability from 90 to 145 days during the season.

##### **7. Farm Machinery**

PARC experts have developed various agricultural machines and farm implements to expedite and economize different farm operations. These machines include pneumatic row-crop planter, sugarcane set-cutter, groundnut thresher, hold-on paddy thresher, oilseed thresher, etc. The Farm Machinery Institute (FMI) of PARC is continuously providing assistance to private sector for the fabrication of these machines locally. In 1993, FMI also arranged visits of private sector mechanics to China to acquaint them with the modern technology for use and production of new farm machines and implements.

##### **8. Water and Land**

The locally fabricated sprinkler irrigation system (raingun model PY 1.30) was successfully tested and necessary modifications were made to reduce its energy cost and make it affordable by small farmers. The locally manufactured components of trickle irrigation system were standardized to fabricate it in Pakistan. To promote plasticulture, a complete package of controlled environment irrigation and low-cost plastic tunnels is in the final stages of development. A low-cost water harvesting technique named eyebrow terrace has been developed to grow fruit and forest trees in rainfed areas. Similarly, application of iron was found helpful to increase the yield of groundnut and chickpea. To maintain soil health, particularly in catchment areas with high slopes, successful plant covers were identified to reduce runoff and erosion. In these studies, the catchment planted with *Leucaena leucocephala* practically produced no runoff.

##### **9. Livestock Production**

The research in this sub-sector is focussed on animal health, animal production, animal nutrition and fisheries and aquaculture. Modern techniques were employed to control livestock diseases. For the diagnosis of bovine

brucellosis, the relative diagnostic parameters of enzyme-linked immunosorbent assay (ELISA) and serum agglutination test (SAT) were compared. In cattle, 33.9% and 54.2% of serum samples were positive by SAT and ELISA whereas in buffaloes 12.9% and 38.3% were positive by SAT and ELISA, respectively. Such studies were also conducted on Bovid Herpes Virus-4 and Hemorrhagic septicaemia. In poultry, besides etiology, the epidemiological factors associated with its development and spread are: the HPS status of the flock and the number of visits by the poultry crew, number of flocks raised and light or heat source. For genetic improvement of rural cattle, the crossing of farmer's owned rural cows with Jersey's frozen semen continued. Significant improvements were achieved in major economic traits such as puberty age and milk yield. Similar crossbreeding with Holstein-Friesian semen was initiated. An overall pregnancy rate of 75% was achieved in sheep using the embryo transfer technique. The embryos obtained from the fine-wooled Rambouillet sheep were surgically transferred to synchronize Salt Range sheep, indicating that the local sheep in the area could be improved for the production of fine wool. The efficacy of different by-pass protein sources was evaluated to develop early weaning diets for lambs and calves. Highly encouraging results were obtained and much higher weight gains were achieved with diets containing by-pass protein. In addition, cheap fish-feed for trout farming in Northern areas has been formulated.

## **10. Social Sciences**

The scientists at the Agricultural Economic Research Units are studying the comparative advantages and the farmers' constraints and difficulties in adoption of new technologies. Under the Farming Systems Research Programme, the technologies developed are being modified and refined to fit into the farming systems.

## **11. Agri-Business**

For the promotion of modern technologies for the development of different kinds of agro-industries, PARC scientists are providing services and technical know-how to the interested agribusiness firms. For this purpose, number of agreements have been signed with the firms and services were provided for the production of hydropyricardium vaccine, to help control poultry disease, production of disease-free potato seed, methods of livestock extension and education, pilot production of farm machinery, tools and implements, etc.

## **12. Research Coordination**

PARC is coordinating agricultural research in the country to eliminate wasteful duplication/repetition of research effort(s) and to improve the utilization of research resources in terms of men, money and material. To achieve this, PARC is, inter alia, collaborating for 32 coordinated research programmes, 87 research projects and 86 research schemes on major commodities/disciplines in collaboration with the concerned provincial and federal institutions as participating units. Besides, PARC is funding a number of research projects out of its own funds as well as funds received from donor agencies. The projects submitted to PARC are jointly reviewed by the respective PARC Technical Committee, which

is represented by PARC as well as provincial/federal experts from the research, extension and education spheres.

## **V. SCIENTIFIC & TECHNICAL SUPPORT SERVICES**

To strengthen the National Agricultural Research System, PARC is maintaining a number of support service units, mostly at NARC. The major ones include a Genebank where over 17,000 indigenous and exotic accessions of about 30 crops are being maintained at zero degree centigrade temperature. This facility is unique in the country. It has recently been expanded and modernized with Japanese collaboration. Besides getting germplasm from various international institutions, the germplasm of major crops is also being imported in large quantities and supplied to the collaborating institutions.

