

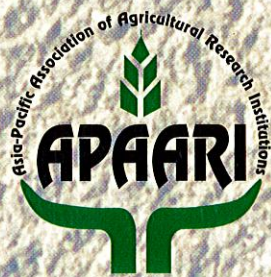
EXPERT CONSULTATION ON RESEARCH PRIORITY SETTING BY NARS IN THE ASIA-PACIFIC REGION AND FOURTH GENERAL ASSEMBLY OF APAARI

(Co-sponsored by FAO, ISNAR and ACIAR and Organized by ICAR)

NOVEMBER 25-26, 1996, NEW DELHI, INDIA



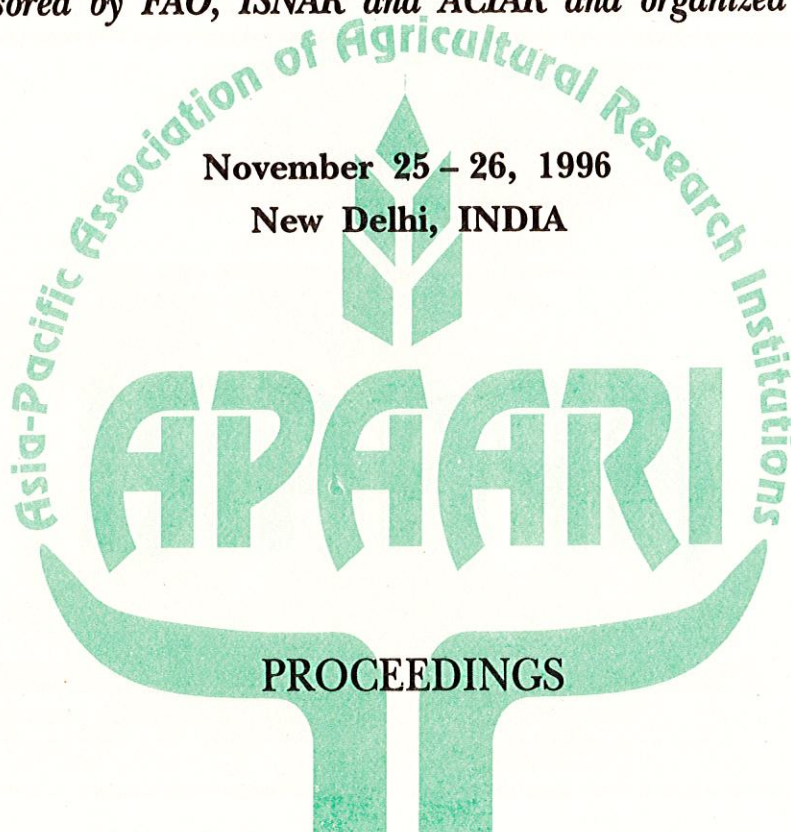
PROCEEDINGS



ASIA PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS

**Expert Consultation
on Research Priority Setting by NARS
in the Asia-Pacific Region
and Fourth General Assembly of APAARI**

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**Asia Pacific Association of Agricultural Research Institutions
(APAARI)**

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Asia-Pacific Association of Agricultural Research Institutions
(APAARI)

PREFACE

The Asia Pacific Association of Agricultural Research Institutions (APAARI) has emerged as one of the stronger and well recognized regional fora that is committed to play a pro-active role in strengthening the scientific and technical know-how in agriculture in the region providing a bridge between the international centres (IARC) and the national agricultural research systems (NARS). The association has strongly recognized the need for regional research priority-setting with collective input of members and to provide support to NARS for planning in the required directions. It is basically through the instrument of mutual collaboration that lasting solutions to food security, sustainable national resource management, equity and social justice, diversification in agriculture and global competitiveness can be ensured in tune with changes in agrarian structure, population pressure and changed economic policies.

APAARI has also been actively participating in various participatory meetings for the NARS-CGIAR driven initiatives on partnership, which is a part of the renewal process of the CGIAR and also paving way for the upcoming global forum. A proposed medium term action plan of APAARI envisages to strengthen global agricultural research through strengthening of NARS-NARS, NARS-CGIAR/IARC partnerships and securing sustained financial support to recognized research priorities to be driven by individual NARS or in collaboration with others.

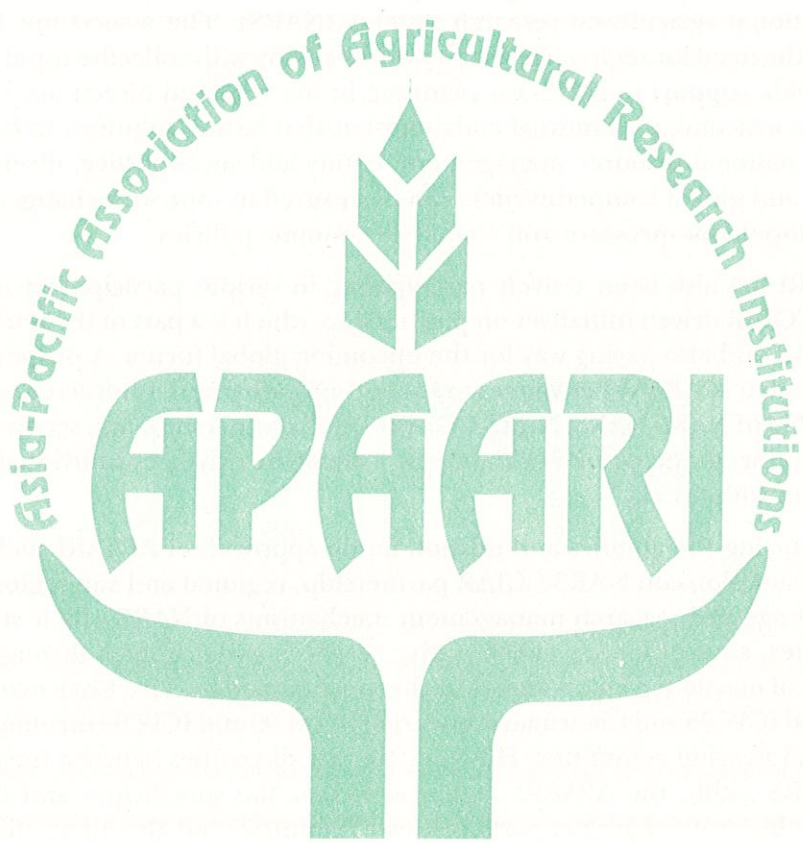
Recognizing the abilities and mission mode approach of APAARI such as holding Expert Consultations on NARS-CGIAR partnership, regional and sub-regional research priority settings and research management mechanisms of NARS - their strengths and opportunities, strengthening collaborative research programmes through networks, publication of newsletter, etc., APAARI has been scheduled for Vice Chairmanship during MTM'98 and ICW'98 and Chairmanship during MTM'99 and ICW'99 meetings as decided by the global steering committee. However, the vast disparities between the capacities of various NARS within the APAARI region as well as the specificities and the needs of various members call for greater participation of countries and also international centres, as associate members, in designing the future action programmes of APAARI.

The proceedings of the APAARI Expert Consultation on research priority-setting by NARS in the Asia Pacific Region held at New Delhi on November 25-26, 1996 and its Fourth General Assembly held in conjunction on November 26, 1996, have been compiled to serve as a useful reference to all actors and the concerned. Generous support from co-sponsors, the FAO, ISNAR and ACIAR, and the Organisers, the ICAR, is gratefully acknowledged.



(R.S. PARODA)
Executive Secretary

1073879



The Association was established in 1973 to promote and coordinate research and development in agriculture and related fields among the member countries of the Asia-Pacific region. The Association's primary objective is to foster cooperation and exchange of information and expertise among agricultural research institutions in the region. The Association's activities include organizing regional conferences, seminars, and workshops, as well as providing technical assistance and training to member institutions. The Association's membership includes a wide range of agricultural research institutions from various countries in the Asia-Pacific region.

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APARI

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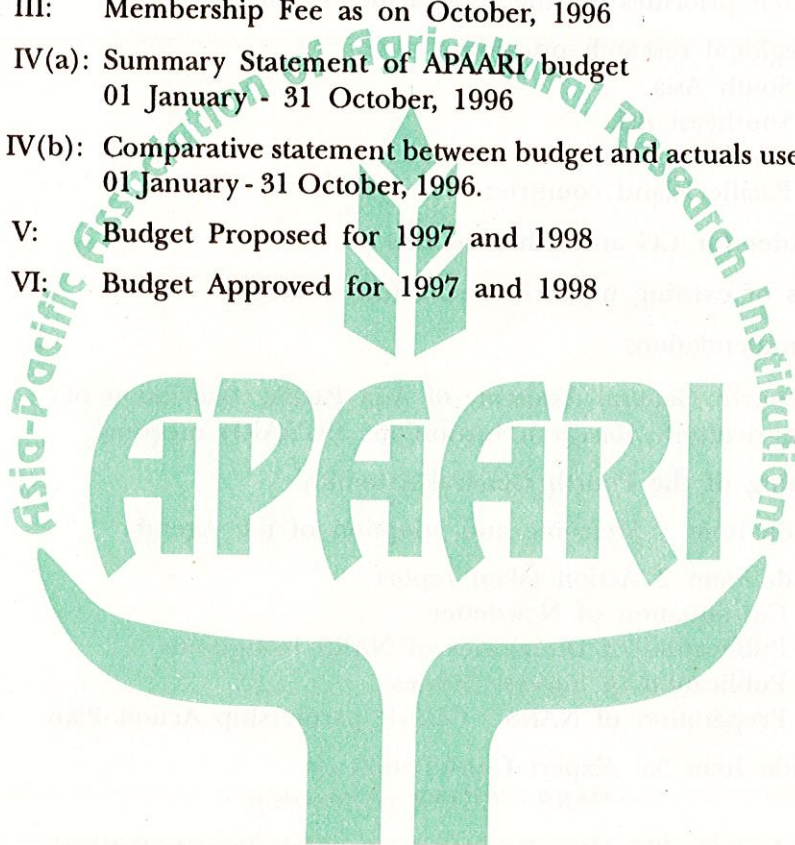
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PART-I

APAARI EXPERT CONSULTATION ON RESEARCH PRIORITY SETTING BY NARS IN THE ASIA-PACIFIC REGION

November 25-26, 1996, New Delhi

OPENING OF THE CONSULTATION

An Expert Consultation on Research Priority Setting by the National Agricultural Research Systems (NARS) in the Asia-Pacific region, co-sponsored by the Food and Agriculture Organization (FAO) of the United Nations, the International Service for National Agricultural Research (ISNAR) and the Australian Centre for International Agricultural Research (ACIAR) was organized by the Indian Council of Agricultural Research (ICAR) and held at the Indian Agricultural Research Institute (IARI), New Delhi, India on November 25-26, 1996.

The consultation was inaugurated by Shri Chaturanan Mishra, Hon'ble Minister of Agriculture, Government of India and President, ICAR and chaired by Dr. Ismail Serageldin, Chairman, Consultative Group on International Agricultural Research (CGIAR) and Vice-President, World Bank. The Director General each of ISNAR, ICRISAT, CIMMYT and IRRI, very senior representatives of the World Bank, FAO, IPGRI, ICARDA, IIMI, ICLARM, ILRI, AVRDC, CABI, Heads of various NARS of members countries, senior officials from these countries, the ICAR, its institutes and state agricultural universities from India including some special invitees participated.

The Expert Consultation was held on wide ranging subjects, viz., research priority setting for the Asia-Pacific region and four sub-regions, i.e., South Asia, Southeast Asia, Northeast Asia and the Pacific Island countries, priorities of CG and other Centres in the region and the present status and future strategies for the existing Networks, such as, TAMNET, UTFANET and CLAN. Final programme and Agenda, as adopted, are given at Annexure I(a) and the list of participants is presented at Annexure II(a).

Dr. R.S. Paroda, Director General, ICAR, and Secretary, DARE, Government of India and the Executive Secretary, APAARI, while welcoming the Chief Guest and the distinguished delegates, mentioned that the incidence of poverty and malnutrition in the region is very high and there is a continuing struggle to ensure adequate agricultural growth so as to meet the needs of ever growing population. Efforts have to aim at enhancing productivity on a long term sustainable basis. He mentioned that APAARI is committed to promote exchange of scientific and technical know-how in agriculture, encourage establishment of appropriate cooperative research and training, assess strength of research organizations and their management capabilities and strengthen linkages among national, regional and international research centres.

Dr. Paroda informed that some new NARS and others were willing to join APAARI. Bhutan participated, among NARS, for the first time and Laos has also shown willingness

to participate. Similarly, ICIMOD was willing to join the APAARI meetings, as conveyed during the just-concluded Second International Crop Science Congress, but could not make up this time.

He recalled that in the last APAARI consultation on NARS-CGIAR Partnership, held at New Delhi during February, 1996, a strong need was felt for research priority setting at national level, keeping in view the respective country's resources. The scope of regionalization was emphasized in this endeavour. The NARS and IARCs in the region together with TAC and donors shall have to work more closely to address several key questions and concepts towards an eco-regional approach to research. In the preceding consultation, it was agreed to promote the exchange of scientific and technical know-how and information in agriculture and to encourage the establishment of appropriate cooperative research and training programmes in accordance with identified regional, bilateral or national needs and priorities.

Dr. Paroda opined that through the instrument of mutual collaboration alone we can think of lasting solutions to ensure food security, sustainable national resource management, equity and social justice, diversification in agriculture and global competitiveness in tune with the changes in the agrarian structure, such as, small scale farming system, and increasing population pressure. The priorities for research have to be revisited. Meeting growing demands for food will continue to be the highest priority of governments in the developing countries. This will call for extra efforts in undertaking appropriate research to solve the complex problems and establishing new research paradigms to meet the challenges.

He recalled that in the recent times, the economic policies have shifted from being inward to outward looking and most of the countries in the region are becoming fully integrated to the global market. With an outward looking policy, it has become imperative for the NARS in the region to strive for greater efficiency and achieve global competitiveness in the agricultural production and marketing. The need has become more important with the membership of these countries to the World Trade Organization (WTO). The economic liberalization provides newer opportunities for enhancing and diversifying trade. With the development of Asian Free Trade Agreements (AFTA), the GATT and an increasing number of APAARI members and associate members, APAARI has initiated formulation of a Perspective Plan which embodies outline and general directions that APAARI would pursue to achieve its mission.

He opined that operationalizing CORRA will promote and support inter-dependence, reduce barriers and ultimately change perspective of all partners, i.e., researchers, administrators, policy makers and donors. He hoped that present dialogue will provide congruence between NARS and CGIAR priorities and strengthen partnerships among them. Effective partnership between and among the constituents would help in research prioritization at the regional level that will bring benefit to the partners.

Dr. Paroda further expressed the belief that depending on inherent individual strengths and those which are likely to be acquired as we go along, complementarity in our efforts and their judicious exploitation would be the key word for enhancing

relevance of institutional set up. Harmonization in their activities, wherever possible, on research, education, and extension fronts, would bring much needed benefits and positively enhance the relevance of our efforts. We will have to address the need-oriented and demand-driven issues in setting our priorities and programmes. The complementarity among the activities of various partners would enhance the ultimate utility of the end results. Hence, it is imperative that the policy issues are kept in the fore-front in our deliberations and commensurate with the policies, priorities are drawn. It would also be worthwhile to deliberate upon policy initiatives required to be further pursued.

Dr. Paroda asserted that based on past achievements, the agreed themes for follow-up action will provide a concrete base for moving forward through constant and mutual consultations. It is the consultation mechanism which would provide clear-cut direction to the respective countries to move, individually and collectively, in an overall framework, for reaping the desired benefit. Tomorrow's agriculture would be far more knowledge demanding; higher skills of management and healthy competition would essentially determine the pace of progress and ensure building up of a better future for our people in the region.

Dr. William D. Dar, Executive Director, PCARRD and Chairman APAARI, acknowledged the contribution, of Dr. R.S. Paroda in his capacity of Executive Secretary, APAARI, and also of Dr. R.B. Singh, the former Executive Secretary, in moving APAARI from strength to strength. He mentioned that presently there were 19 NARS as members and most of the CG institutions were associate members. The membership is likely to increase further in years to come as also pointed out by Dr. Paroda.

Dr. Dar briefed that APAARI has been actively participating in various preparatory meetings for the NARS-CGIAR driven initiatives on partnership, which is a part of the renewal process of CGIAR and the upcoming Global Forum. He also mentioned the very basic presentation of a joint paper by him and Dr. Paroda on the APAARI perspective for the regional developmental needs and opportunities at the International Centres' Week at Washington, 28 October to 1 November, 1996. It was appreciated that the Global Forum recognized the increasing role of NARS and various regional fora, including APAARI. The Declaration of Global Partnership in Agricultural Research was also adopted during the CGIARs' International Centers' Week which aims to explore the needs and opportunities, the scope for collaboration and practical measures to strengthen partnerships between and among agricultural research systems globally.

A proposed plan of action made to strengthen the global agricultural research included strengthening of NARS-NARS partnership and the emerging regional fora and securing of financial support to sustain the global action plan. Dr. Dar also expressed satisfaction, that APAARI is scheduled for Vice Chairmanship during MTM'98 and ICW'98 and Chairmanship during MTM'99 and ICW'99, on a rotational basis with other regional fora, as decided by the global steering committee, which constitutes their chairpersons. This decision was taken at the NARS Preparatory Meeting for the Global Forum, held on 26-30 August, 1996 at IFAD in Rome.

Dr. Peter Rosenegger, Resident Representative of FAO, New Delhi, appreciated the role and achievements of APAARI in recent years. He mentioned the global trends in agriculture research and the developments in light of the recently concluded World Food Summit at FAO, Rome. He emphasized the increased role of markets in determining the priority setting and desired that NARS should identify their priorities and the CG Centres' role should be to bring advance technologies, so that NARS could be benefited. He mentioned that food security would continue to be very important issue for the region and technology change must ensure growth in income to the farmers. He reiterated the continued support of FAO for APAARI's activities so that it could play an effective role in fulfilling its mandated activities.