A modern national agricultural reference Library and the computerized Documentation Centre are the other important facilities at NARC. This Centre is procuring the latest research information from over 173 countries of the world and regularly making it available to the scientists to keep them abreast of the latest research developments in their areas of interest. Modern technologies including CD-ROM are being employed to readily dispense information to the scientists.

### **1. International Liaison**

PARC is responsible to develop linkages with other countries, international institutions, aid-giving agencies and so on. So far, 17 Memoranda of Understanding and collaborative agreements have been signed with foreign countries/institutes to promote the exchange of agricultural experts and research material(s) to mutually benefit from each others' experience.

### **2. Manpower Development**

The Council has so far launched a number of programmes to produce qualified manpower, both at the foreign and local universities. So far, more than 400 scientists have been trained at M.Sc., and Ph.D. levels, while 5618 scientists/farmers received short-term training. Apart from it, to expose the agricultural experts to modern developments taking place in foreign countries, PARC is regularly sponsoring their visits/trainings abroad.

### **3. Agricultural Communication**

A comprehensive publication programme is in operation at NARC and so far more than 350 publications have been brought out, and distributed at national and international levels.

An audio-visual complex at NARC has produced 35 video documentaries for television and over 100 radio programmes to disseminate information on agricultural technologies to the extension workers and farmers.

PARC has established four Provincial Agricultural Communication Support Cells which are fully equipped with hardware and trained manpower to make use of audiovisual aids.

PARC has actively participated in a number of regional programmes including SAARC. PARC is also a founder member of APAARI and has served on its Executive Committee. It also collaborates with a number of CG Centres.



# REGIONAL ANIMAL PRODUCTION AND HEALTH COMMISSION

## FOR ASIA AND THE PACIFIC (APHCA)

**T**he Animal Production and Health Commission for Asia, the Far East and the South-West Pacific with its official acronym, is an inter-governmental Body established in June 1973 under Article XIV of the FAO Constitution by the 60th Session of the FAO Council. It became operational on 29 December 1975 when the fifth and sixth FAO member countries signed the Instrument of Acceptance of the Text of APHCA Agreement. The six countries were Thailand, Sri Lanka, India, Philippines, Nepal and Bangladesh. The draft text for such a Commission was proposed by the Fifth Regional Conference on Animal Production and Health held in Kuala Lumpur in 1971. The FAO Governing Body (Council), in approving the establishment of the Commission under Article XIV of the FAO Constitution, had referred to the special and unique character of a Commission such as this as against numerous other subsidiary bodies of the Organization.

### TERMS OF REFERENCE

APHCA is the Commission established to technically modernise livestock production and health practices under Asian farming systems. More specifically, its aim is the promotion and expansion of animal production and health in the participating countries according to certain priorities spelt out at the Commission's Sessions. These priorities are also relevant to the Asian development context.

APHCA's basic objective is to re-discover and update Asian agriculture and animal husbandry practices so that they may be shared among the millions of small farmers in the Region on the basis of experiences gained by the whole generations of farmers. Its operational thrusts aim at action-oriented programmes, making a breakthrough in rural livestock agriculture and resources development. The priority programmes of the Commission highlight on control and eradication of livestock and poultry diseases of major importance; feeds and feeding; buffalo research and development; dairy development and integrated crop/livestock/fish production systems. These programmes are being implemented by applying the philosophy of "collective self-reliance and mutual assistance" and establishing a balanced cooperation among member countries.

### MEMBERSHIP

Its membership is open to all countries who are members of the FAO and also to those who are members of the United Nations and falling wholly or partly within the area bounded by latitude 50° south and longitude 60° east and 160° west, referred to as the Region. There are, at present, fourteen member countries namely: Australia, Bangladesh, India, Indonesia, Iran, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka and Thailand.



### ROLE OF COMMISSION

The commission has been holding its Session once every year since its inception. The number of membership has increased from nine in the first Session in 1976 to fourteen in the fifth Session in 1980. Participation of member countries to the past 17 Sessions was always satisfactory with the average participation rate of over 80 percent.