Dr. Ismail Serageldin, Chairman CGIAR and Chairperson of the Inaugural Session, observed that the World's core objectives of poverty reduction, food security and sustainable natural resource management cannot be met unless rural well-being, in general, and a prosperous private agriculture for small and medium size holders, in particular, are nurtured and improved. Improved technology, appropriate policies and supportive institutions are central to improving the productivity and profitability of agriculture. These should be pro-poor, pro-women and pro-environment. He mentioned that the single most important challenge facing the Global Forum would be that of devising both the priorities of and the modalities for action. It is important that the emerging regional fora help frame regional priorities that reflect a consensus of the NARS and could provide useful input in the design of the CGIAR priorities through the TAC and through the CG-wide discussions that set the agenda.

Dr. Serageldin further observed that based on the kind of priority setting that enables different partners in the emerging global system to have a shared vision, in which the programmes of each partner benefit from the successful work of the others, a stage will arrive to jointly move forward towards action and substance to real research partnerships in the battle against poverty, hunger, environmental degradation, and inequity. Clearly, the voice of the NARS and their regional fora must be central in helping shape this new Global Forum whose establishment was recently endorsed in ICW, 1996 at Washington. Action is urgently needed if we are not to lose the momentum of the Washington meeting.

In this endeavour, Dr. Serageldin asserted the following areas for immediate action, i) commitment to the principle of subsidiarity; as the stated aim is the development of a global system, great care will have to be taken to ensure that participatory, bottom-up arrangements bring about public understanding of global imperatives. Programmes and projects should, therefore, be both planned and managed at the level at which they are to be effectively completed, ii) gather and conserve knowledge of complex resource-use systems developed by the farming communities and worked effectively for thousands of years for appropriate and widespread use, iii) explore the use of mechanisms that build productive linkages between farmers and researchers, iv) agricultural research institutions, both national and international, should recognize farm organizations, community organizations and other NGOs both as potential research partners and as sources of knowledge on societal transformation, v) reinforce the

position of the NARS as the cornerstone of the new global research system. NARS are the key to a global farmer-back-to-farmer interchange that can drive broad scientific advances in agriculture, particularly in dealing with location-specific ecological problems. Capacity building, communication, and respect are among the determinants of a stronger role by NARS, including regional associations of NARS, vi) recognize that NARS include all the essential capacities to undertake agricultural research and the public National Agricultural Research Institutes (NARIs) are the hub of this national system, vii) provide opportunities for the private sector to share its knowledge and resources with other partners, and viii) the CGIAR must see itself as an active participant in further development of the global agricultural research system, as it continues with its mission of carrying out cutting-edge research.

Dr. Serageldin further observed that the CGIAR centres have a special role to play in all this, beyond the context of their work and the manner in which they design and execute the research programmes with their partners. These centres of scientific excellence must act as platforms for exchange of information and for the development of true networks of scientists between the north and the south, as dynamic catalysts to help the movement, already started in some places around the world, and to move away from a senior/junior relationship to one of true partnership.

The leaders of the NARS must see the NARS as including all the agricultural research actors in the country, i.e., the National Agricultural Research Institutes (NARIs), the universities, the private sector, the NGOs, the women groups, the farmer associations and the indigenous people who maintain a vast storehouse of knowledge about biodiversity issues.

While discussing the issue of priority setting, Dr. Serageldin desired that following points be considered :

- i. Favoured versus less-favoured areas
- ii. Traditional versus exotic crops
- iii. Time horizon choices
- iv. Environmental improvement versus yield maximization
- v. Integration of traditional knowledge and new science
- vi. Search for integrated farming practices that reflect local specifications versus the search for new technologies with very broad applications.

Dr. Serageldin made the following three specific suggestions, in conclusion :

- Eco-regional programmes are exceptionally well suited to be the vehicles for inter-NARS and NARS-IARC collaboration, hence need to be adopted.
- The vast disparities between the capacities of various NARS within the APAARI region, as well as the specificities of the needs of various members, call for a greater participation of the regional bodies in designing their own training programmes.
- The Public-Private partnership should get further strengthened to achieve successfully the regional and global agenda.

Shri Chaturan Mishra, Hon'ble Minister for Agriculture, Government of India, while inaugurating the consultation mentioned that agriculturally, the Asia-Pacific region is the most vibrant and has witnessed impressive gains in foodgrain production. In spite of successes, the region has nearly half of the world's 800 million impoverished people, a hard fact which is often repeated and publicized and continues to be a cause of concern. Apparent national level food securities achieved in different South Asian countries hide a large number of pockets of malnutrition. The gap between the national level food security and household level food security is essentially due to the poor economic access to food on the part of the poor. Despite the trends in reduction in poverty in the region, South Asia is estimated to house half of the world's poor people by the year 2020. Our efforts have to aim at an appropriate balance between the productivity and sustainability. In this endeavour, we ought to have eco-regional programmes with combined objectives of restoring and enhancing improved natural resource management, increased production and productivity, while alleviating poverty. There is an urgent need to address key issues of food security, diversification, sustainable natural resource management, global competitiveness, equity and social justice.

Shri Mishra supported the idea that the scope of a regional forum like APAARI has to be broad, as the member countries are differently placed in their human resources, level of economic, technical, scientific and technological capabilities and their abilities to use such capabilities. As such, priority for different countries would differ but with a common goal, i.e., of eradicating poverty, malnutrition and hunger by enhancing productivity and their farm income. Hence, to be mutually supportive, there is a strong need for priority setting, which has to start at the national level so that we gain mutually from one another.

Shri Mishra opined that the collaboration could exploit complementarities in research capacity, enhance the chances of success and reduce the cost. Bilateral cooperation, based on complementarity and comparative advantage, should be promoted for addressing specific problems of concerned countries. Based on local and regional needs of food and nutritional security and economic accessibility, integrated application of the principles of adequacy, job opportunity, gender equity, market accessibility, national and regional sensitivity, eco-regional productivity, environmental plasticity/elasticity would call for well thought out strategy on a changing time scale.

He further mentioned that with the advent of the World Trade Organization (WTO) in 1995, there has been a growing movement towards new forms of cooperation and unlimited competition, even in the agricultural sector. Therefore, the agricultural situation is rapidly changing due to this free trade movement, which is creating unprecedented pressure on Asian agriculture. The liberalization and globalization of the economies have brought in an element of quality awareness of produce in the international market. In order to achieve perfection of our products we must first aim at achieving excellence of our human-resource base which will deliver goods. This may require upgrading of the existing infrastructure at the institute/university level through our own efforts and also through international cooperation.

Shri Mishra desired that the unholy alliance among poverty, food insecurity and environmental degradation must be broken to ensure progress towards freedom from hunger, deprivation and environmental destruction. Considering the future challenges and priority, it was felt that much can yet be achieved through regional collaboration of NARS in the region. A holistic approach involving all sectors and stake-holders for agricultural research is essential. He observed that to eradicate poverty, science and technology must go on and investment in agricultural research be enhanced. As the region is the victim of the past, and the resources would be limited, there would hardly be a room for duplication of efforts. Science knows no boundaries and the necessity is the mother of invention. We need to join hands to achieve the desired results. Specifically in India's context, the Minister desired for greater thrust on research on pulses, conservation of biodiversity, post-harvest technology and water management aspects.

RESEARCH PRIORITIES FOR THE ASIA-PACIFIC REGION

A synthesis of the research priorities for the Asia Pacific region was presented by Dr. William D. Dar. Four base papers prepared for South Asia, Southeast Asia, Northeast Asia and Pacific Island countries, as a follow-up action on the recommendation of the last Consultation held in February, 1996 covered wide ranging issues. Dr. Dar pointed out that in the Asia-pacific region, production, consumption and the demand be considered important factors for setting the regional research priorities. In the research sector, primary emphasis should be laid on improving the production efficiency and bringing much needed food self-sufficiency. He mentioned that by the year 2020, negative net trade is mostly expected for wheat and maize whereas in case of rice marginally positive net trade may be seen.

Dr. Dar opined that the national research priority setting should take into cognizance the resource conservation, sustainability and development of under-developed regions within the country, besides efficiency and self-sufficiency. He presented the tabulated priorities of each of the four reports and desired for in-depth discussions in the subsequent, concurrent sessions, designated for this purpose, before making recommendations. Dr. Dar also expected that the detailed discussion on sub-regional priority setting and future strategy shall take into account country-wise priorities for major commodity research areas, breeding activities, research planning, protecting the environment, socio-economic policy planning and management. He emphasized the need to consider biotechnology as an important tool for most of the commodities and that the APAARI's Vision towards NARS-CGIAR Partnership, and a perspective plan for APAARI together must embody the vision for nursing the Asia-Pacific region to a sustained growth.

Dr. Dar, while re-emphasizing the increasing positive role of APAARI in the region, was of the view that a specific APAARI action plan should enumerate activities, such as, providing the required technical and funding support for the regional coordination activities such as TAMNET, CLAN, UTFANET, INGER, and other networks; developing a consortia approach for the basic and strategic research on a pilot scale to begin

within some highly relevant and priority areas; and APAARI and NARS should be effectively represented in the priority setting as well as governance of the CG system, among others. The different consortia/networks, which APAARI actively collaborates with, are the Rice-Wheat Consortium for the Indo-Gangetic Plains, the Cereals and Legumes Asia Network (CLAN), the Tropical Asia Maize Network (TAMNET), and the Council for Collaborative Rice Research in Asia (CORRA).

The Rice-Wheat Consortium has been ongoing for two years since its establishment in 1994. It was considered to be a very good model for replication, achieving much through its judicious use of diagnostic workshops, multi-disciplinary teams, improved linkages, training of NARS staff and better sensitizing the IARCs. CORRA was proposed to enhance the effectiveness of the various collaborative mechanisms being employed in meeting the challenges of the global rice research system. Such mechanisms are the International Rice Research Institute (IRRI) and the NARS' effective collaboration in two consortia on Lowland and Upland Rice, and several networks such as the International Network on Genetic Evaluation of Rice (INGER), Integrated Pest Management Network (IPMNET), CREMNET, Asian Rice Biotechnology Network (ARBN), and Simulation and Systems Analysis for Rice Production (SARP). APAARI played a vital role in endorsing the formation of the Council of IRRI and CORRA, which was formally established on March 28, 1996, during the CGIAR-NARS-TAC Dialogue at IRRI headquarters in the Philippines.

The TAMNET is a NARS-driven initiative on maize, bringing together several NARS, the Food and Agriculture Organization (FAO), and the International Maize and Wheat Improvement Centre (CIMMYT). TAMNET has been drawing in the private sector and moving into post-harvest technologies to add value and increase income at the farm level. The CLAN, established in 1992, served as a research and technology exchange network for all the ICRISAT mandated crops, viz., sorghum, pearl millet, chickpea, pigeonpea, and groundnut. It is now clearly agreed upon that an effective regional collaboration among NARS and the CG Centres can achieve much more with APAARI playing a key role in meeting their objectives, including strengthening the networks that address various needs of NARS in the ASIA-Pacific region.

Dr. J.G. Ryan, Director General, ICRISAT presented the TAC vision for research priorities for the Asia-Pacific region on behalf of Dr. Donald Winkleman, Chairman TAC who could not participate due to overlap with TAC meeting in Nairobi, Kenya. He pointed out that TAC's framework for priority setting for resource allocation for the period 1998-2000, rests squarely on the principal concern for poverty alleviation and natural resource conservation in developing countries. Both concerns are people centred, and, in conjunction, they promote sustainable food security. Other considerations important to priority setting are the likely success of particular efforts, the availability of alternate sources of supply for the products of these efforts, the priorities of NARS, and the efficiency and effectiveness of the proposed mode of operation.

TAC's framework on priority setting highlights activities, sectors, commodities and System-wide work. In all, 19 activities were recognized considering four sectors,

viz., crops, livestock, forestry and fisheries. The commodity portfolio, the sector allocations and the System-wide activities played a definite role. With regards to regional allocations, TAC proposes that these should emerge from the primary considerations in priority setting rather than be imposed *a priori*. During 1995, the CGIAR's expenditure for the Asia region amounted to 32 per cent of its total budget. Almost all of the CGIAR Centres have research activities in Asia; four centres, IRRI, ICRISAT, CIMMYT and CIP, accounted for the bulk of the investment.

According to the TAC, two basic characteristics of the Asia and Pacific region merit special attention, viz., i) High density of population in relation to land resources; 54 per cent of the world's agricultural population is living on just 17 per cent of the world's land area and 73 per cent of the world's agricultural population is farming 28 per cent of its crop land, and ii) Almost all the land suitable for sustainable agricultural production is already being farmed and the ratio of crop land to agricultural population amounts to only 0.23 ha per capita, an amount far below that found elsewhere in the world. Yet Asia accounts for 62 per cent of the value of production of crops, livestock, forestry and fisheries in developing countries, ranging from 75 per cent of the value of fisheries, to 71 per cent of the value of crops, to 53 per cent of the value of forestry, to 45 per cent of the value of livestock. Trends in food security are encouraging and Asia, in particular, has made rapid progress with a decline in the percentage of undernourished people from 44 to 16 in two decades ending in 1990 which continues to fall.

Talking of the challenges facing agricultural research, Dr. Ryan asserted that there is a need for research on increasing yield ceilings. Asia has some of the strongest NARS in the developing world, it also has many small countries with little capacity of their own. The Asian regional forum recommended that the CGIAR should expand its work on biotechnology, IPM and research on post-harvest losses in the region. The current CGIAR commitment should shift slightly from activities favouring productivity increases towards those fortifying the NARS, particularly for training in specialized areas such as biotechnology and research management.

It was emphasized that specific recommendations on resource allocation should emerge from the primary considerations in priority setting, especially poverty alleviation and natural resources conservation which are complex issues. Increased global priority should be given for activities on pre-breeding and germplasm improvement in livestock, fisheries and forestry. Work on their production systems should also be strengthened. Increased resources be allocated to management of water, post-harvest research and IPM. Work on protecting the environment should be maintained at the same level and certain changes in the orientation of research on natural resources management should also be carried out. Activities with generic rather than local application, those understanding the role of community and institutional organizations in fostering adoption of improved management techniques, and also those integrating productivity increases with resource conservation and biodiversity should be taken up. The resources should be shifted from policy analysis on trade and markets to economic and social analyses. Increased resources be assigned to the organization and management of

institutes. With respect to NARS strengthening activities, more emphasis should be given to specialist training rather than to training on production.

TAC is of the view that prioritization for commodities should be finalized giving careful consideration to the relevance of the proposed commodity research to the poor, especially female rural poor, resource conservation, alternative sources of supply, new scientific developments, as they affect probability of success, and impact of research, and to working relationships with other institutes. In the end, Dr. Ryan reaffirmed on behalf of TAC that the Asia-Pacific region will continue to receive a major share of the CGIAR's resources which may increasingly be provided from countries within the region. He too emphasized the need to encourage countries of the region so as to invest a much larger proportion of their resources into research.

Dr. C. Bonte-Friedheim, Director General, ISNAR presented ISNAR's role for strengthening NARS research capabilities in the APAARI region. While acknowledging for the invitation to ISNAR to address the APAARI meeting, he shared views on ISNAR's future role in the APAARI region. ISNAR is convinced of the importance of regional associations, as one important pre-condition, to be successful in building a global but fair agricultural research system. Such system will be required to meet global goals like eliminating hunger, reducing poverty and protecting the environment. ISNAR considers APAARI as representing a very unique region, which ISNAR is looking at, for possible collaboration to effectively strengthen Asian NARS. In January 1997, ISNAR will finalize medium term plan for 1998-2000 for which the Consultants' Report will provide vital inputs.

Dr. Bonte-Friedheim told that ISNAR has been associated with APAARI for some time, and is interested in some form of its associate membership. He was of the view that the flow of information through effective linkages between the association and its members and among the members should be of the highest priority. The NARS, donors, the CG System, regional associations and others, need a database about Asian NARS which needs to be shared widely. ISNAR has the experience of collecting and analyzing data, especially in the African NARS. Therefore, he suggested that a joint workshop should be held to train NARS professionals, including university staff, in collecting and analyzing data. ISNAR would then help APAARI for the regional analysis based on which further possible improvement of NARS organizations and structures could be made.

Research planning and priority setting continues to have a high priority and is closely linked to and determined by the government policies. The closer NARS-NARS partnerships of APAARI could be extended to strong tripartite relationships with ISNAR. He felt that there are too many priorities regarding organization and management of NARS, which is understandable in the light of divergent NARS set ups in the region.

Sub-grouping in APAARI can recognize the different natural, social, economic and political conditions between countries as well as traditional linkages and thereby improve the efficiency of collaboration. ISNAR wanted to raise the case of another

potential sub-group, namely, Central Asia, or to be defined as North Asia, and to look up at possible collaboration of the system with Central and Eastern Europe and the newly independent states in Asia. These countries may have the choice of either forming their own subgroup in APAARI or form their own regional association.

Dr. Bonte-Friedheim further pointed out that some of the approaches selected in the APAARI region constitute global priorities which was highly commendable. ISNAR urgently needed some partner institutions in the region to strengthen NARS, as per its mandate, and to make them more effective and efficient. He recognized NAARM of India, set up under the aegis of the ICAR as an institute for the agricultural research management which, although at present with a purely national mandate, is quite close to ISNAR's own mandate and holds a 14 year relationship with it. ISNAR can definitely support national, ISNAR like, institutes in other big countries in APAARI region, in their development phase, expecting that very soon they will assume some regional responsibilities within the NARS-NARS partnership endeavour.

ISNAR proposes to employ regional fellows, to be posted close to the Headquarters or the Secretariat of the regional organizations, through funding from some donor countries or associating with junior experts from that country so as to assist certain countries in the implementation of donor-financed projects in order to strengthen their agricultural research system. ISNAR may outpost a highly experienced and qualified professional who will be available to assist two or three countries in project implementation, and at the same time be available for special ISNAR assignments, mostly within the region.

ISNAR hoped to convince the Asian Development Bank to provide the necessary funds for a project in Asia and the Pacific. Most of ISNAR's additional activities in the APAARI region would have to be financed from donor funds or from a small core budget. If ISNAR is to become more active in the APAARI region, then ways and means must be found either to increase the budget, or to create and finance special projects.