Member governments designate National Authorities and Permanent Delegates who are responsible for taking measures to implement the Agreement, establishing the Commission and for all communications with the Secretariat and with designated National authorities of other Members. This arrangement has successfully established a very effective and concrete working network of veterinary/livestock development agencies in the Region. The authorities served as national focal points to adopt all appropriate measures to ensure national implementation of common regional programmes recommended by the Commission.

The Commission's operational fund comes from membership contributions which are remitted according to the scale of contributions adopted by the Commission. These contributions amounted to a small sum. Additional requirements are met from supplementary contribution and other forms of assistance from members and other sources. The Secretary and part of the Secretarial staff are provided by FAO.

Realizing that lack of funds to implement the Commission's decisions and programmes would form the principal constraint to the achievement of the Commission's objectives, the Commission has evolved an innovative approach in funding through the establishment of National Currency Funds into which members pay money in their national currency or in other currencies to be used for implementing the Commission's programmes.

In the 17 years of its activity, the Commission has functioned as a viable vehicle for the promotion of joint action for the improvement of animal production and health in the region. It has initiated a network of livestock information exchange services and exchange of experiences. The 'Technical Cooperation among Developing Countries (TCDC)' philosophy has been the cardinal principle underlying the approach of the Commission towards the performance of its activities through 'collective self-reliance' and 'mutual assistance'. NCF has been fully utilized to arrange training course/workshop/seminar, exchange visits of small farmers and experts. The following are a few examples of the Commission's accomplishment.

As a true reflection of Technical Cooperation among Developing Countries (TCDC), the APHCA had been instrumental in promoting regional programmes on animal production and health to cater to priority needs.

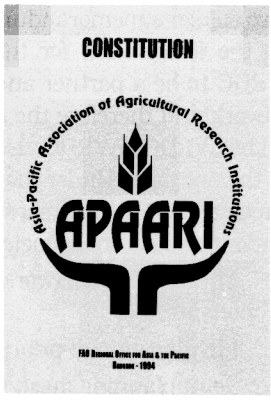


**NEW APAARI PUBLICATIONS**

Dairying in India  
- A Success Story  
(APAARI Publication: 1994/4)

APAARI Constitution

For copies, please write to the APAARI Secretariat.



## EXPERIENCES OF AVRDC FROM NETWORKING

**S. SHANMUGASUNDARAM**

**T**he Asian Vegetable Research and Development Center (AVRDC), as an international agricultural research center dedicated to the improvement of vegetable production in the tropics, has considerable experience in research, human resource development and exchange, information exchange, and institution-building in vegetable improvement with Asian partners.

Financial support for the Center comes from the Governments of Australia, Federal Republic of Germany, Japan, Republic of China, Republic of Korea, Philippines, Thailand, the United States of America, and the World Bank. Special project support is provided by the Asian Development Bank (ADB), IDRC, GTZ, JICA, Japan Shipbuilding Industry Foundation, Rockefeller Foundation, and the Swiss Government.

### Bilateral Cooperation

In the early years of existence, interaction with the National Agricultural Research Systems (NARS) was limited to scientist-to-scientist cooperation. Later, ADB supported the establishment of bilateral programs in the Republic of Korea, Philippines, Thailand, Malaysia, and Indonesia. A regional training program in Thailand with additional support from the Swiss Development Council was also initiated. Following the first phase, the bilateral programs were inherited by the national partners who continued the bilateral activity with their own funds. Annually, AVRDC invites the Directors of the bilateral programs to come to AVRDC annual progress and planning workshops and report on the progress of the program and raise issues for discussion.

### Asian Vegetable Network

In 1988, ADB commissioned a consultant to review the progress made by national partners through their collaboration with AVRDC. ADB also organized a consultation workshop to review vegetable research in Southeast Asia. Senior policymakers and vegetable researchers from Indonesia, Malaysia, Philippines, and Thailand were invited to participate in the workshop. They were asked about the past, present, and future research policies on vegetable research

in each of their countries. They were also asked to present the benefits gained by their collaboration with AVRDC.

Each country reported receiving a lot of vegetable germplasm and improved breeding lines from AVRDC. They were able to release improved, disease-resistant, high-yielding varieties which benefit the farmer and the consumer. They were also able to train a number of researchers through AVRDC and therefore their research skills are sharpened. Their scientists were able to participate in AVRDC organized meetings and enhance their knowledge base. They were able to receive all literatures and other information on vegetables. A decade ago, some countries were stronger in some areas and weaker in other areas. The strengths and weaknesses varied among the countries.

Recognizing the impact made by NARS through their collaboration with AVRDC, ADB desired to assess the needs for cooperation as well as for further development. There was a general consensus among the representatives of the four countries that engaging in partnership research effort offers distinct strategic advantages. Therefore, they wanted to establish a Collaborative Vegetable Research Network for Southeast Asia called Asian Vegetable Network (AVNET). Thus, ADB was instrumental and NARS were responsible in the birth of the first AVRDC's vegetable network. A joint proposal was developed and ADB approved it for funding in 1989.

### AVRDC's NETWORK MODEL

AVRDC's network model is rather unique. NARS join together and identify priority commodities, constraints and sort out those which are common among the partner countries. Researches on these commodities are already going on in each country with support from their Governments and other sources. However, by working together with additional support, there is more to gain and the issues could be better resolved than by working in isolation. Such issues are picked for networking. Each country is willing to share its germplasm, technology, facilities, and information and ex-

change with their partner countries. To that effect, they have signed a memorandum of understanding in establishing the frame-work for the network. The countries ask AVRDC to be a partner and catalyst and facilitator for the network and therefore the executive agency of the network will be AVRDC. AVRDC also agrees to provide a coordinator for the network. Under the umbrella framework of network agreement the partners can develop several proposals for funding by different agencies. AVNET-I was funded by ADB.

The AVRDC network model includes the following components:

- Identification of priority constraints
- Joint planning meeting
- Development of a master work plan
- Specific skills training
- Support to develop infrastructure, strengthen facilities to implement work plan
- Backstopping by AVRDC scientists
- Monitoring and midterm review workshop
- Minor midcourse changes in the master plan
- External review by the Bank appointed consultant
- Final workshop

After reviewing all the constraints they are prioritized based on need, resource availability, research ability, likelihood of success, and their expected impact in relation to input and time.

Joint planning meeting provides opportunity for researchers to discuss who will do what, when, where, how, and what it will take to do and what resources we have and what we need. It will also help decide who will take responsibility for each of the activities and how the exchange mechanisms will work. All the above activities and sharing of resources by each country will be agreed and spelt out in the master plan. Each researcher and policymaker from each country involved in the network has a copy of the master plan and he understands exactly what is expected of him.

Special skills for training related to the network activity is an essential component. Sometimes training is offered by AVRDC and for some specific topics, specific NARS with ample strength take the responsibility and offer the training. Retaining the trained staff members to implement the network activity is equally important.

When trained scholars return to their countries based on the requirement already agreed upon in the master plan, support is provided from the network to develop facilities and infrastructure to implement the work plan.

AVRDC scientists and network coordinator from AVRDC, and sometimes specialists from countries visit the network activities and assist in resolving the issues that arise during implementation.

During the project's midterm a review is organized in a country and researchers from all countries report the progress made and raise concerns during the execution of the work plan. Based on the need, minor adjustments are made to overcome the concerns to successfully implement the work plan.

The donor also enlists the services of a consultant to

independently review the progress of the network and ascertain the need in the future.

At the end of the network period, a final workshop is organized and the impact made by the network is evaluated, and the mutual benefits gained by the project are assessed. At the same time, scientific knowledge gained through such cooperation is also documented.

The proceedings of the final workshop will serve as the final report of the project. Based on the progress, further activities will be jointly planned for the network.

### **Accomplishments of AVNET-I**

AVRDC's first experience in networking is with South-east Asian countries, with which, it had close collaboration for more than a decade. The administrative procedures and scientists' willingness to collaborate were excellent. The priority research topics chosen for the network were also interesting to the researchers. As a result, vegetable research moved in accordance with a regional master plan.

In three years, AVNET blazed new trails in vegetable research and development. Two subnetworks were created to realize the network's goal: the germplasm improvement and disease elimination subnetwork, and the integrated pest management (IPM) of diamond-back moth (DBM) subnetwork. These subnetworks addressed the production of regionally important crops: yard-long bean, cucumber, tomato, chilli pepper, shallot (onion), bulb onion, garlic, and crucifers.

Under the germplasm subnetwork, activities included the assembly, multiplication, exchange and evaluation of the germplasm of priority vegetables; and screening for resistance to bacterial wilt, anthracnose, and pepper viruses. In the management of DBM, activities focussed on the mass rearing of parasitoids and their release in pilot sites and biological control.