A few questions which Dr. Bonte-Friedheim raised in dealing with improving the future role of agricultural research are, a) Agricultural research is facing a number of important changes which need to be speeded up and their positive effects maximized while minimizing the negative effects. Some of the major changes could be, i) structuring, organization and governance of research systems; will the Council system survive? ii) improving the collaboration between different research organizations and institutes, public funded private sector, universities and NGOs, and iii) the future funding of agriculture research, b) Standard approaches to evaluate research institutes, research programmes and researchers, c) Regionalization of research, d) Linkages of research, horizontally and vertically, with extension services, NGOs and farmers, between agricultural research and policy makers. The world food summit has also raised the need for better and possibly even more agricultural research, e) Research policy of NARS be reconsidered in order to design and implement their research programmes more efficiently, effectively and equitably. This may lead to a redesigned research

system. The research policy will provide objectives and priorities. The new system must consider the role of the public and private sectors, universities, NGOs including farmer's organizations, in agricultural research planning, implementing and financing.

TAC feels that a strong APAARI requires strong NARS with the will to promote effective and efficient agricultural research at the national and the regional level, accepting a responsibility to help the weak NARS and showing commitment to work for the well-being of the present as well as future generations. A strong APAARI will also be an important partner with CG System when serious discussions will start about the global agricultural research system and eco-regional project. In the end, Dr. Bonte-Friedheim emphasized the need for an efficient steering of the process and system. He asserted that the necessary R & D support be provided for the immediate and long-term benefits for each country, region and the globe.

Following the presentations, a few important questions were raised and observations made by NARS leaders and CG Centres' representatives. Dr. Amir Mohammed, ISNAR consultant from Pakistan, commended the role of APAARI in the region for concentrating on areas which are mostly neglected by others, such as, organization, management and transfer of technology rather than generating technology alone. He was of the view that since organizations other than NARS are also engaged on agricultural research in the countries, efforts should be made to define a core, for the APAARI leadership, and also the other actors. He commended the role of Indian NARS and the APAARI leadership.

Dr. C.M. Anwar Khan of Pakistan NARS opined that although the productivity enhancement in the region is significantly realized yet this can be further accelerated to achieve up to 40 per cent, as a quantum jump. He suggested the need to adopt participatory approaches and also laid emphasis on exchange of information on success stories from member countries.

Dr. J. Chandra Gautam from Nepal NARS stressed the need to have stronger NARS-NARS interaction. He informed that much of the work done on agriculture in Nepal is in the mountainous region which can be shared with others and also strengthened.

Dr. Nazm-ul-Haq of the ICUC pointed out that traditional underutilized crops form a significant part of the agricultural systems. These crops should also be included in the priority sector.

Dr. R.S. Paroda, from Indian NARS advocated the idea of ISNAR to engage one regional representative who could look into the requirements of NARS and work in close collaboration with APAARI. He told that most of the NARS in the region are better organized than the NARS in other regions and also agreed to the suggestion that many new NARS have to be brought into APAARI's fold.

Dr. Paroda further pointed out that the proceedings of the February, 1996 meeting enlist some suggested research priorities, on pages 70 and 71, which may be taken into consideration while finalizing sub-regional priorities. Among the commodities,

for example, Dr. Paroda recommended soybean to be accorded high priority. He also suggested to follow the approach of pooled research partners, Consortia or Networks approach. He showed concern for the present, limited funding of APAARI, which is raised on the basis of membership fee alone, limiting its efforts to strengthen regional research collaboration and also appreciated a recent decision of A&P Division of FAO, Rome, to subcontract APAARI to field a study to assess and advice on action plan regarding present status of availability and use of germplasm in genetic enhancement of important crops by the Asian NARS in APAARI region by earmarking US\$ 25,000. Dr. Paroda emphasized that Networking, such as TAMNET, on equal partnership basis, is important to share resources and improve efficiency and quality of research output.

Dr. T.G. Reeves of ICRISAT appreciated the commitment and political will in India to strengthen national agricultural research and cited examples from the inaugural speech of Sh. Chaturanan Mishra, Hon'ble Minister of Agriculture, Government of India and President, ICAR.

Dr. R.B. Singh, the first Executive Secretary of APAARI, informed the house that wheat and rice alone and also the wheat-rice system have all been given high research priority in South Asia. He suggested that the non-congruent priority points, as suggested by various NARS, should be particularly screened in the sub-regional group meetings and also that the non-technical component of policy matters should be given a high priority. However, Dr. William Dar, Chairman, APAARI added that water resources management issues should be accorded high priority in all the sub-regions.

SUB-REGIONAL RESEARCH PRIORITIES

Considering the fact that research priorities would vary in different agro-ecoregions, four sub-groups were formed to discuss respective reports of the sub-regions and suggest research priority areas which need to be pursued through regional and inter-regional collaboration. Observations and recommendations of these four groups are presented here.

i) *South Asia*:— An informative base paper prepared on the agricultural research priorities in South Asia was presented by Dr. R.B. Singh. The sub-region, comprising of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka, is thickly populated, accounting for 21 per cent of the world's population on only 3 per cent of world's total land area. Out of about 1.35 billion people living in South Asia, nearly 300 million are food insecure and these countries have 50 per cent of the world's malnourished children which emphasizes the need for prioritizing efforts to eliminate persistent hunger. Food demand in South Asia is expected to grow annually by about 3 to 3.5 per cent in the next five years, essentially due to projected population growth rate of 1.8 to 2 per cent. This food demand is expected to push up further by 1 to 1.2 percent due to an expected increase in income by 3 per cent resulting in enhanced food purchasing power of the people.

South Asian economies are considerably agrarian in nature, their share of agriculture in national GDP ranging between 26 to 60 per cent and in employment sector, agriculture accounts for even higher shares. A reduction in the level of contribution of agricultural GDP to the total national GDP was seen which calls for scientific development of production based and value oriented agricultural sector. Research on increase in productivity must also be oriented towards enhanced genetic diversity to help maintain agro-biodiversity in the sub-region.

New agricultural research priorities need to address complex issues of natural resource management, agro-ecological, environmental and socio-economic complexity, productivity gains and synergistic participation of all sectors involved in the development process. About 50 per cent of total land area in South Asia is already under arable land and permanent crops, 20.6 per cent under forest and wood lands and 4.8 per cent under permanent pastures as against respective figures of 11, 32 and 26 per cent for the world. Use of NPK fertilizers has considerably increased in South Asia over the past decade. An increase is also witnessed in per cent of cultivated area under irrigation and farm mechanization in respect of number of tractors available for agricultural operations. However, faulty water management practices have aggravated the problems of salination and water logging, particularly in the most fertile/ productive regions of India and Pakistan, affecting yield of major crops.

Production scenario for cereals in South Asian countries is impressive. Over 270 million tonnes of cereals produced account for 14 per cent of the world's total cereal production. However, there is a lot of scope to improve upon yield level which is 2.1 t/ha as against world average of 2.8 t/ha. It is encouraging to observe that the yield growth rate of 2.8 per cent in South Asia is more than double the growth rate (1.3 per cent) in the world. Considerable increase in yield growth rates were also witnessed in oil crops (Oil equivalent), total fruits and vegetables, jute, seed cotton and sugarcane but pulses, roots and tuber crops and tea need further research attention; and in production growth rates for milk, total meat, poultry meat, eggs, marine fisheries and apiculture whereas research on increased inland fisheries production needs further attention to match with world production figures.

Estimates show a balanced supply and demand projection for rice by the year 2020, but in case of wheat a deficit of over 21 million tonnes is expected by the same period. Domestic expenditure on agriculture in South Asian countries needs to be increased and research given high priority with enhanced funding. Some salient developments, perspective approach to development and food security in South Asia included: improvement in per capita food grain availability, achieving per capita calorie intake closer to the accepted norms, improvement in food intake of the poorest section, virtual abolition of starvation deaths and greater stability in consumption in the face of fluctuating production. In spite of this positive side of picture, situations which may cause concern in future are: food deficit, slackening growth in agricultural productivity, rising real prices of foodgrains and nutritional insecurity.

The region should attain a large degree of food self sufficiency to ensure food security through improvement in agricultural productivity; the national agricultural research systems must be strengthened and ensured resource support equaling at least 1 per cent of GDP; the countries should accustom preparedness for prevention and management of disaster and calamities; agricultural price policies should ensure increase in agricultural income of the poorest of the poor; human resource development and employment in agricultural sector and empowerment of women work force in agriculture need special attention.

The sub-region is rich in agro-biodiversity, which unfortunately is eroding fast. All the countries have established national programmes on germplasm and have taken steps to establish their national gene banks. Agro-biodiversity in the sub-region has already contributed several important genes to the world agriculture but a lot more is unknown.

The key issues, which emerged among South Asian countries, in common, for the agricultural research priority, are as follows:

1. Management and improvement in Rice-Wheat Systems
2. Improvement in productivity of major commodities
3. Conservation management and utilization of components of agro-biodiversity
4. Value addition in germplasm
5. Enhancement in agricultural income growth rate to promote food self-reliance
6. Improvement in post harvest management and technology
7. Integrated management of biotic and abiotic stresses
8. Systems Research
9. Enhancement in production through increased productivity and integrated management in specific situations, such as, rainfed areas, saline, sodic or acidic soils
10. Socio-economic and policy research
11. Integrated management of natural resources; differentiating natural resources, agricultural potentials and technological opportunities
12. On-farm conservation and use of germplasm resources and equitable sharing of benefits arising out of their use
13. Prioritizing, and integrated research on, non-conventional or underutilized crops.
14. Prioritizing non-conventional feed resources and their utilization for increased nutrient availability
15. Management of major prevalent and emerging diseases through diagnostics and vaccine production to increase productivity and export potential of various livestock and their products
16. Strengthening biotechnology and other basic research

17. Indigenous Technology Knowledge (ITK) feed back, socio economic growth and policy research
18. Participatory approaches for technology assessment and transfer
19. Seed production and technology
20. Agricultural Human Resources Development (AHRD)
21. Biosafety in use of biodiversity and biotechnology
22. System-wide initiatives

Strategies, those emerged, to meet the challenges for food, agriculture and environment in South Asia were as follows:

- i. Increase investment in agricultural sector
- ii. Enhance access to improved agricultural technologies
- iii. Develop productive, sustainable, environmentally friendly technologies
- iv. Strengthen efforts to protect the environment and traditional resources, such as landraces
- v. Improve commercialization of agriculture
- vi. Improve money based economy (as compared with bartering and trade linkages)
- vii. Increase investment in human resources to alleviate poverty and the level of education
- viii. Improve governmental policies and inter-governmental linkages

There was general endorsement of the sub-regional priorities presented by Dr. R.B. Singh. However, important points raised in the ensuing discussion included that:

- food security should be the key objective of this sub-region
- more emphasis is required for institutional capacity strengthening of small NARS.
- greater emphasis needs to be given to mechanization, post-harvest technologies and feed/fodder production
- alternative agricultural systems such as organic farming, afforestation/agro-forestry, natural fibers and non-conventional energy sources could be considered
- training of scientists in biotechnology research is critical

There was strong agreement that current NARS-NARS and NARS-CGIAR collaboration, in general, proved to be successful and should be given continuing support by concerned partners. Examples of Rice-Wheat Consortium, TAMNET and CLAN could be useful models.

There was a good deal of enthusiasm to identify new opportunities for coordination, collaboration and integration of efforts. It was opined that the collaboration should be encouraged in areas where the benefits of partnership are expected to significantly

improve outcome of progress over efforts by an individual country. These opportunities were considered and grouped under two categories:

i. *NARS-NARS collaboration:*

The range of opportunities proposed included:

- Waterlogging/salinization/ground water technology,
- Degraded and marginal lands,
- Enhancing agro-biodiversity,
- Biodiversity, biosafety, IPR, quarantine and biotechnology,
- IPM and regional pest/disease management,
- Various cash crop production systems: cotton, jute, soybean, sugarcane and oilseeds,
- Vegetables/Fruits and
- Aquaculture

ii. *NARS-CGIAR (including NARS-NARS-CGIAR) collaboration*

In this context, the following additional priorities were considered:

- Mountain/hill farming systems
- Heterosis/hybrid technology
- Post-harvest and value-addition research
- Information management system (ISNAR/CABI/ others)

After the discussions that followed, the following proposals were agreed to be given high priority for sub-regional/regional collaboration:

- Mountain/hill farming systems research
- Biodiversity/biosafety/IPR/quarantine/biotechnology
- Cotton-based systems (including IPM and regional pest/disease management)
- Soybean improvement
- Aquaculture
- Information management systems (improvement, accessibility, compatibility)

ii) *Southeast Asia:*—The base paper for research priorities in the sub-region was presented by Dr. William D. Dar. The southeast Asian countries, comprising of Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand and Vietnam accounted for 447 million people in 1995 and a high population growth rate ranging from 2.9 per cent (in Vietnam) to 6.1 per cent (in Laos). In the region, the per cent population under poverty line is high (25 per cent in Indonesia to 54 per cent in Vietnam) except for in Malaysia (16 per cent). Even in Thailand, which is one of the fastest growing economies in the sub-region, the incidence of poverty is high (30 per cent). Agriculture remains an important sector and accounts for a large share to GDP in many countries,

such as 57 per cent in Laos and 34 per cent in Vietnam. The share of agricultural labour force has remained unchanged at approximately 70 per cent over the past decade.

Production of major crops more than doubled in 27 years, increasing from 94 million tonnes in 1966 to 226 million tonnes in 1992. Out of the total food grains production 53 per cent (118 million tonnes) was rice alone which increased at the rate of 3.2 per cent per annum. Per capita consumption of rice has recently declined from average rate of 3.1 per cent, whereas wheat demand has increased at the rate of about 5.6 per cent. However, a rise in per capita demand for cereals/staples comes from low income countries especially Cambodia, Myanmar, Vietnam, Laos, Indonesia and the Philippines. Demand for cereals is expected to grow annually at a rate of 2 per cent. Large imports of wheat and maize are projected to increase since the sub-region practically grows no wheat and also the maize requirements are expected to significantly expand to cater the feed demand of livestock industries. Per capita demand of other agricultural commodities is also expected to increase. It is estimated, as earlier also referred to, that by 2020 mostly negative net trade will be seen for wheat and maize, whereas it will be marginally positive in case of rice.

Significant production increases were seen in fruits, vegetables and other commercial crops but mainly from area expansion rather than yield increase. Meat production increased almost three-folds at a rate of about 4 per cent per annum. Agricultural products and by-products constitute major source of foreign exchange earnings in most of the countries in the sub-region; the share of agriculture in Thailand's export is about 60 per cent and the Philippines agriculture accounts for 30 per cent of total exports. The GDP growth rate was recorded to be above 7.5 per cent in most of the Southeast Asian countries in 1995 and is expected to continue to increase close to 8 per cent. Agriculture sector is crucial to determine this increase as it remains the main source of income and employment.

The ratio of arable land to agricultural population deteriorated from 0.34 ha per capita in 1961 to 0.13 ha per capita in 1993 mainly to accommodate population expansion, migration, industry and development projects. Average rice yields increased from 3.0 to 5.8 t/ha in irrigated areas but in rainfed ecosystem the corresponding increase was only marginal, i.e., from 1.4 to 1.8 t/ha. The research priorities need to address fragile rainfed environments and to develop high yielding varieties that may withstand prolonged drought, temporary submergence or other common climatic stresses. NARS' research goals in the sub-region could be based on the respective country's overall development goals and on other wide ranging development considerations. Seven major research goals were identified : i) production efficiency, ii) food self-sufficiency, iii) employment generation, iv) agricultural modernization, v) global competitiveness, vi) resource conservation/sustainability, and vii) agricultural diversification.

Major commodity research areas considered by various NARS in Southeast Asia could be summarized into the following common research priorities of sub-regional importance:

1. Enhanced production and productivity in crops
 - i. Rice and maize among cereals
 - ii. Cassava, sweet potato and Irish potato among root crops
 - iii. Mungbean, peanut and soybean among legumes
 - iv. Tropical vegetables and fruits
 - v. Rubber, oil palm, coconut, tea, coffee, cacao, spices, sugarcane and tobacco among plantation crops
2. Increased production and productivity in livestock and poultry : cattle, buffalo, goat, sheep and chicken
3. Fish production (aquaculture, artisanal fisheries, deep sea fisheries)
4. Farming systems and on-farm research
5. Post-harvest technology in crops
6. Conservation and management of soil resources
7. Socio-Economic research

Some other research areas important to a few countries in the sub-region could be: agrometeorology, water resource, farm machinery, small tools development and biotechnology.

The comprehensive review of above priorities for Southeast Asia presented by Dr. William Dar provided the basis for further discussion on the categories applied for priorities. It was considered that both commodities and activities could be used. Commodities were the most readily understood, and it was accepted that these needed to be considered in a system context. There were concerns that the commodity approach failed to build in ecological issues, particularly sustainability. That meant considering commodities in terms of increasing productivity, developing appropriate production systems and management, and protecting the environment. Additionally, it was recognized that the priority accorded to respective commodities needed to relate to the extent to which they were common to all countries in the region, or common to only a few countries, or were unique to just one nation. The first category was considered to be the most important, in the context of regional considerations of importance to APAARI, as this provided the greatest opportunities for spillovers. The latter underpin eco-regional activities.

It was suggested that the real value-adding role of APAARI be spelt out, especially when the list of priorities was very large, with too many in the high priority category. Accordingly, APAARI needed to provide a collective NARS perspective on future scenario for agriculture and agri-business in the region that looked ahead for the decade and beyond.

The southeast Asian sub-region is an economically vibrant area. Hence the trade considerations would be paramount and have a great bearing on the future pattern

of rural development. The sub-region is also ahead in addressing the problems of poverty and hunger than other parts of the Asian region, except for Northeast Asia. Again, the role of the CG centres, that did not deal with cash crops, would differ from that of other players in the sub-region. It was considered important to recognize that the CGIAR priorities related to the food commodities of developing countries, whereas the agenda of NARS and APAARI was much broader and embraced many other commodities, including cash crops.

In the discussion, it was pointed out that several agricultural areas in the sub-region, other than Mindanao in the Philippines, and Borneo (Indonesia and Malaysia) remaining unexploited and sparsely populated, were being developed for plantation crops. It would, therefore, be important to develop agricultural systems for the farming community in these areas. Also, the research infrastructure should be developed to support such crops.

While recognizing the importance of maintaining the natural resource base, and of integrating production systems in an ecologically sound manner with this base, highest priority had to be accorded to increasing productivity and efficiency of production of the principal commodities. This was crucial because of the requirement to feed many additional, urban and rural people in the sub-region over the next few decades, and to eliminate poverty through income generation, which needed primary attention under the category commodities. However, due consideration should also be given to natural resource management issues and capacity building. The conservation and utilization of agrobiodiversity was seen to be extremely important. The sub-regional networks for genetic resources are presently operating somewhat independently, whereas APAARI could provide them a more collective regional perspective.

In terms of commodities, rice and corn were the priority crops throughout the sub-region. Self-sufficiency in rice remained a goal for many countries in the sub-region, as the amount likely to be traded in the future fell far short of burgeoning future demand. To coordinate research, it would be important to develop better means of linking partners together. IRRI is operating through consortia for the major rice production systems, and APAARI had noted these and alternative models that had been developed by others. NARS-NARS collaboration was of special significance, which is increasing significantly for many activities.

Maize would also continue to be of major significance across the sub-region and its importance for animal feed would increase. APAARI was already involved in TAMNET, an important network for maize, with FAO and CIMMYT. Networks such as this were of crucial importance for research in the sub-region and needed to be adopted for other commodities as well even though funding was always a problem.

It is already mentioned that there would be greater imports of wheat in the sub-region. Among other commodities, soybean mungbean and groundnut would attain increasing importance across the region. There was a crucial role for APAARI, together with NARS and AVRDC, to coordinate research on soybean and mungbean. In the more marginal areas, where the poorest communities were found, cassava and sweet

potato had high priority. As a general comment, it was considered that there was a failure to recognize the importance of the role of roots and tubers in the sub-region, particularly the growing importance of the Irish potato as a cash crop. Roots and tubers tended to be an "orphan" area in the sub-region.

Fruit and vegetable crops would be of increasing importance in southeast Asia because of trade liberalization, and rapidly expanding markets elsewhere in Asia, as well as other parts of the world. Domestic markets for these products would also expand. Apart from a definite role of AVRDC for vegetables, a clearer role should also be defined for the CG centres in this area. There was also evidence of the great potential of underutilized crops for commercial expansion in the region, and APAARI could play an important role in establishing the networks for information and research collaboration.

A wide range of major plantation crops grown in the sub-region would continue to be the major source of income for these economies. Research was, in general, adequately handled by the bodies associated with these cash commodities but they had to be considered in the context of sustainable land use system, thus influencing other commodities being considered by APAARI for the sub-region. For instance, it was pointed out that there were over 200 million ha of plantations extending from India to the western Pacific rim, that could be associated with other enterprises, including livestock production.

Livestock was seen as increasingly important for diversification of agriculture in the sub-region. As incomes increased so did the consumption of meat products. Livestock can be integrated into many agricultural systems in the diverse environments, and represent an important source of income for the poor. There is likely to be a greater focus on intensive pig and poultry production in future, and the issue of the demand of these industries for grain assumes greater importance. The ILRI does not include these in its agenda, precisely believing that the private sector can provide the necessary information. As the existing grazing systems are the cause of land degradation in some parts of the sub-region, for large ruminants, there are important issues of common property policy, relating to grazing systems, that needed to be addressed.

For fisheries, it was felt that APAARI had a definite research oriented role to play as the other regional bodies dealing with fisheries in the region tended to be development oriented. Aquaculture, particularly in fresh water environments, would become very significant in the region as also the issues concerning coastal zone management.

In the area of post-harvest and processing research, there were already sub-regional organizations dealing with some aspects, but it was felt that APAARI could assist in the distribution of information. Agroforestry was mentioned in the context of land use, and it was felt that ICRAF could play a stronger role in the sub-region. Perhaps the area could be dealt with through an interface between APAARI and FORSPA. Soil and Water issues in the sub-region could be handled through coordination between

APAARI, NARS and IBSRAM. In addition, the various CG centres dealing with commodities and resources recognized the need for proper consideration of the resource base and included this in their programmes and projects with their NARS partners and developed country institutions. The use of GIS and other modern techniques to enhance eco-regional activities by comparing agro-ecological domains needed to be further exploited.

Biotechnology was an area of special importance in the sub-region, and networks such as the Asian Rice Biotechnology Network of IRRI and the International Biotechnology Network of Rockefeller Foundation, provided good opportunities for NARS to build up their capacity. This was achieved through partnerships between CG centres, NARS and developed country institutions.

Capacity building through training was considered to be of the highest importance in the sub-region with increasing devolution of this responsibility to NARS for topics where the CG centres did not have a comparative advantage. In the case of IRRI, this was being pursued with NARS-NARS training taking place in many areas. Such "horizontal" transfer was extremely important. IRRI was increasingly confining its training to "cutting edge" topics such as biotechnology, hybrid rice technology, and GIS. It was also pointed out that the Agricultural Forum of APEC had an important training component built into it, that APAARI could perhaps exploit.

iii) *Northeast Asia*:— The base paper for the northeast Asian countries was prepared and presented by Dr. Young Sang Kim. The sub-region, comprising of China, Japan and Korea accounts for around 1.35 billion population which is above 20 per cent of the world's population. The total population in the sub-region expanded rapidly at a growth rate of 1.5 to 2.0 per cent. However, the farm population varied differentially, increasing from 685.7 million in 1970 to 841.4 million in 1990 in China but decreased in Japan and Korea due to industrialization and urbanization. Labour force employed in agriculture was also high in China (73.6 per cent) but low in Japan (14 per cent) and Korea (15.3 per cent) in 1990. Per cent farm land area to total area ranged between 9.97 in China to 21.2 in Korea, whereas farm size per household in China, Japan and Korea was only 0.49, 1.37 and 1.19 ha, respectively, as against 2800 ha in Australia and 182 ha in USA. This sub-region accounted for 40.9 per cent of total rice production in the world in 1990.

The growing population and improvement in people's livelihood call for an ever-increasing food supply in the sub-region. Farm land per capita has decreased from 0.18 ha in 1952 to 0.9 ha in 1987 and is further expected to shrink to 0.7 ha by the year 2000 in China. Japan is faced with declining self-sufficiency rates in cereals, imbalance between supply and demand in rice as well as other crops and the decreasing number of people succeeding farming activities. The Korean agriculture is characterized by a small scale family farm system, still partially commercialized with many farmers and in jeopardy as a consequence of the process of rapid industrialization and agricultural trade liberalization due to increased agricultural inputs.

The following, common research priority areas in this sub-region are identified in line with the changes in agrarian structure and the recent advent of World Trade Organization (WTO):

- i. Diversified and high quality oriented research and development of agriculture, forests and fisheries
- ii. Stable production of foodgrains
- iii. Biotechnological innovations to derive extra mileage
- iv. New technologies to improve nutrition, appearance and sanitary/health conditions
- v. Researches to meet special local and export market needs
- vi. Low input sustainable development of agriculture, forestry and fisheries compatible with the preservation of environmental resources and natural ecosystems

An overview of the status of agricultural research in People's Republic of China, Japan, and the People's Republic of Korea showed that these countries have recently restructured their NARS on the basis of individual priorities. Collectively, the three countries had 1,622 agricultural research organizations/institutions/centres with a combined budget of more than US \$ 2.5 billion, and approximately 89,000 research scientists. These resources cover agriculture, forestry and fisheries and endorse high priority to food production and food security in Northeast Asia.

Research priorities have some commonalities across countries, especially for, i) research and development on new diversified products for consumers, ii) sustainable production of quality grain crops, iii) biotechnological innovations, iv) technical support for production of crops for special local or export markets, and v) environmentally sound, sustainable production systems in agriculture, forestry, and fisheries. Beyond these overall goals, each country has specific national research goals dealing with areas specific to their conditions.

All the three countries have been carrying out research on increasing productivity, protecting the environment and preserving biodiversity. While enormous increases in crop productivity have taken place in the past three decades by massive investments in plant breeding, agro-chemicals, and extension programmes, some new approaches are being adopted to increase the efficiency of inputs. One example is the use of polyethylene film tunnels and houses to extend growing seasons. Increased labour efficiency and productivity is essential in all these countries due to declining rural populations. China in particular has made advances in hybrid rice and hybrid maize development that result in significantly higher yields. Japan has a strong emphasis on developing new systems of agriculture which take into account energy and environmental efficiencies, while improving the quality of life for farmers. Korea's efforts are more focused on crop breeding using innovative biotechnologies and on increasing the labour efficiency of production systems. Research advances in livestock are being made in all countries to provide consumers with safe and stable meat supplies.

Research on fisheries are being focused on technologies for fishing as well as improved methods of aquaculture.

In the area of environmental protection, all countries are striving to reduce the overall negative environmental impact of agricultural practices. Soil conservation and proper management of watersheds have been reviewed in China, rural environment conservation in Japan, and soil fertility management in Korea. Preserving biodiversity has higher priority in all the three countries with significant research, survey, and conservation efforts. Furthermore, Korea is the first country in Asia in developing a policy on reduction of agro-chemicals aiming to reduce pesticides and fertilizer by 50 per cent and 40 per cent respectively, by the year 2004.

It was also observed that all the countries in the sub-region were active in international collaborative research through bilateral and multilateral agreements, including support for research in the IARCs, the UN specialized agencies and countries. However, the policy and support for research and of ecological conditions, lead to suggest for greater room for collaborative work and attending to regional priorities and programmes of APAARI.

The challenges which emerged for this sub-region, include:

- socio-economic changes arising from population growth and urbanization and the resulting shift in the rural farm structure,
- market openings and international trade agreements which are considered to be essential to the industrial well-being of the sub-region/region and the comparative growth of the private sector,
- increasing emphasis on environmentally sound development, including biodiversity issues, which will eventually result in an overall social benefit in terms of both economic productivity and quality of life, and
- decentralization of government responsibilities for effective research and development for common priorities recommended for the region and increased involvement of regional and local governments with increased budget and accountability.

iv) *Pacific Island Countries*:— The base paper presented by Dr. Semisi gave a comprehensive picture of the status of agriculture and agricultural research priorities in the Pacific Island countries including Papua New Guinea. This sub-region comprises of a little over half a million square kilometer of land area and accounts for 6 million population. This could be further categorized into three main groups; i) large volcanic islands, rich in biological and physical natural resources, some with substantial mineral wealth, viz., Fiji, Papua New Guinea, Solomon Islands and Vanuatu, ii) intermediate size volcanic islands with rich soil but no mineral wealth except on off-shore, viz., Cooks Islands, Federated States of Micronesia, Tonga and Western Samoa, and iii) Atoll group with poor soils and limited resources, viz., Kiribati, Marshall Islands, Tokelau and Tuvalu and parts of some large volcanic islands. Production systems ranged from traditional farming systems to high input production systems. The traditional farming systems

have been practiced on small farms (less than 2 ha) maintained under agro-forestry system with few external inputs, minimum tillage and a varying fallow period. The system is considered good for conservation of biodiversity, environmentally sound and sustainable agriculture, covering mainly root crops, banana, coconut, various fruit trees, medicinal plants, nuts, pulses and spices. Moderate production systems focus on domestic consumption or local market like the traditional systems, whereas high input systems are mainly commercial and export oriented, e.g., ginger and sugarcane in Fiji, squash in Tonga and taro in Western Samoa. Except for a few agricultural commodities, the bulk of produce is marketed fresh in this region and the post-harvest and processing technology is lacking. Major issues and constraints that face this sub-region include, i) natural disaster including cyclones and fragile ecosystem of small islands, ii) exploitation of natural resources under economic pressure, and iii) high population growth rate with increased demands.

The research system of 15 nations surveyed showed several unique features; some countries were without a NARS, large sea distances separated nations leading to poor communications but also affected natural quarantine barriers. A relatively large donor component existed in agricultural development, if not research, in the sub-region. A substantial investment has been made so as to maintain the natural quarantine barriers and thus to prevent trade and germplasm exchange breaching these barriers. Besides, a number of active regional groupings are already infringing on agriculture. Further, the sub-region assumes special significance because of the high relative importance of fishery activities. Of the 29 activities for which priorities were noted, the high scoring ones for future activity were almost common. Those with a high score and also which could be aligned to the CG Centres' activities, networks or consortia are enlisted, as follows:

- Plantation Crops/IPGRI/via COGENT (coconut) and INIBAP
- Cereals (for non-atoll only)/IRRI, CIMMYT/rice, maize
- Pulses (for non-atoll only)/ICRISAT, IITA/pigeon pea, cowpea
- Roots and tubers/CIP, IITA, IPGRI/sweet potato, cassava, yam, taro
- Cattle (for non-atoll only)/ILRI
- Fisheries/ICLARM
- Soil resource management/IRRI/via humid eco-regional initiative?
- Agroforestry/forestry/ICRAF, CIFOR
- Biodiversity conservation/IPGRI, ICLARM
- Institution building/ISNAR/small nation problem
- Socio-economics and policy/IFPRI
- Germplasm enhancement/IPGRI, others/quarantine problems for germplasm exchange

In most of the cases listed, there have been some links with CG Centres which should be further improved, especially by taking advantage of the existing regional

groupings to disseminate information. But above all, a large obstacle to effective collaboration was thought to be the weakness (or even absence) of NARS in quite a few of the countries. This suggests that institution building would have the highest priority of all. The key IARCs for the sub-region could be ISNAR, ICLARM and IPGRI. Non CG centres were not considered specifically in this discussion but clearly AVRDC, IBSRAM and CABI can play an important role.

Good expertise in several of the high priority activities could be found in the APAARI network, such as:

- Fisheries: Throughout South and Southeast Asia
- Roots and tubers: Southeast Asia
- Coconuts: India, Thailand, Philippines, etc.
- Sugarcane: Various countries
- Research management training : Philippines, India, etc.
- Institute for conservation of agro-biodiversity: India, Indonesia, etc.

PRIORITIES FOR CG AND OTHER CENTRES

Dr. R.S. Paroda, Chairman, expressed happiness over the active participation at the senior level of most of the IARCs operating in the Asia-Pacific region in the present APAARI consultation to share their Centers' strategies for the Asia-Pacific region and also the possibilities and modalities of their collaboration with APAARI and its member countries.

Dr. J.G. Ryan presented ICRISAT's research priorities for Asia-Pacific region, and indicated that in the new medium term plan (MTP) (1998-2000) relations with NARS partners and stake holders will be further strengthened. Major portion of area and production of ICRISAT's mandate crops are located in the APAARI region. This will have a definite bearing on Center's research priorities. Twelve global research projects will address the constraints in target production systems. Broad target areas that will be addressed are: prosperity, inclusiveness, diversity, and environment. A draft conceptual outline of MTP 1998-2000 was circulated, which included a comparison of NARS and ICRISAT priorities outlined under the ICRISAT's 94-98 theme rankings, the working group's suggestions for making changes in the ICRISAT rankings based on NARS' priority rankings for various themes and new theme suggestions, for further comments by NARS. Feedback will be used to update the MTP to reflect shared vision of ICRISAT and NARS partners.

The presentation for IRRI was made by Dr. G. Rothschild. He emphasized the importance of the APAARI region that grows 90 per cent of rice in the region. Networks and consortia help in setting research agenda for next MTP, considering that IARCs do only four per cent of the entire research. IRRI's ecosystem approach to rice research has four areas: upland rice, rainfed rice, irrigated rice, and flood prone rice. More emphasis in future will be on rainfed areas. Future targets for impact are:

- a) *Irrigated rice*: increasing yield per hectare, enhancing input use efficiency, and sustaining resource base.
- b) *Rainfed rice*: developing resistance to abiotic stresses, enhancing water capture and use, maintaining natural resilience of ecosystem to pests, ensuring nutrient supply, and improving grain quality.

New research paradigms to achieve the targets include systems approach, use of new research techniques to reduce research costs (crop models, GIS, etc.), and farmer-participatory adaptive research.

Dr. T. Reeves presented the CIMMYT priorities for the region. He informed that nearly one third of the CIMMYT's resources are spent in Asia to develop sustainable maize and wheat production systems. Main emphasis will be in reducing genetic vulnerability and increasing sustainability of production. The strategies suggested for maize included:

- i. Technologies for yield increase and yield efficiency,
- ii. Selection for abiotic stress conditions, and durable resistance to diseases and pests, and
- iii. Use of apomixis in hybrid maize technologies.

And, the following strategies were suggested for wheat:

- i. Sustainable wheat production systems, especially the rainfed cropping systems,
- ii. Resistance to major diseases, and integrated crop management,
- iii. Collaboration with rice-wheat consortium, and
- iv. Breaking yield barriers.

The IPGRI presentation, made by Dr. M. Iwanga, emphasized the importance of NARS partnerships in the region. All the four sub-regions identified in Asia-Pacific, viz., South Asia, Southeast Asia, Northeast Asia, and the Pacific Island countries, have large cultural diversity affecting the plant genetic resources. Under FAO's global plan of action, a framework for international collaboration on PGR has been agreed, but mechanisms for implementation need further discussion. Since IPGRI has no field or laboratory facilities, most research is conducted by NARS partners (government organizations, NGOs, private sector, etc.). The international crop research centers and other regional institutes are also partners with IPGRI on PGR issues.

ICARDA's mandate, as presented by Dr. M. C. Saxena, was to improve the welfare of people in dry areas. Its global mandate is to work on lentil, barley, and fababean; and regional mandate shared on chickpea, bread wheat, durum wheat, and farming systems. The mandated, regional area for ICARDA being the West Asia and North Africa (WANA), a very little has been done for the Asia-Pacific region. Lentil, chickpea, fababean, wheat, and barley are grown in Asia-Pacific region, and ICARDA will orient some of its programmes to meet the needs of this region especially on lentil and chickpea.

IIMI presentation was by Dr. D. Seckler. Irrigation efficiency and conservation of water resources were main themes and the strategies included reduction in evapotranspiration losses by moving crops from hot season to cool seasons. IIMI, in collaboration with Utah State University, USA, is developing a climate and water atlas of the world on CD-ROM. The Asia maps will be ready by December, 1996 and will be sent to NARS for improvement/updating by additional data on crops, fertilizer use, etc.

Dr. Meryl Williams made her presentation for ICLARM, that addresses food security in world focusing on low-income people, and also noted with pleasure that APAARI is broadening from agriculture to include fisheries. ICLARM is developing the new MTP (1998-2000) in consultation with NARS. Emphasis will be on increased linkages with NARS through APAARI. Networks will play a major role, especially in biodiversity conservation, germplasm enhancement, training, and information exchange.

ILRI presentation was made by Dr. C. Devendra. Although based in Africa, ILRI has started giving due emphasis to Asia. ILRI's global mandate is to improve animal performance, conserve biodiversity, sustainable livestock systems, animal health improvement, and strengthening NARS. Priorities and activities were identified in consultation with partners in different regions and globally. Current efforts are in assessment of animal agriculture in Asia, and livestock improvement in upland farming systems in Southeast Asia. ILRI is still at early stages of development and needs to avail as many opportunities as possible. Emphasis will be on partnership with others, and pooling of resources.

CIP priorities were narrated by Dr. P. Gregory, that the Centre concentrates for activities on potato and sweet potato. Due to decentralization, more than 50 per cent of the CIP staff are working with partners away from headquarters. The research projects have been reduced from 36 to 19 to increase focus and target. More resources are already committed to Asia-Pacific region. Priorities for potato include resistance to late blight, viruses, and bacterial wilt; seed systems; post harvest handling; IPM for pests; and linkages with Rice-Wheat Consortium. Priorities for sweet potato include breeding for high dry matter, product development, seed systems and planting material, and insect pest management. Emphasis on training and collaborative research will continue.

Dr. Samson C. Tsou, while presenting the priorities of AVRDC, informed that it is an Asia based institute, laying 60-70 per cent emphasis on activities related to Asia. Its Mandate includes emphasis for improved nutrition, farm income, and environmental sustainability using vegetables. There are three sub-regional networks: AVNET (Southeast Asia), CLVNET (Indo-China), SAVERNET (South Asia). The networks assist in exchange and evaluation of elite lines, and specific research areas for collaboration, such as, bacterial wilt, diamond back moth control, etc. Future emphasis will be to implement CLVNET, promote inter-network interaction, improve information exchange, and create sub-networks as per the need in the region.

CABI priorities were presented by Dr. R. J. Williams. It is an inter-governmental, mission oriented, bioscience organization. There are 40 member countries, with good representation from Asia-Pacific region. CABI's mission is to assist in sustainable development by information dissemination. There is a regional centre in Malaysia, with research stations in Pakistan and Malaysia. CABI's areas of strength are: information (both printed and electronic) and bioscience services (biosystematics, reference collection. CABI shall welcome partnership with APAARI and member countries to enhance research relevance, quality, and impact.

A productive general discussion that followed the presentations and the comments by Chair, brought in some useful points related to interface between APAARI and the CG/Non-CG IARCs, and a follow-up agenda as below:

- i. CLAN network should be enlarged to include lentil (ICARDA mandate), and mungbean and soybean. (AVRDC)
- ii. A consortia or network for information exchange and knowledge sharing may have a big impact in Asia-Pacific region. (ISNAR and CABI)
- iii. Inland aquaculture needs more emphasis. Success stories in aquaculture need to be disseminated. (ICLARM) and a regional network be established.
- iv. Concerned IARCs should continue support to networks on their mandate crops. (All centres in the region)
- v. A network on conservation of agro-biodiversity in the region is a high priority. (IPGRI)

STATUS OF EXISTING NETWORKS AND FUTURE STRATEGY

Four presentations were made on the existing networks in the region, viz., TAMNET, UTFANET, CLAN and ASPRAD.

Dr. N.N. Singh, Coordinator, Tropical Asian Maize Network (TAMNET), gave a presentation on the establishment, set-up and activities of TAMNET. This network comprising of the Tropical Asian Maize growing countries was established in 1993 at the First Southeast Asian Maize Workshop sponsored by FAO and held at Thailand to cover all the multi-disciplinary research activities related to maize and its development in the region. Maize has been listed on high priority by the northeast sub-regional member NARS and is projected to be equally important at other sub-regions too due to increasing feed requirements and also human consumption.

The coordination of activity for the TAMNET is steered by the Indian NARS, its membership includes all APAARI members in the Tropical Asian region and it is supported mainly by APAARI, the FAO of the United Nations and CIMMYT.

Two major activities being carried out presently under TAMNET include, i) testing of promising varieties and hybrids of member nations in coordinated multilocation trials, and ii) publication of a half yearly Newsletter which aims to disseminate information on maize research and technologies, profiles of institutes dealing with maize research

and development in member nations, training programmes, etc. The network also addresses specific problems and requirements, such as, developing and verification of technology for the early, medium duration and full season maturity cultivars as required for different partners in the network, testing of private sector materials, etc.

Other activities that TAMNET further envisages to strengthen include, i) establishment of a database for tropical Asia, ii) release of improved inbred lines for use in the member countries, for making hybrids, through arranging funds from donors like FAO, CIMMYT, etc. iii) initiating for regular training programmes in member nations organized with the help and guidance of APAARI and CIMMYT, iv) and assisting the weaker NARS in the network.

Dr. Nazmul Haq, Director, ICUC gave his presentation on the Underutilized Tropical Fruits in Asia Network (UTFANET). Asia is the centre of diversity of many tropical underutilized fruits which are mainly grown in home gardens, managed by women folk, and have great potential to provide essential, inexpensive, supplementary nutrition and calories to the diet of poor people, generate employment, value-addition and foreign exchange earning. ICUC, in collaboration with the Commonwealth Science Council (CSC) initiated the spadework in 1993 by carrying out background survey on genetic resources, propagation and production systems, post-harvest and processing and socio-economic aspects, in collaboration with IPGRI, to identify the priority species for the region. The emerging priorities based upon survey results were further discussed with Heads of the NARS of the region which led to the emergence of UTFANET. This network started operations from 1995, with financial support from ODA, CSC, FAO, ICUC and APAARI. It mainly aimed to improve the economic and social development and nutrition of people in the region through increased production of tropical fruit tree species.

The UTFANET is governed by a Steering Committee comprising of national coordinators (nominated by NARS of the participating countries), the network coordinator (as an ex-officio member) and representatives from other support group agencies (with no voting rights). The steering committee formulates policy, develops strategic plans, approves programmes and reports to donor agencies. The national coordinators provide the in-country coordination and the primary link with the Secretariat of their representative NARS whereas representatives of support group agencies provide guidance and multilateral assistance elements to the network.

UTFANET has eight member countries of the APAARI region since inception, viz., Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam, with ICUC acting as the Executing Agency. Malaysia and Myanmar are also in the final stages of their inclusion into the Network. The agreed activities of the network include collaborative research, regional workshops/training courses, consultation meetings, monitoring and exchange of scientists.

The UTFANET Secretariat, presently located at the ICUC headquarters in Southampton, UK, provides logistic support to network activities as approved by the

steering committee, and is looking for alternative arrangements to locate the Secretariat in the region with the help of APAARI.

Jackfruit, pummelo and mangosteen were accepted by the national coordinators as priority species under the UTFANET in its first steering committee meeting in December, 1995. Its collaborative research plan consists of two sub-programmes, i) Varietal development, including genetic diversity, propagation, pollination and fruit setting and on-farm research, and ii) post-harvest technology including harvesting, processing and pilot scale testing.

A training course on Propagation and Production of Tropical Fruits funded by CSC, APAARI and ICUC and in collaboration with the Thailand NARS, was conducted by the Network in July, 1995. Another training course on Conservation Management of Tropical Fruits has been planned jointly with IPGRI to be held in India in 1997. Dissemination and exchange of Network information has been carried out through Newsletters, publication of an Annotated Bibliography of the priority species, i.e., Jackfruit, pummelo and mangosteen and development of a database.

The UTFANET is in early stage of development, drawing financial support mainly from the support group agencies without assured sustained support. No membership fees are collected. UTFANET strongly looks forward to sustained support from APAARI for funds and also for locating its secretariat in the region.

Dr. C.L.L. Gowda, Coordinator, CLAN, from ICRISAT, presented the Cereals and Legumes Asia Network (CLAN) Model. A united Cereals and Legumes Asia Network (CLAN) was launched in April 1992 involving research and technology exchange and covering activities on sorghum, pearl millet, chickpea, pigeonpea, and groundnut, and related resource management research. The overall objective of this network has been to support, coordinate, and facilitate research collaboration and technology exchange on the CLAN priority crops, their resource management among Asian NARS scientists, enhanced coordination of regional research on sorghum, pearl millet, chickpea, pigeonpea, and groundnut and development of stable and sustainable production systems.

Currently, Bangladesh, China, India, Indonesia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam constitute the core members, whereas, CLAN also responds to specific requests from other Asian countries. More than 950 cooperator scientists and administrators were willing to share research responsibilities, results, and technology from 15 countries, regional and international institutions. The network structure consists of bilateral and multilateral elements. Its Coordination Unit (CU), is based at ICRISAT Asia Centre, Hyderabad, India. It provides logistic support and facilitates implementation of planned network activities. The country coordinators provide main administrative link between the Coordination Unit of CLAN and the NARS and also within the respective NARS.

CLAN supports diverse activities in the region, such as, collaborative research work plans, exchange of germplasm and breeding material, training, information

exchange, regional workshops and meetings. Working groups are formed by a group of committed scientists having common interest in addressing to and finding solutions for the high priority regional problems identified for research in the network, such as, Asia-Pacific groundnut viruses, *Botrytis* gray mold of chickpea, biological nitrogen fixation in legumes, drought tolerance in legumes and sorghum and cytoplasmic-genic male sterility in pigeonpea.

Two surveys conducted to assess the contribution of CLAN in enhancing research capabilities of member countries, in alleviating production constraints and in increasing crop production of CLAN mandate crops in Asia, in 1989 and in 1993, have provided useful feedback and suggested changes for improvement. The CLAN Steering Committee suggested that APAARI may consider supporting the coordination of networks, in general, and consider CLAN as a sub-network.

Presentation for Asia Sweet potato and Potato Research and Development (ASPRAD) was made by its Coordinator Dr. E.T. Rasco. ASPRAD is based at PCARRD Headquarters at Manila, Philippines. It was brought that ASPRAD seeks assistance and funding from ACIAR and APAARI. The mission oriented activities of ASPRAD include identification, development and dissemination of technologies to enhance the contribution of potato and sweet potato industries to the socio-economic development of China, Indonesia, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand and Vietnam. Its activities also include research management and coordination, dissemination of information through Newsletter, Training, etc.

Over all, APAARI recognized the recent global developments in scientific research, including the fact that Networks have become increasingly important in agricultural research as means of effective and efficient use of limited manpower, facilities, and funds so as to achieve desired research and developmental goals through interaction and exchange of information, knowledge, and technology, to avoid duplication of efforts and to address and solve specific problems confronting the network members. APAARI members also considered in favour of strengthening the existing networks, as its sub-networks, or to provide support through other interested donors.

RECOMMENDATIONS

In the Plenary Session chaired by Dr. William D. Dar, the following recommendations were made:

1. The priorities identified in the base papers presented/sub-regional group discussions held and general observations/recommendations made were agreed to, in principle. However, these priorities need to be further refined so that specific bilateral and multilateral action plans could be drawn for research collaboration, information dissemination, technology transfer, human resource development, institution capacity building, etc., in the region.
2. Important common research priorities in the Asia-Pacific region, on which immediate action in partnership mode could be initiated, were identified as follows:
 - i. Improvement in the productivity of crops/commodities : cereals (rice, wheat, maize), legumes (mungbean, soybean), tropical vegetables, plantation crops, livestock (cattle, buffalo), poultry, fisheries.
 - ii. Exploitation of hybrid technology for breaking the yield barriers.
 - iii. Strengthening research on system's approach : Rice-Wheat cropping systems, cash crops based production systems - cotton, jute, sugarcane, farming systems research, agro-forestry.
 - iv. Socio-economic research and policy planning.
 - v. Strengthening research on biotechnology and biosafety measures.
 - vi. Biodiversity conservation and its on and off farm conservation, germplasm enhancement and use and the Indigenous Technology Knowledge feedback and collaboration on IPR issues for the development of a *sui generis* system on plant variety protection.
 - vii. Integrated management of natural resources; differentiating natural resources, agricultural potentials and technological opportunities.
 - viii. Seed production and seed technology.
 - ix. Post-harvest technology-processing, product development and value addition.
 - x. Integrated research on non-conventional or underutilized crops; utilization of non-conventional feed resources for better nutrition.
 - xi. Increased productivity and export potential of various livestock and their products through diagnostics, vaccine production and management of major prevalent and emerging diseases : cattle, buffalo, poultry, fisheries.
 - xii. Participatory approaches for technology assessment, refinement and transfer.
 - xiii. Strengthening regional coordination activities, information management system (improvement, accessibility, compatibility) and networks: TAMNET, CLAN, etc.
 - xiv. Strengthening of smaller NARS for their effective management through capacity building.

- xv. Agricultural human resource development through training in up-stream and new areas.
- xvi. Integrated nutrient management for important cropping systems.
- xvii. Integrated pest management.
- xviii. Genetic enhancement for biotic and abiotic stresses.
- xix. Water management with emphasis on on-farm water use efficiency.

Whereas the regional level priorities should lay more emphasis on issues like information sharing and policy, such as, harmonization of regulatory measures, viz., IPR, Biosafety, quarantine and germplasm sharing etc., the sub-regional priorities, should essentially cover commodity oriented research and technology, increase in production and productivity, farming systems, etc.

3. A comprehensive publication based on the synthesis paper as well as all the four sub-regional reports be brought out by APAARI in order to serve as base material for all concerned in the Asia-Pacific region.
4. While appreciating the working of TAMNET, it was felt that the monitoring mechanisms for the trials conducted need to be strengthened. Need for mobilizing sufficient resources was felt to further strengthen this network. CIMMYT also agreed to collaborate with FAO and APAARI and ensure its sustainable functioning.
5. A need was felt to include China also in the rice-wheat consortium since its participation would strengthen on-going research efforts on rice-wheat, the major food crops which are important for required food security in the region.
6. A network approach on coarse cereals, such as, sorghum and pearl millet and legumes including soybean, pigeonpea, lentil and mungbean was felt to be important. This would call for effective support from ICRISAT. It was also suggested that soybean, mungbean and lentil should be brought under the ambit of CLAN and association with AVRDC and ICARDA should be strengthened in order to make CLAN more effective and useful to a large number of countries in the region. Hence, modalities need to be worked out for including these crops and associate other partners for CLAN.
7. As legumes would play an important role for the sustainability of productive cropping systems in the region, it was felt that APAARI, ICRISAT, ICARDA, AVRDC, and FAO should attempt a joint proposal for possible funding by IFAD, including funding support for the Facilitation Unit, which could also enable APAARI to strengthen its Secretariat. ADB could also be approached for funding of the networks in the region.
8. Recent developments on hybrid rice in the region were noted with satisfaction and a networking approach (Hybrid Rice Task Force) with effective support from IRRI and APAARI was felt important. Materials generated by the NARS in the region and IRRI could be effectively used, through the network programmes,

for evaluation. Initiative to establish CORRA by IRRI was lauded by APAARI members.

9. The representatives of the CG Centres appreciated the efforts being made towards networking. They also agreed, in principle, to play a far greater role as facilitators for their, respective, mandated crops/commodities. In particular, more active role of IPGRI, ICLARM, ICARDA, CIP, ILRI, ICRAF, IITA, and CIAT for effective network programmes was felt at the sub-regional/regional levels.
10. A network for potato and sweet potato, on the analogy of existing network (ASPRAD), could be further strengthened in the region. This shall call for support from International Potato Centre (CIP) as well as of respective NARS interested in the development of these crops. A network for taro and yam is considered essential and be initiated on priority in the Pacific Island countries with possible support of UNDP, FAO, Pacific Island Commission (PIC) and ACIAR.
11. While considering the dissemination of information as an important requirement, it was agreed to explore the possibilities of networking of various NARS and CG Centres through active involvement of ISNAR, CABI and APAARI. Effective presence of ISNAR in the region to strengthen various NARS was considered highly crucial at this juncture so that both APAARI and ISNAR could extend needed support to all concerned.
12. The objectives and the activities of APAARI were whole-heartedly supported by the representatives of FAO, IFAD, World Bank and the CG Centres. They also expressed willingness to extend all possible support to this regional forum. It was agreed, in principle, that based on the priorities identified, a few regional projects should be formulated in a collaborative mode (NARS-CG Centres-APAARI) and submitted to various donors for funding.
13. The real value-adding role of APAARI was required to be spelt out, especially when the list of priorities was very large, with too many in the high priority category. Accordingly, APAARI's action plan needed to provide a collective NARS perspective on future scenario for agriculture and agri-business in the region, looking ahead towards the next decade and beyond. Required cumulative mechanisms to ensure fulfilment of this objective will have to be put in place at the earliest.

PART-II

FOURTH GENERAL ASSEMBLY OF ASIA PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS (APAARI)

November 26, 1996, New Delhi

OPENING OF THE FOURTH GENERAL ASSEMBLY

The Fourth General Assembly of the Asia Pacific Association of Agricultural Research Institutions (APAARI), organized by the ICAR and jointly sponsored by the FAO of the United Nations, ISNAR and ACIAR, was held on November 26, 1996 at IARI, New Delhi, India, in conjunction with the APAARI Expert Consultation on Research Priority Setting by the NARS in the Asia-Pacific region and NARS-CGIAR Partnership. The Heads and senior level representatives of NARS from member countries and others, viz., India, Pakistan, Nepal, Australia, Japan, Korea, Iran, Western Samoa, Fiji, Papua New Guinea, Philippines and Thailand and representatives of associated member institutions, viz., ICRISAT, ISNAR, CIMMYT, IRRI and ICARDA and resource persons from Indian NARS participated in the General Assembly.

The General Assembly was chaired by Dr. William D. Dar, Chairman APAARI and Dr. R.S. Paroda, Executive Secretary, APAARI, detailed various Agenda items to the participants. The final agenda, as adopted by the Fourth General Assembly and the list of the participants are appended (Annexures-I(b) and II(b), respectively). Item by item deliberations held, observations made and decisions taken are as follows:

AGENDA ITEM 1 : WELCOME AND ADOPTION OF THE AGENDA

Dr. William D. Dar, Chairman, while welcoming the members and other invitees/participants, noted with appreciation that despite long travelling and their other important responsibilities, they made it possible to attend the Fourth General Assembly of APAARI. He further expressed his pleasure over an overwhelming participation that reflected the faith of member countries and other interested parties in APAARI and also the proud ownership of this regional Forum. He lauded the good initial work done by APAARI for the region and saw a bright future for the Association in serving the region and in establishing close linkages among NARS, between NARS and CG Centres and with other interested regional and international organizations. He then requested Dr. R.S. Paroda, Executive Secretary, to introduce the agenda items.

Dr. R.S. Paroda pointed out to the participants of the Fourth General Assembly to recall that the APAARI Executive Committee in its last meeting held at New Delhi on 3rd February, 1996, following the Expert Consultation on NARS-CGIAR partnership had recommended certain specific activities to be taken during the year, so as to

bring out a better visibility, exchange of information, and also providing the much needed support to the member countries. Item by item progress made was presented including the action taken to organize an Expert Consultation on Research Priority Setting by the NARS in the Asia Pacific region in conjunction with the Second International Crop Science Congress to be held at New Delhi. The General Assembly greatly appreciated the support from FAO, ISNAR and ACIAR, which made possible this Expert Consultation.

AGENDA ITEM 2 : ACTION TAKEN REPORT

The Fourth General Assembly also appreciated the appropriate actions taken on all the recommendations made at the Third General Assembly held in 1994. The important tasks accomplished during this period were noted as follows :

- i) *Continuation of Newsletter*:— APAARI brought out two successful issues of its Newsletter, i.e., the December,'95 and June,'96 issues, following the recommendations of the February,'96 meeting. These issues were well received by the member countries, particularly for the coverage on 'Institute Profile', which highlighted the research achievements and activities of the PGR related institutions of the Japanese and the Indian NARS. The General Assembly acclaimed a good beginning of this Newsletter to facilitate free flow of information among the member countries and affirmed that the APAARI Newsletter should continue.
- ii) *Publication of Directories of NARS Institutions*:— The Directory of South Asia has already been published and circulated widely. The work on the Directory of Southeast Asia, with the help of PCAARD, is in the final stage, and is expected to be received soon. The Directory of Pacific Island countries shall be prepared with the help and support of ACIAR, for which Dr. Clements was requested to extend support.
- iii) *Publication of Success Stories*:— Success story on Transformation of Korean Farming through effective research and extension linkages in the Republic of Korea was formally released by Dr. William D. Dar, Chairman, APAARI and distributed to all the participants of the Fourth General Assembly. Dr. Paroda also informed that the second success story in the series for 1996, on Cotton Production in Pakistan, has been cleared by the authors after its editing and is in Press. Further, the manuscript for success story on 'Orchids in Thailand' was also received and is being processed. He also hoped that the rest of the Success Stories of other NARS recommended for publication during 1996 were under preparation and requested that these should be submitted soon for editing and publication in near future. Dr. Kim from Korea, in his thanks giving remarks, appreciated the opportunity given to him to say a few words at the release of the Korean Success story. He liked the get-up of the booklet and showed his desire that its additional copies be provided to him, on cost basis, for use by RDA.

iv) **Preparation of NARS-CGIAR Partnership Action Plan:**— A comprehensive exercise on research priorities in the APAARI region, on a sub-regional basis, was undertaken and the four sub-regional reports pertaining to South Asia, Southeast Asia, Northeast Asia and Pacific Island countries were prepared by the identified resource persons. Dr. William D. Dar, Chairman, APAARI, as the nodal person, synthesized these reports and the 'Synthesis Paper on Agricultural Research Priorities for the Asia-Pacific region' along with other sub-regional reports, was circulated as the Secretariat Paper for discussion in the Expert Consultation on 'Research Priority Setting by NARS in the Asia-Pacific region'. The APAARI General Assembly recommended to bring out a comprehensive publication out of all the sub-regional reports and the synthesis report.

AGENDA ITEM 3a : EXPERT CONSULTATION ON NARS-CGIAR PARTNERSHIP

Dr. R.S. Paroda, Executive Secretary, APAARI briefed the Fourth General Assembly about the Expert Consultation on NARS-CGIAR Partnership that was held at New Delhi on February 1-2, 1996. He informed that the Consultation was attended by the heads of twelve National Agricultural Research Systems, besides Director Generals of four CG Centres, senior representatives from the World Bank and ICAR. The FAO, IFAD, ISNAR and ACIAR extended funding support to organize this Expert Consultation. The General Assembly recorded high appreciation for this support and also for Dr. R.S. Paroda for the sincere efforts made by him, both as Executive Secretary, APAARI and as Head of the Indian NARS that provided the venue and other organizational support for the Expert Consultation.

Dr. Paroda told that in this Expert Consultation APAARI endorsed the CGIARs' priority areas as reflected in its major objectives, viz., alleviation of poverty, enhancing food security and sustaining the resource base for agricultural research within the Asia-Pacific region. APAARI is now being considered as a competent regional forum capable to motivate and help member countries in the region to develop commonly shared views on regional research priorities and also to recommend to the CG and other centres as well as interested donors to extend technical and financial support to member NARS on identified common/specific priorities. The Secretariat Paper entitled 'APAARI's Vision Towards NARS-CGIAR Partnership', prepared by Dr. R.S. Paroda, was duly endorsed by APAARI and the Expert Consultation. It was also decided to hold another consultation on the regional and sub-regional research priority setting following the Second International Crop Science Congress at New Delhi. APAARI also recommended that the sub-regional research priorities relating to the four APAARI sub-regions should be compiled by designated resource persons followed by their synthesis for the region by Dr. William D. Dar, Chairman, PCAARD.

Dr. R.S. Paroda informed the General Assembly that the Proceedings of the Consultation have already been published and circulated to all concerned, which included *inter alia* the tabulated list of priorities and the secretariat paper which, he hoped, shall be thoroughly referred to in future to collate, finalize and endorse the regional vis-a-vis APAARI priorities. This was cheered by the General Assembly with an applause.

AGENDA ITEM 3b : CONSULTATION ON RESEARCH PRIORITY SETTING BY NARS IN THE ASIA-PACIFIC REGION

The General Assembly greatly appreciated the excellent outcome of the just concluded Expert Consultation on 'Research Priority Setting by NARS in the Asia-Pacific region' held at New Delhi on November 25-26, 1996 that would help APAARI to crystallize further areas of research priorities and collaborative approach to strengthen NARS-CGIAR partnership as brought out as part I of the proceedings.

The General Assembly felt it useful to identify priorities both at the regional and sub-regional levels. Whereas the regional level priorities shall include issues like information sharing and policy, such as, harmonization of regulatory measures, viz., IPR, biosafety, quarantine and germplasm sharing, the sub-regional priorities, on the other side, would lay more emphasis on commodity oriented research and technology, increase in production and productivity, farming systems, etc. The General Assembly suggested the NARS leaders to critically go through the sub-regional documents prepared by the four consultants and send their additional comments, if any, to the APAARI secretariat latest by February 15, 1997. All the authors were also requested to suitably revise their reports and submit by February end for collective editing and publication as a joint APAARI document.

The General Assembly was of the view that APAARI should be effectively represented at the ICW meetings of the CGIAR. The CGIAR, on its part, should continue to keep NARS-CGIAR partnership as a standing agenda item on which the regional fora should make a detailed presentation. This alone could provide opportunities to the regional fora to identify areas of common interest leading to inter-regional and global linkages on selected items of priority. The Fourth General Assembly, also recorded the paucity of resources available with APAARI and that it would appreciate if participation of its Chairman and Executive Secretary is supported by CGIAR in the MTM and ICW meetings. The official invitation for these meetings should be extended well in advance to APAARI and other regional fora so that they come literally prepared with documents on the respective agenda items related to them.

AGENDA ITEM 4 : MEMBERSHIP AND FINANCIAL STATUS

a) *Membership:-* The existing national membership of APAARI is 19. The General Assembly expressed concern over the New Zealand's decision to discontinue membership of APAARI from 1996, but noted with satisfaction the Secretariat's efforts in taking up the matter with their nodal institution, persuading and bringing out the importance of the continuance of New Zealand's membership. Efforts are also on to encourage China and Indonesia to join APAARI as members to boost the research initiatives in the region. Chairman, APAARI was requested to follow-up the matter with China, as he was supposed to meet the concerned officials shortly. It was informally learnt that China is willing to become an effective member from 1997 but desired to have the arrears of membership fee condoned. In this context, the General Assembly also noted that help could be sought from the FAO's Deputy Regional Representative

presently posted at Bangkok, who is a former senior Chinese official, and could kindly agree to mediate. Vietnam had agreed to join APAARI from 1996 but their membership dues have not been received so far in spite of reminders. This needs to be pursued.

The General Assembly welcomed the decision of ICLARM to join APAARI as an Associate Member. It urged that ISNAR may also join APAARI as Associate Member in view of its expected role in the region and its long association with this regional forum. The General Assembly was pleased to see Bhutan participating for the first time, in the capacity of an observer, through Mr. Sherub Gyaltsen and Mr. T.R. Gurung. Mr. Gyaltsen was urged to consider Bhutan joining APAARI during 1997.

The Fourth General Assembly of APAARI also affirmed to continue its ongoing efforts urging other NARS in the region to join it in the regional interest.

The General Assembly endorsed the enhanced levels of Membership fees, as follows, for the three categories, as recommended in the last meeting of the Executive Committee.

Category-I	US \$ 10,000	Australia, China, India, Japan, New Zealand, Republic of Korea and possibly Malaysia, Thailand and Philippines
Category-II	US \$ 6,000	Bangladesh, DPR Korea, Indonesia, Iran and Pakistan
Category-III	US \$ 3,000	Remaining countries in the region.

The General Assembly urged Member Countries to extend their formal agreements on the revised membership fees. The Executive Secretariat would look into a suitable follow-up.

The General Assembly also recorded that the above grouping is only suggestive in nature and the countries in category II and III shall be encouraged to move up to higher categories. It appreciated the initiative taken by the People's Republic of Korea for having, on its own, moved from Category-II to Category-I since 1995. The General Assembly appreciated similar initiatives taken by Pakistan (Dr. C.M. Anwar Khan) and Papua New Guinea (Dr. Wyi) as both had volunteered to move up by one category each to Category I and II, respectively. Dr. William. D. Dar also agreed to move upward the category of PCAARD membership to Category I from 1997.

The representatives of India, Australia, Japan, People's Republic of Korea, Iran, and all others present, agreed to pay enhanced contribution effective from 1997. The General Assembly urged the developed and nearly-developed countries in the region to provide additional funds specifically for selected research and human resource development activities.

b) Payment :- The General Assembly was pleased to note that most of the member countries have paid their dues up to 1996, except for Bangladesh, Iran, Nepal, Papua New Guinea, Philippines (BAR), People's Republic of Korea, Vietnam and Western Samoa (Annexure-III). Accordingly, all members present were requested to pay their dues to ensure a smooth flow of funds enabling APAARI to carry out its activities/ programmes more effectively.

c) **Financial Status** :- The audited accounts for the year 1994 and 1995 were circulated and endorsed in the last Executive Committee meeting. The Executive Committee had also reviewed and approved the revised budget for the year 1995-96. The Summary Statement of APAARI budget and a Comparative Statement for budget and actuals used during the period 1st January to 31st October, 1996, were presented and are enclosed as Annexures IV(a) and IV(b), respectively. The Fourth General Assembly approved the Accounts and appreciated the efforts of the Executive Secretariat in judiciously managing the funds of APAARI. The Assembly also agreed that the Audited Accounts for 1996 shall be presented in the next Executive Committee meeting for approval in principle.

AGENDA ITEM 5 : ACTION PLAN FOR 1997-98

The General Assembly approved that the following activities shall be undertaken during 1997-98.

- Continued publication of the APAARI Newsletter. The Members were urged to give their input to the secretariat for this publication on a regular basis.
- The Directorates for Southeast Asia and Asia Pacific countries be brought out with help and support from PCAARD and ACIAR, respectively.
- Success stories on the following topics be published as already recommended and additional stories should be proposed by respective NARS and identified/recommended by APAARI for future publication.
 - Cotton Production in Pakistan
 - Orchids in Thailand
 - Wheat Production in Iran
 - Direct-seeded Rice under irrigated conditions in Malaysia
 - Agro-tourism in Australia

The General Assembly was again assured that the success stories for which write-ups were already submitted, shall be edited and published by early 1997. The General Assembly also endorsed the recommendation of the last Executive Committee meeting regarding entering the APAARI information into the Internet and other compatible databases so that it could be accessed by all nations. ISNAR should be approached for opening of a 'home page for APAARI' on Internet for benefit of all concerned.

On the strengthening of information management capacity of APAARI, the secretariat was urged to prepare a background note for consideration by the next meeting of the Executive Committee. Support of ISNAR and CABI was considered important in getting this network established. Both these organizations agreed to work out modalities to address this requirement and extend required support.

The General Assembly affirmed that the network support may continue to be provided to CLAN (instead of FLCGNET), UTFANET, TAMNET and Rice-Wheat Consortium. It was suggested that the scope of CLAN be expanded to include lentil,

soybean and mungbean through involvement of ICARDA and AVRDC. Besides ICRISAT, and IFAD/ADB be approached for possible funding support including that for the APAARI summit. Some support should also be provided to ASPRAD and the Network on root crops for Pacific Island countries. Dr. William D. Dar was requested to oversee and implement for ASPRAD in the transition period for ASPRAD. The nature and magnitude of the support for the respective networks, with the concerned officials of these networks, be worked out by the Executive Secretary, APAARI and the need based commitments be made within the allocated budget. The information to this effect could be submitted in the next meeting of the Executive Committee for formal approval. Considering the pre-eminent place of the Asia-Pacific region in the World, in aquaculture research, development and production, the General Assembly suggested that ICLARM may also establish an Asian Council on aquaculture on the same lines as CORRA by IRRI. APAARI should then support such an initiative in the region.

An Expert Consultation on Research Management Mechanisms of NARS, their strengths and opportunities should be organized in conjunction with the Fourth Executive Committee meeting to be held in Iran during October, 1997. The details of the Expert Consultation should be chalked out by the secretariat in close consultation with the host country, Iran. Timely preparation of the background paper(s), outlines of NARS and other presentations should be ensured by the secretariat.

AGENDA ITEM 6 : PROGRAMME BUDGET FOR THE BIENNIUM 1997-98

The General Assembly approved the budget proposal for the year 1997 and 1998 (Annexure V), with the following stipulation :

A budgetary provision of \$ 1,25,000 and \$ 1,50,000 be made for supporting the agreed networks during the year 1997 and 1998, respectively. The budget statement is revised accordingly and presented in Annexure VI.

The General Assembly considered the suggestion offered by the Director-General ISNAR, in his letter to other CG centres suggesting that each of the centres officially recorded on the programmes of APAARI should make a financial contribution of (say) US \$ 3,000 per annum and found that doing so would amount to be a good gesture on part of the IARCs. The General Assembly recommended that the APAARI Secretariat should seek formal agreement of the concerned IARCs. An alternate mechanism of receiving 'token' contributions from CGIAR/IARCs was also suggested to be explored. In addition, the General Assembly noted that, IFAD would be willing to fund some of the APAARI activities in the region. To this effect, the APAARI Secretariat shall work out mutually agreed upon activities and put up a proposal for funding from IFAD. ACIAR was also urged to support the initiatives, specifically in the Pacific Island countries, particularly towards establishment of root crops (taro) network. Financial assistance for the APAARI Expert Consultation may also be sought from FAO, ISNAR, ACIAR, IFAD and other interested donor organizations.

AGENDA ITEM 7 : THE FIFTH GENERAL ASSEMBLY

The Fourth General Assembly gratefully accepted the invitation of Republic of Korea to host the Fifth General Assembly in December, 1998. APAARI members were also overwhelmed by the invitation of the Pacific Island countries to host the Sixth General Assembly in 2000 in one of the countries of that sub-region, preferably Papua New Guinea. In view of distances involved, all member countries were to be invited and support of FAO, CGIAR, ACIAR and IFAD may be sought for this purpose.

APAARI appreciated earlier support of FAO for organizing these General Assemblies and hoped to receive similar support in future as well. Other donors, including ADB, could also be approached.

AGENDA ITEM 8 : ELECTIONS TO THE EXECUTIVE COMMITTEE FOR 1997-98

The General Assembly elected the following Executive Committee for the biennium 1997-1998, effective January 1, 1997.

Chairman	:	Pakistan	(Dr. M. Akbar)
Vice-Chairman	:	Japan	(Dr. Nobuyoshi Maeno)
Members	:	Bangladesh	(Dr. M.S.U. Chowdhury)
		Thailand	(Dr. Vichitr Benjasil)
		Fiji	(Dr. J. Kumar)
		Philippines	(Dr. William D. Dar)
Executive Secretary	:	India	(Dr. R.S. Paroda)

The General Assembly greatly appreciated the outstanding leadership provided by the outgoing Chairman, Dr. William D. Dar (Philippines) and other members of the Executive Committee. In particular, it lauded the dynamism and valuable contributions made by Dr. R.S. Paroda, Executive Secretary, and requested him to continue to serve APAARI in the same capacity. Both Dr. William D. Dar and Dr. R.S. Paroda worked hard to activate various APAARI programmes and bring required visibility of the organization, and its recognition by the CG system. APAARI also congratulated the new Executive Committee members and wished for all the success. All members particularly requested Dr. William D. Dar to continue extending his active support to APAARI as member of the new Executive Committee.

AGENDA ITEM 9 : ESTABLISHMENT AND STRENGTHENING OF THE APAARI SECRETARIAT

The General Assembly recalled that since inception, the Secretariat of APAARI has been functioning from FAO regional Office at Bangkok, Thailand through generous support extended by FAO. Earlier, the Executive Secretary was also provided by FAO. However, such support has gradually been reduced and in view of financial constraints,

FAO may not be able to extend services of its staff for looking after various functions of the APAARI Secretariat, including its Executive Secretary.

The Fourth General Assembly discussed several options for strengthening the APAARI secretariat and suggested that for the time being the present arrangements may continue. FAO regional Office for Asia and the Pacific (RAP) may be requested to continue to provide the space and other logistic support, including the official time of Mr. P.K. Saha on the existing basis. Mr. Saha's contribution to APAARI activities was considered very critical at this stage and his support to APAARI Secretariat in Bangkok was also appreciated widely. The Fourth General Assembly further resolved to urge the Assistant Director General, FAO, Mr. A.Z.M. Obaidullah Khan at RAP office, to allow continued assistance of Mr. Saha to APAARI as well as logistic support and funding of APAARI Secretariat from his RAP office.

Dr. R.S. Paroda, Secretary DARE and Director General, ICAR, was persuaded by the General Assembly to continue as Executive Secretary despite his heavy responsibilities, since same was considered critical for sustainability of APAARI. The General Assembly also authorized Dr. Paroda to engage a full time consultant/technical assistant so as to assist him in discharging his duties of the Executive Secretary.

It was also noted with satisfaction that Mr. Peter Roseneger, FAO Representative in India and his office staff, particularly Ms. Renuka Taimini, have extended good support for the Secretariat activities of APAARI, including small office space, and the General Assembly resolved to thank the Director General, FAO, Rome as well as Mr. Roseneger and requested them to continue extending similar support to APAARI in future as well.

The Fourth General Assembly again placed on record its appreciation to Dr. William D. Dar, the outgoing Chairman, for his excellent leadership and wished that his continued support be available in future as well.

The General Assembly honoured Dr. C. Bonte-Friedheim, Director General, ISNAR for his valuable support to APAARI and presented him with a memento as he was about to complete his assignment with ISNAR.

The members of outgoing Executive congratulated the new Executive Committee members and wished that APAARI attains newer heights during 1997-98 under their leadership with a consistent input of Dr. R.S. Paroda, its continuing, dynamic Executive Secretary.

The Fourth General Assembly ended with a resolution to provide all possible support to APAARI and with a vote of thanks to the chair.



**ASIA-PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS
(APAARI)**

**EXPERT CONSULTATION ON RESEARCH PRIORITY SETTING
BY NARS IN THE ASIA-PACIFIC REGION**
(Co-Sponsored by FAO, ISNAR and ACIAR and organized by ICAR)
November 25-26, 1996, New Delhi

PROGRAMME

November 25, 1996 (Monday)

INAUGURAL SESSION

	Chairman	:	Dr. Ismail Serageldin, Chairman, CGIAR	
	Chief Guest	:	Shri Chaturanan Mishra, Union Agriculture Minister, Government of India	
0900-0910	Welcome and Objectives of the Expert Consultation			R.S. Paroda
0910-0920	APAARI Chairman's Address			William D. Dar
0920-0930	Opening Address			Peter Rosenegger
0930-0945	Chairman's Address			Ismail Serageldin
0945-1005	Inaugural Address			Chaturanan Mishra
1005-1010	Vote of Thanks			R.B. Singh
1010-1030	COFFEE/TEA BREAK			

SESSION - I : RESEARCH PRIORITY SETTINGS FOR THE ASIA-PACIFIC REGION

Chairman : Michel Petit

Rapporteur : R.S. Paroda

- 1030-1050 Research Priorities for the Asia-Pacific region – A Synthesis William D. Dar
- 1050-1110 TAC Vision for Research Priorities in TAC Representative the Asia-Pacific region J.G. Ryan
- 1110-1130 Selected Policy and Management Issues for Improved Agricultural Research in the APAARI region C. Bonte-Friedheim
- 1130-1300 Responses from NARS Leaders and Discussion
- 1300-1400 LUNCH

SESSION – II : SUB-REGIONAL RESEARCH PRIORITIES AND FUTURE STRATEGY

GROUP DISCUSSIONS

1400-1800	<u>GROUP</u>	<u>SUB-REGION</u>	<u>CHAIRMAN</u>	<u>FACILITATOR</u>
	A	South Asia	Tim Reeves	R.B. Singh
	B	Southeast Asia	G. Rothschild	William D. Dar
	C	Northeast Asia	C. Bonte-Friedheim	Young Sang Kim
	D	Pacific Island countries	Tony Fischer	S.T. Semisi

2000 DINNER hosted by APAARI
(Le' Meridien Hotel)

November 26, 1996 (Tuesday)

SESSION – III : PRIORITIES OF CG AND OTHER CENTRES IN THE REGION

	Chairman	:	R.S. Paroda
	Rapporteur	:	C.L.L. Gowda
0830-0845	ICRISAT	-	J.G. Ryan
0845-0900	IRRI	-	George Rothschild
0900-0915	CIMMYT	-	Timothy Reeves
0915-0930	IPGRI	-	Masa Iwanga
0930-0945	ICARDA	-	Mohan C. Saxena
0945-1000	IIMI	-	David Seckler
1000-1020	COFFEE/TEA BREAK		
1020-1035	ICLARM	-	Meryl J. Williams
1035-1050	ILRI	-	C. Devendra
1050-1105	CIP	-	Peter Gregory
1105-1120	AVRDC	-	Samson C. Tsou
1120-1135	CABI	-	Robert J. Williams
1135-1200	Discussion		

SESSION – IV : EXISTING NETWORKS – PRESENT STATUS AND FUTURE STRATEGY

	Chairman	:	Abbas Keshavarz
	Rapporteur	:	J. Kumar
1200-1215	TAMNET	-	N.N. Singh
1215-1230	UTFANET	-	Nazmul Haq
1230-1245	CLAN	-	C.L.L.Gowda
1245-1300	ASPRAD	-	Eufemio T. Rasco
1300-1315	Discussion		
1315-1400	LUNCH		

PLENARY SESSION

Chairman : William D. Dar

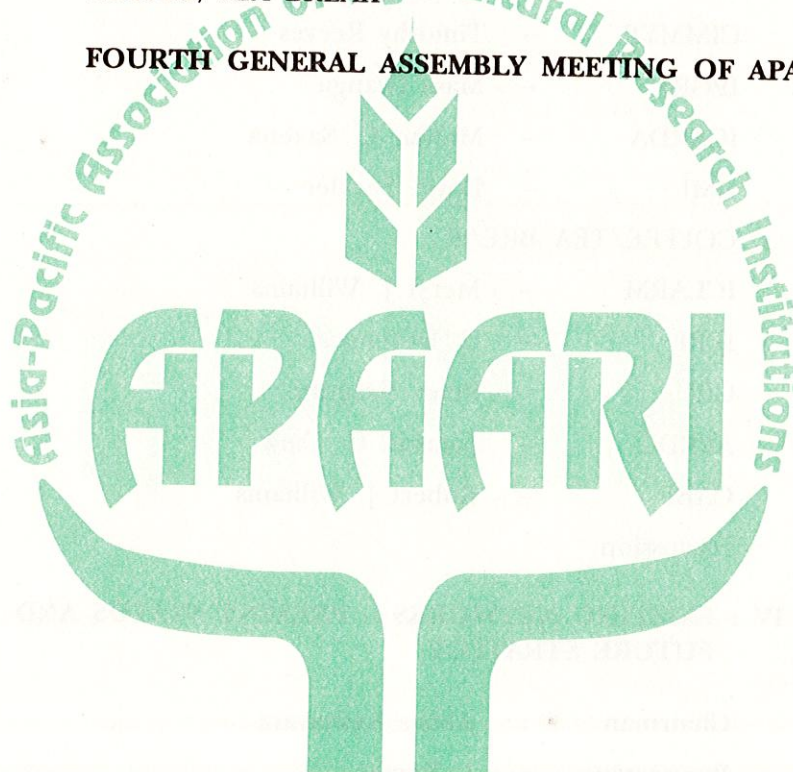
Rapporteur : R.B. Singh

1400-1500 Groupwise Presentation of Recommendations

1500-1530 Discussion and Finalization of the Report

1530-1600 COFFEE/TEA BREAK

1600-1900 **FOURTH GENERAL ASSEMBLY MEETING OF APAARI**





**ASIA-PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS
(APAARI)**

FOURTH GENERAL ASSEMBLY MEETING

November 26, 1996, New Delhi

1. AGENDA

1. Welcome Address by the Executive Secretary and Introduction of the Agenda
2. Action Taken Report
3. APAARI Expert Consultation on :
 - A. NARS - CGIAR Partnership
 - B. Research Priority Setting by NARS in the Asia-Pacific region
4. Membership and Financial Status
5. Action Plan for 1997-98
6. Programme Budget for 1997-98 : Review and Approval
7. The Fifth General Assembly - Modalities and Venue
8. Election of the Chairman, Vice-Chairman and the Executive Committee for 1997-98
9. Establishment of the Secretariat of APAARI
10. Any other item with the permission of the Chair

2. ACTION TAKEN REPORT

As a follow-up action on the Expert Consultation on NARS-CGIAR Partnership, the Executive Committee in its last meeting held at New Delhi on 3rd February, 1996, unanimously decided certain specific activities to be undertaken during 1996. These activities envisage a better visibility, exchange of information, besides providing the much needed support to the member countries in the Asia-Pacific region.

The minutes of the Executive Committee meeting are placed among the background documents for the meeting.

i. **Continuation of Newsletter** :- APAARI has successfully brought out two issues of the Newsletters, i.e., December,'95 and June,'96, as per the deliberations held in February,'96. These issues were well received by the member countries, especially the "Institute Profile", which highlights the research achievements and activities of a particular institution of a member country. It is felt that this Newsletter is a good beginning and this endeavour should continue to facilitate free flow of information among the member countries.

The June,'96 issue of the Newsletter is also placed among the background documents for kind perusal of the members.

ii. **Publication of Directories of NARS Institutions** :- Pursuant to the recommendation of the last Executive Committee to bring out the Directory of National Agricultural Research Institutions of South Asia, Southeast Asia and Oceania, the Directory of South Asia has been published. The work on the Directory of Southeast Asia is in the final manuscript stage and is expected to be received soon. As for the Directory of Oceania, the preparatory work is in progress, through the support of ACIAR.

iii. **Publication of Success Stories** :- As a follow-up of the last Executive Committee's decision to publish a few more success stories, the one on "Cotton Production in Pakistan" and "Research and Extension Linkages in the Republic of Korea" have already been published and are available for circulation. Rest of the success stories are under preparation and it is hoped that these would be out in the near future.

iv. **Preparation of NARS-CGIAR Partnership Action Plan**:- A comprehensive exercise on research priorities on a sub-regional basis was undertaken and the four sub-regional reports pertaining to South Asia, Southeast Asia, Northeast Asia and Pacific Island countries were prepared by the identified resource persons. Dr. William D. Dar, Chairman, APAARI and the nodal person for this exercise has synthesized these reports and the final document, entitled, "Synthesis Paper on Agricultural Research Priorities for the Asia-Pacific region" is being circulated as the Secretariat Paper for discussion in the Expert Consultation on "Research Priority Setting by NARS in the Asia-Pacific region".

3A. EXPERT CONSULTATION ON NARS-CGIAR PARTNERSHIP

A Consultation on NARS-CGIAR Partnership was held at New Delhi on February 1-2, 1996. The Consultation was attended by the Heads of twelve National Agricultural Research Systems, besides Director Generals of four CG Centres, senior representatives from the World Bank, FAO, IFAD and ICAR.

In this Consultation, APAARI endorsed the CGIAR's major objectives of alleviating poverty, enhancing food security and sustaining the resource base for agricultural

research within the Asia-Pacific region. It was felt that APAARI could function as a suitable forum at which member countries in the region develop a shared view on regional priorities for the active consideration by the CGIAR. APAARI also endorsed the secretariat paper prepared by Dr. R.S. Paroda, entitled "APAARI's Vision Towards NARS-CGIAR Partnership" and decided to continue the efforts on priority setting mechanisms in the Asia-Pacific region through another consultation on the subject.

The Proceedings of the Consultation are at Item No. 2 of the background document for kind information of the members.

3B. CONSULTATION ON RESEARCH PRIORITY SETTING BY NARS IN THE ASIA-PACIFIC REGION

The Expert Consultation on "Research Priority Setting by NARS in the Asia-Pacific region" to be held at New Delhi on November 25-26, 1996 shall crystallize further areas of priority for collaborative research in which NARS-CGIAR partnership could be further strengthened. This Consultation is scheduled to be held in conjunction with the 2nd International Crop Science Congress (ICSC), so as to enable members to also participate in this important event.

4. MEMBERSHIP AND FINANCIAL STATUS

A. MEMBERSHIP :

The total membership of APAARI at present is 18. Unfortunately, New Zealand has decided to discontinue its membership from 1996. The matter has been taken up with their nodal institution persuading and bringing out the importance of the continuance of New Zealand's membership. Similarly, efforts are on to encourage China and Indonesia to join APAARI as members, to boost the research initiatives in the region. Vietnam had agreed to join APAARI from 1996 but their membership dues have not been received so far in spite of reminders.

A letter received from Dr. C. Bonte-Friedheim suggesting financial contribution to APAARI by CG Centres is placed among the background documents for kind information of members.

It is also brought to the notice of the members present that International Centre for Living Aquatic Resources Management (ICLARM) is one of the CG Centres, with its headquarters located at Philippines, which have shown keen interest to join APAARI as an Associate Member.

B. PAYMENT :

Most of the member countries have paid their dues up to 1996, except for Bangladesh, Iran, Nepal, Papua New Guinea, Philippines (BAR), Republic of Korea, Vietnam and Western Samoa. The members are kindly requested to pay the dues for the smooth

flow of funds to enable APAARI to carry out its activities effectively. A statement showing the current status of payment of membership as on October, 1996, is placed at Annexure-III.

C. FINANCIAL STATUS :

The audited accounts for the year 1994 and 1995 were circulated in the last Executive Committee meeting. The Executive Committee also reviewed and approved the budget for the year 1995-96. The summary statement of accounts for the period ending 31st October, 1996 along with a comparative statement between budget and actuals used during the period 1st January to 31st October, 1996 are enclosed at Annexure IV(a) and Annexure IV(b) respectively, for kind perusal of members.

5. ACTION PLAN FOR 1997-98

The various activities to be initiated during 1997-98 are to be discussed and approved. These activities relate to :

- Publication of Newsletter
- Success Stories
- Directories
- Other Technical Reports and
- Support to important Networks as well as planning for Expert Consultations to be held in future.

Suggestions of Members are invited in this regard.

6. PROGRAMME BUDGET FOR THE BIENNIUM 1997-1998

The Statement of Budget proposed for the year 1997 and 1998 may please be perused at Annexure V for discussion, suggestions and approval.

7. THE FIFTH GENERAL ASSEMBLY

The Executive Committee, in its last meeting in February, '96, decided to organize the Fifth General Assembly, along with an "Expert Consultation on Research Management of NARS - Strengths and Opportunities " at Tehran, Iran in October, 1997. All member countries would be invited and support of ISNAR, FAO, ACIAR and IFAD is being sought for this purpose.

Suggestions relating to the proposed Consultation are invited, including donor support and also the potential participants.

8. ELECTIONS TO THE EXECUTIVE COMMITTEE FOR 1997-98

Elections to the Executive Committee for 1997-98 are due. However, the new Executive Committee is to be elected from among the full members of APAARI.

The composition of the present Executive Committee is as under :

- Chairman : Dr. William D. Dar (Philippines)
Vice-Chairman : Dr. Abbas Keshavarz (Iran)
Members : Dr. Md. Sharifbin Ahmad (Malaysia)
Dr. Jagdish Chandra Gautam (Nepal)
Dr. Young Sang Kim (Korea)
Dr. S.T. Semisi (Western Samoa)
Executive Secretary : Dr. R.S. Paroda (India)

Members are requested to elect the new Executive Committee for 1997-98.

9. ESTABLISHMENT OF THE SECRETARIAT OF APAARI

Since inception, the Secretariat of APAARI is functioning from FAO regional Office at Bangkok, Thailand through generous support extended by FAO. Earlier also, the support for Executive Secretary was extended by FAO. Lately, these supports have gradually been reduced and in view of financial constraints, FAO may not be able to extend services of their staff for looking after the functions of APAARI Secretariat, including its Executive Secretary. Also, the office of APAARI has been shifted twice in the last one year and with expected changes in the leadership in FAO regional office, more uncertainties are expected.

As per the constitution of APAARI, it is envisaged to establish a regular Secretariat of APAARI in one of the member countries in the region with the support of the host country. For sustainability of APAARI, General Assembly may deliberate on this issue and decide as to how to proceed further in the matter.

Possible scenarios could be to :

- i. Continue with the existing arrangements with a request to Director General, FAO to extend needed support, either through FAO, RAP or through local FAO office in the country from where the Executive Secretary operates.
- ii. Request a CG Centre in the region to extend logistic support for the APAARI Secretariat.
- iii. Establish a separate office of APAARI with a full time Executive Secretary and staff. This would obviously involve huge expenses, for which APAARI presently is not prepared.
- iv. Request a member country to provide Secretariat Support for APAARI.

10. ANY OTHER ITEM

Any other item may be taken up with the permission of the Chair.



ASIA-PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS
(APAARI)

LIST OF PARTICIPANTS
OF THE
EXPERT CONSULTATION ON RESEARCH PRIORITY SETTING
BY NARS IN THE ASIA-PACIFIC REGION

November 25-26, 1996, New Delhi

FAO of the UN

1. Mr. Peter Rosenegger, FAO Representative in India & Bhutan, 55 Max Mueller Marg, New Delhi - 110 003.
2. Dr. N. Murthi Anishetty, Senior Officer, Plant Genetic Resources, Plant Production and Protection Division, FAO, Via le delle Terme di Caracalla, Rome, Italy.
3. Dr. Narong Chomchalow, Regional Plant Production Officer (Industrial Crops), FAO, Regional Office for Asia & the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok - 10200, Thailand.
4. Mr. P.K. Saha, Technical Officer, Plant Protection, FAO, Regional Office for Asia & the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok -10200, Thailand.

APAARI MEMBERS

5. Dr. J. Kumar, Director, Research, Koronivia Research Station, Ministry of Primary Industries, Forestry and Cooperatives, PO Box 77, Nausori, Fiji.
6. Dr. R.S. Paroda, Director General, Indian Council of Agricultural Research, Krishi Bhavan, New Delhi - 110 001.
7. Dr. Abbas Keshavarz, Deputy Head, Agricultural & Natural Research Organization (AREEO), Tabnak Avenue, Evin, Tehran 19835, Iran.
8. Dr. Makie Kokubun, International Research Coordinator, Information Division, JIRCAS, Ministry of Agriculture, Forestry & Fisheries, Ibraki, Japan.

9. Dr. C.M. Anwar Khan, Chairman, Pakistan Agricultural Research Council, Plot No. 20, G-5/1, Islamabad, Pakistan.
10. Dr. Badaruddin Soomro, Member (Crop Sciences), Pakistan Agricultural Research Council, Plot No.20, G-5/1, Islamabad, Pakistan.
11. Mr. Balthasar M. Wayi, Director, Agricultural Research Division, Department of Agricultural Livestock, PO Box 417, Konedobu, National Capital District, Papua New Guinea.
12. Dr. William D. Dar, Executive Director, Philippines Council for Agriculture, Forestry and Natural Resources, Research and Development (PCARRD), Los Banos, Philippines.
13. Dr. Young Sang Kim, Director General, International Technical Cooperation Centre, Rural Development Administration, Suweon - 441707, Korea.
14. Dr. R.A. Tony Fischer, Research Program Coordinator, ACIAR, ACIAR House, Traeger Court, Fern Hill Park, Bruce ACT 2617, Australia.
15. Dr. Jagdish Chandra Gautam, Executive Director, Nepal Agricultural Research Council, PO Box 5459, Kathmandu, Nepal.
16. Dr. S.T. Semisi, Assistant Director, Research, Ministry of Agriculture, Forestry, Fisheries & Meteorology, PO Box 1874, Apia, Western Samoa.

IFAD

17. Dr. Fransico R. Arias, Agricultural Consultant, 1929 Ridgemont Dr. San Jose CA 95148, USA.

CGIAR

18. Mr. Ismail Serageldin, Chairman, CGIAR, The World Bank, 1818-H Street, N.W., Washington, DC 20433, USA.
19. Mr. Sarwat Hussain, International Relations Officer, CGIAR, The World Bank, 1818-H Street, N.W., Washington, DC 20433, USA.

ICRISAT

20. Dr. James G. Ryan, Director General, ICRISAT, Patancheru, Andhra Pradesh-502324, India.
21. Dr. C.L.L. Gowda, Principal Scientist, ICRISAT, Patancheru, Andhra Pradesh-502324, India.

CIMMYT

22. Dr. Timothy Reeves, Director General, CIMMYT, Lisboa 27, PO Box 6-641, Mexico, 06600, DF, Mexico.

IRRI

23. Dr. George Rothschild, Director General, IRRI, PO Box 933, Manila, Philippines.
24. Dr. Robert Zeigler, Program leader, Irrigated Rice Program, IRRI, PO Box 933, Manila, Philippines.

CIP

25. Dr. Peter Gregory, Dy. Director General, International Potato Centre (CIP), Lima, Peru.
26. Dr. Sarat Ilangantileke, Regional Director for South and West Asia, IARI Campus, New Delhi.

IIMI

27. Dr. David Seckler, Director General, IIMI, 127, Sunil Mawatha, Palawatte Via Colombo, Sri Lanka.

ISNAR

28. Dr. C. Bonte-Friedheim, Director General, ISNAR, PO Box 93375, 2509 AJ, The Hague, The Netherlands.
29. Dr. Mekhlis Suleimanov, Vice-President, Kazak Academy of Agricultural Sciences, Almaty, Kazakstan.
30. Dr. Amir Muhammed, Consultant, ISNAR, PO Box 93375, 2509 AJ, the Hague, The Netherlands.

IPGRI

31. Dr. Kenneth W. Riley, Regional Director, IPGRI, Office for Asia, Pacific & the Oceania, C/O IDRC, RELC Building, 30 Orange Grove Road, Singapore 258352.
32. Dr. Masa Iwanga, DDG programme, IPGRI, Via delle Sette Chiese 142, 00145, Rome, Italy.
33. Dr. R.K. Arora, Regional Coordinator, IPGRI Office for South Asia, NBPGR Campus, New Delhi - 110 012.

ICLARM

34. Dr. (Ms.) Meryl J. Williams, Director General, ICLARM, Metro Manila, Philippines.
35. Mr. M.V. Gupta, Director, International Relations, ICLARM, Metro Manila, Philippines.

ICARDA

36. Dr. Mohan C. Saxena, Research Coordinator, ICARDA, Syria.

ILRI

37. Dr. C. Devendra, Senior Associate, ILRI, Nairobi, Kenya.

WORLD BANK

38. Dr. Michel Petit, Director, Agricultural Research, The World Bank, 1818-H Street, NW, Washington, DC 20433, USA.
39. Mr. Hamdy Eisa, Senior Agriculturist, Agril. Unit, The World Bank, 70, Lodi Estate, New Delhi.

AVRDC

40. Dr. Samson C. Tsou, Director General, AVRDC, PO Box 42, Shanhua, Tainan, Taiwan -74199, Republic of China.

ICAR

41. Dr. R.B.Singh, Director, Indian Agricultural Research Institute, Pusa Campus, New Delhi-110 012.
42. Prof. V.L. Chopra, National Professor, NRC on Plant Biotechnology, IARI, Pusa Campus, New Delhi - 110 012.
43. Dr. Gajendra Singh, DDG (Engineering), ICAR, Krishi Bhavan, New Delhi-110 001.
44. Dr. K.L. Chadha, DDG (Horticulture), ICAR, Krishi Bhavan, New Delhi-110 001.
45. Dr. E.A. Siddiq, DDG (Crop Sciences), ICAR, Krishi Bhavan, New Delhi-110 001.
46. Dr. P.V. Dehadrai, DDG (Fisheries), ICAR, Krishi Bhavan, New Delhi - 110 001.
47. Dr. M.L. Madan, DDG (Animal Sciences), ICAR, Krishi Bhavan, New Delhi-110 001.
48. Dr. Panjab Singh, Jt. Director (Research), IARI, Pusa Campus, New Delhi-110 012.
49. Dr. Anupam Verma, Dean, IARI, Pusa Campus, New Delhi - 110 012.
50. Mr. G.S. Sahni, Joint Secretary (DARE) & Secretary, ICAR, Ministry of Agriculture, Krishi Bhavan, New Delhi - 110 001.
51. Dr. N.N. Singh, Project Director (Maize), IARI, Pusa Campus, New Delhi-110 012.
52. Dr. Mangala Rai, ADG (P), ICAR, Krishi Bhavan, New Delhi - 110 001.

CAB INTERNATIONAL, UK

53. Dr. Robert J. Williams, Deputy Director General (Science), CABI, Wallingford, OXON, UK.

OTHERS

54. Dr. Nazmul Haq, Director, International Centre for Underutilized Crops, Institute of Irrigation Studies, University of Southampton, Highfield, Southampton SO17, IBJ, UK.
55. Dr. V.K. Patil, Vice-Chancellor, Marathwada Agricultural University, Parbhani, Maharashtra and President, Indian Universities Association, New Delhi.
56. Dr. (Mrs.) Kamala Chaudhary, Chairperson, Society for Wasteland Development, Bhartiya Kala Kendra Building, Copernicus Marg, New Delhi.
57. Dr. Eufemio T. Rasco, Jr. Coordinating Scientist, Asian Sweet potato and Potato Research and Development (ASPRAD), PO Box 933, Manila, Philippines.
58. Mr. Sherub Gyaltsen, Acting Director, REID, Ministry of Agriculture, Royal Government of Bhutan, PO Box No.252, Thimphu.
59. Mr. T.R. Gurung, REID, Ministry of Agriculture, Royal Government of Bhutan, PO Box No. 252, Thimphu.



**ASIA-PACIFIC ASSOCIATION OF AGRICULTURAL RESEARCH INSTITUTIONS
(APAARI)**

**LIST OF PARTICIPANTS
OF THE
FOURTH GENERAL ASSEMBLY MEETING**

November 26, 1996, New Delhi

CHAIRMAN

1. Dr. William D. Dar, Executive Director, Philippines Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Los Banos, Philippines.

VICE-CHAIRMAN

2. Dr. Abbase Keshavarz, Deputy Head, Agriculture and Natural Resources Research Organization (AREEO), Tabnak Avenue, Evin, Tehran, Iran.

EXECUTIVE SECRETARY

3. Dr. R.S. Paroda, Director General, Indian Council of Agricultural Research, (ICAR), Dr. Rajendra Prasad Road, Krishi Bhavan, New Delhi - 110 001.

EXECUTIVE COMMITTEE

4. Dr. Jagdish Chandra Gautam, Executive Director, Nepal Agricultural Research Council (NARC), Khumaltar, Lalitpur, Kathmandu, Nepal.
5. Dr. Young Sang Kim, Director General, International Technical Cooperation Centre (ITCC), Rural Development Administration (RDA), Suweon - 441 707, Korea.
6. Dr. S.T. Semisi, Asstt. Director (Research), Ministry of Agriculture, Forestry, Fisheries Research Division, Government of Western Samoa, PO Box 1587, Apia, Western Samoa.
7. Dr. C.M. Anwar Khan, Chairman, Pakistan Agricultural Research Council, Plot No.20, G-5/1, PO Box 1031, Islamabad, Pakistan.

8. Mr. Balthasar M. Wayi, Director, Agricultural Research Division, Department of Agricultural Livestock, PO Box 417, Konedobu, National Capital District, Papua New Guinea.
9. Dr. R.A. Tony Fischer, Research Program Coordinator, ACIAR, ACIAR House, Traeger Court, Fern Hill Park, Bruce ACT 2617, Australia.
10. Dr. J. Kumar, Director, Research; Koronivia Research Station, Ministry of Primary Industries, Forestry and Cooperatives, PO Box 77, Nausori, Fiji.
11. Dr. Makie Kokubun, International Research Coordinator, Information Division, JIRCAS, Ministry of Agriculture, Forestry & Fisheries, Ibraki, Japan.

OTHER INVITEES :

12. Mr. Peter Rosenegger, FAO Representative in India and Bhutan, 55, Max Mueller Marg, New Delhi - 110 003.
13. Dr. R.B. Singh, Director, IARI, Pusa Campus, New Delhi - 110 012.
14. Dr. C.L.L. Gowda, Principal Scientist, ICRISAT, Patancheru, Andhra Pradesh - 502324.
15. Dr. Narong Chomchalow, Plant Protection Officer, FAO of the UN, regional Office for Asia & the Pacific, Bangkok, Thailand.
16. Mr. P.K. Saha, Technical Officer (Plant Protection), FAO regional Office for Asia & the Pacific, Bangkok, Thailand.
17. Eufemio T. Rasco, Jr. Coordinating Scientist, Asian Sweet Potato and Potato Research and Development (ASPRAD), PO Box 933, Manila, Philippines.
18. Dr. Nazmul Haq, Director, International Centre for Underutilized Crops, Institute of Irrigation Studies, University of Southampton, Highfield, Southampton SO 17, IBJ, UK.
19. Dr. N.N. Singh, Project Director (Maize), IARI Pusa Campus, New Delhi - 110 012.

ANNEXURE-III

MEMBERSHIP FEE
As on October 1996

Country	YEAR										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
1. Australia			X			X					
2. Bangladesh				X	X						
3. China											
4. Fiji	X	X	X	X	X	X	X	X	X	X	
5. India	X	X	X	X	X	X	X	X	X	X	
6. Iran	X	X	X	X	X	X	X	X	X	X	
7. Japan	X	X	X	X	X	X	X	X	X	X	
8. Malaysia	X	X	X	X	X	X	X	X	X	X	
9. Nepal	X	X	X	X	X	X	X	X	X	X	
10. New Zealand	X	X	X	X	X	X	X	X	X	X	
11. Pakistan	X	X	X	X	X	X	X	X	X	X	
12. Papua New Guinea	X	X	X	X	X	X	X	X	X	X	
13. Philippines (BAR)											
14. Philippines (PCARRD)	X	X	X	X	X	X	X	X	X	X	
15. Republic of Korea	X	X	X	X	X	X	X	X	X	X	
16. Sri Lanka	X	X	X	X	X	X	X	X	X	X	
17. Thailand	X	X	X	X	X	X	X	X	X	X	
18. Vietnam											
19. Western Samoa	X	X	X	X	X						

ANNEXURE-IV(a)

SUMMARY STATEMENT OF APAARI
01 January-31 October, 1996

(Amount in US Dollars)

ITEMS	RECEIVED	DISBURSEMENTES		BALANCE
		Budget	Actual Used	
	Amount B/F			231,708.27
1. Membership Fee	59,964.04			
2. Donations:				
2.1 From ISNAR, The Netherlands	11,980.25			
2.2 From ACIAR, Australia	15,850.47			
3. Interest Income	5,117.50			
4. Profit and Loss on Transfer	94.80			
5. Publications		10,000.00	4,760.00	
6. APAARI Secretariat Support:				
6.1 Secretary/Technical Assistant		25,000.00	5,580.00	
6.2 Office Equipment, Office Stationary & Postage		5,000.00	43.84	
6.3 Miscellaneous		10,000.00	300.42	
7. Consultancy/Travel				
7.1 Special Service Agreement (SSA)			5,000.00	
8. Expert/Consultation; General Assembly (Partial Support)		25,000.00		
8.1 Expenses to Ex-Com Assembly			14,349.70	
8.2 Expenses to 4th General Assembly			34,022.00	
TOTAL	93,007.06	75,000.00	64,055.96	260,659.37

Amount in Saving Account (US Dollars) US\$ 260,213.21
 Amount in Current Account (Baht: 10,189.82) US\$ 407.59
 Cash in hand (Baht: 964.50) US\$ 38.58

ANNEXURE-IV (b)

COMPARING STATEMENT BETWEEN BUDGET AND ACTUAL USED
During the period of 1 January to 31 October, 1996

Date	Items	Budget for 1996 (US \$)	US\$	Baht	Actual Used Eqv. to US \$*	Total
20/01/96	1. PUBLICATIONS	10,000.00				
	The first printing of Directory-South Asia			66,000.00		
22/03/96	The second printing of Directory-South Asia			38,000.00		
21/08/96	APAARI Executive Meeting, 3/2/96		0.00	15,000.00		
	Sub Total		0.00	119,000.00	4,760.00	4,760.00
	2. APAARI SECRETARIAT SUPPORT	25,000.00				
	i) Secretary/Tech. Assistant			16,500.00		
2/01/96	Salary for Jan & one child's allowance			17,000.00		
26/02/96	Salary for Feb. & two children's allowance			17,000.00		
28/03/96	Salary for March & two children's allowance			17,000.00		
27/04/96	Salary for April & two children's allowance			18,000.00		
25/07/96	Salary for July 1996			18,000.00		
27/08/96	Salary for August 1996			18,000.00		
27/09/96	Salary for September 1996			18,000.00		
28/10/96	Salary for October 1996		0.00	18,000.00		
	Sub Total		0.00	139,500.00	5,580.00	5,580.00
	ii) Office Stationery & Postage	5,000.00				
23/01/96	Stationeries			674.00		
10/04/96	Stationery			102.00		
05/06/96	Stationery			320.00		
	Sub Total		0.00	1,096.00	43.84	43.84

APAARI Proceedings

Date	Items	Budget for 1996 (US \$)	US\$	Baht	Actual Used Eqv. to US \$*	Total
	iii) Miscellaneous	10,000.00				
08/0/96	Overtime to Janitor of FAO: Mr. Sawai			150.00		
12/01/96	Overtime to Janitor of FAO: Mr Saing			100.00		
30/03/96	Interest of Overdraw from C/A			34.90		
09/04/96	Communication by courier			1,950.00		
19/04/96	Paper box & transportation			200.00		
29/04/96	Overtime to Janitor of FAO: Ms. Sudjai			1,200.00		
14/05/96	Communication by courier			450.00		
10/07/96	Transportation			120.00		
16/08/96	Overtime to Janitor of FAO: Ms. Sudjai			600.00		
20/08/96	Labour cost for moving office to new building			500.00		
26/08/96	Overtime to Janitor of FAO: Ms. Sudjai			600.00		
16/09/96	Brass stickers for office			120.00		
26/09/96	Stamp/Fee for a new cheque book			100.00		
30/09/96	Overtime to Janitor of FAO: Ms. Sudjai - Sept.			300.00		
22/10/96	Communication by courier - Dr. Paroda			695.50		
28/10/96	Padded envelopes			90.00		
31/10/96	Overtime to Janitor of FAO - Oct.			300.00		
	Sub Total		0.00	7,510.40	300.42	300.42
	3. CONSULTANCY/TRAVEL	20,000.00				
	i) Special Service Agreement (SSA):					
20/08/96	SSA on writing manuscript to Mr. Cho		2,000.00			
20/09/96	SSA on completing report to Dr. Dar		3,000.00			
	Sub Total		5,000.00	0.00	0.00	5,000.00
	ii) Airtickets & Daily Substance Allowance (DSA):					
	Sub Total		0.00	0.00	0.00	0.00

Annexures

Date	Items	Budget for 1996 (US \$)	US\$	Baht	Actual Used Eqv. to US \$*	Total
4	TRAINING/SELECTED RESEARCH PROJ. SUPPORT	10,000.00				
5.	EXPERT/CONSULTATION, GENERAL ASSEMBLY	25,000.00				
18/01/96	i) Expenses to Ex-Com Meeting Transfer to FAOR/APAARI, India		5,000.00			
18/01/96	Commission for transfer (US\$ 5,000) to FAOR, India			500.00		
15/01/96	Airticket for Mr. A.Z.M. Obaidullah Khan, ADG/RR			23,325.00		
23/01/96	DSA to Mr. A.Z.M. Obaidullah Khan ADG/RR		669.00	100.00		
23/01/96	Commission charged (withdraw US \$ 669)					
26/01/96	Commission charged (withdraw 5,000 US \$)					
01/02/96	DSA to Dr. M.S.U. Chowdhury, Bangladesh		176.00	317.50		
	DSA to Dr. Abbas Keshvarz, Iran		318.00			
	DSA to Dr. R.P. Sapkota, Nepal