In the project's three years of implementation, national research capacities of the four NARS were strengthened. Cost-effectiveness was promoted through the sharing of resources, better use of information, and reduced duplication of research. Research methodologies and skills were improved. Information and materials collected collaboratively and exchanged among the four countries enhanced the spirit of cooperation. Also, by observing research management in one country, scientists were able to improve their respective research efficiency.

The identification of promising new varieties with better yield and consumer acceptability through the assembly, multiplication, exchange and evaluation of vegetable germplasm among the NARS proved that improved varieties from one country can be equally adapted to another country within the region. Adoption of new vegetable varieties will increase production and improve farmer's income. This, in turn, will make available high-value produce to solve hunger and malnutrition, especially among children.

In screening for diseases, tomato and pepper accessions found resistant to bacterial wilt, anthracnose, and viruses can be recommended to farmers to solve production constraints caused by these diseases. These new sources of improved materials are also valuable for breeding for resistance and other desirable characters.



The identification of different pathogen strains through extensive surveys conducted in all four countries could be very helpful in future disease management programs.

To improve researchers' skills, trainings on germplasm evaluation, anthracnose and bacterial wilt screening, pepper viruses, and IPM of DBM were organized. New equipment and accessories were acquired to complement the research capability of the four participating countries. To strengthen the screening for diseases, insect-proof screenhouses were constructed and the necessary equipment provided. Mass-rearing facilities for the IPM of DBM were, likewise, installed.

Meanwhile, the adoption of the IPM of DBM technology - using parasitoids and biological insecticides - by participating farmers from the collaborating countries resulted in a significant reduction in pesticide use and reduced production cost considerably in cabbages.

In Indonesia, an average of 51% reduction in insecticide application in nine pilot sites was noted using IPM. Likewise, the yield of crucifers increased by 5%. In the highlands of Malaysia, an 86% reduction in insecticide

spray was observed, also a 5% marginal increase in production and a 15% increase in net returns was observed. In the lowlands, there was a 57% savings in spraying cost and a 50% increase in yield due to IPM with a 35% increase in mean net returns.

In Thailand, a 23% savings in spraying cost was observed among collaborating farmers. And in the highlands of the Philippines, a 61% reduction in insecticide application was noted, with a savings of US\$ 503/ha per cropping season.

In all four countries, IPM has become a national policy as a result of the success of the project.

To bring the fruits of research to the doorsteps of the end users, AVNET also worked with NARS to disseminate relevant vegetable research results, with AVRDC serving as the clearing house for information.

To sustain the momentum of success of the first phase, the joint proposal developed by NARS for AVNET-II was approved for funding by ADB in March 1993.

*(To be continued in the next issue)*

## BIOTECHNOLOGY ADVISORY COMMISSION

**A**n international Biotechnology Advisory Commission (BAC) has been established by the Stockholm Environment Institute (Address: Box 2142, S-103, 14 Stockholm, Sweden). This group will, on request, provide national authorities with impartial advice for evaluating the applicability and safety of biotechnologies. Members of the Commission are based in 11 countries around the world and, in combination, have many years of experience with scientific, economic and legal issues surrounding biotechnology research and development. The BAC is prepared to assist with the risk and benefit analyses of proposed specific introductions of genetically modified organisms through independent reviews.

### HOW WILL IT WORK?

In response to specific requests, for example, how to assess a particular genetically modified organism prior to field testing, BAC will provide evaluations of the important, relevant issues. Any advice offered will be based upon background data provided from the applicant, information obtained through special sources (e.g., ad hoc Task Forces sponsored by the Commission), and the collective knowledge and experience of the Members. It is intended that advice will be in a form that may be useful to regulatory authorities in their decision making.

### EXPERTISE AND EXPERIENCE

Recognised internationally in their respective fields, Commission Members are scientific, economic and legal experts whose judgement commands respect. This is evidenced by their extensive experience in national and international biotechnology programmes.

Members are based in developing and industrialised

countries. They have been drawn from the public and private sectors. While environmental focus is prominent in their backgrounds, they provide expertise in the fields of:

Applied Ecology; Ecological Genetics; Microbial Ecology; Microbial Biochemistry; Molecular Biology of Plants and Microorganisms; Molecular Genetics; Entomology; Genetics; Marine Biotechnology; Plant Breeding; Plant Pathology; International, Environmental and Regulatory Law; and Economics.

### OPERATING PRINCIPLES

Consistent with the formation of an independent commission, the BAC will:

- i) in the first instance, provide advisory services solely on, and on-request basis to appropriate governmental and intergovernmental authorities responsible for the evaluation of applications of biotechnology products in developing countries. At the discretion of the Commission Members, requests from other entities may be accepted;
- ii) initially focus on products currently being considered for testing in the developing world. Accordingly, genetically modified plants and microorganisms with various traits are likely to feature prominently in the first reviews, but other applications of biotechnology will be considered; and
- iii) safeguard proprietary information and respect requests for confidentiality. However, the extent of privacy requests should be considered in light of the intent for BAC recommendations to be transparent and, whenever possible, made publically available.

## INFORMATION ABOUT SOME FUTURE CONFERENCES

1. Title: Asia Edible Oil Markets' 95 Conference  
 Venue: Singapore  
 Period: 30-31 March 1995  
 Contact: Mr. V. Subramanian  
 Conference Manager  
 IBC (Asia Pacific) Conference  
 196 Somerset Road  
 #16-01/02 UOL Bldg.  
 Singapore 0923  
 Fax: (65) 733 5087
2. Title: 2nd TAMNET Meeting  
 Venue: New Delhi, India  
 Period: 21-23 March 1995  
 Contact: Dr. Narong Chomchalow  
 Regional Plant Production Officer  
 FAO/RAPA, Bangkok, Thailand  
 Fax: 66-2-2800 445
3. Title: National Symposium on Recent Trends in Quality Assurance of Natural Aroma Products and Annual Convention of Essential Oil Association of India  
 Venue: Hotel Park, New Delhi, India  
 Period: 2-4 May 1995  
 Contact: Essential Oil Association of India  
 Dua Complex  
 24, Veer Sawarkar Block  
 Shakarpur, Vikas Marg  
 Delhi-110092, India  
 Fax: 011 220 4284
4. Title: Botany 2000-Asia: The Second Symposium on the Family Zingiberaceae  
 Venue: South China Institute of Botany  
 Guangzhou, China  
 Period: 8-12 May 1995  
 Contact: The Secretariat of 2nd Symposium on the Family Zingiberaceae  
 South China Institute of Botany  
 Guangzhou, China  
 Fax: 010 8620 7706205
5. Title: International Symposium on Development of Small and Medium Enterprises for Biotechnology Commercialization in Developing Countries  
 Venue: Manila, Philippines  
 Period: 24-28 July 1995  
 Contact: The Secretariat  
 International Biotechnology Commercialization Symposium  
 Environment Management Program  
 Office, Development Academy of the Philippines  
 San Miguel Avenue, Pasig  
 Metro Manila, Philippines

## RECENT RAPA PUBLICATIONS

Some of the important publications brought out recently by the FAO Regional office for Asia and the Pacific (RAPA) are listed below:

1. Report of the Regional Expert Consultation on the Asian Soybean Network (RAPA Publication: 1994/15)
2. Irrigation Performance and Evaluation for Sustainable Agricultural Development (RAPA Publication: 1994/17)
3. Asia-Pacific Tropical Forestry: Ecological Disaster or Sustainable Growth? (RAPA Publication: 1994/18)
4. ANMAP Institutes and Scientists: Directory (RAPA Publication: 1994/20)
5. Hybrid Research and Development Needs in Major Cereals in the Asia-Pacific Region (RAPA Publication: 1994/21)
6. Report on Expert Consultation on Regional Priorities and Cooperation in Post-Harvest Systems in Asia (RAPA Publication: 1994/22)
7. Report of the Regional Expert Consultation of the Asia-Pacific Network for Food and Nutrition on Household Food Security with Respect to Desirable Dietary Pattern (RAPA Publication: 1994/23)
8. Selected Indicators of Food and Agriculture Development in Asia-Pacific Region, 1983-93 (RAPA Publication: 1994/24)
9. Food and Agriculture Organization in the Asia-Pacific Region (RAPA Publication: 1994/25)
10. Statistical Profile of Livestock Development in Asia-Pacific Region (1983-1993) (RAPA Publication: 1994/26)
11. Water for Life (RAPA Publication: 1994/27)
12. Non-Wood Forest Products in Asia (RAPA Publication: 1994/28)
13. Indigenous Methods of Sustainable Vegetable production in the Kathmandu Valley, Nepal (RAPA Publication: 1994/29)
14. Utilizing Root Crops (RAPA Publication: 1994/30)
15. 15th Session of the Asia and Pacific Commission on Agricultural Statistics (RAPA Publication: 1994/31)

*Note: Copies can be obtained on request from FAO RAPA, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand*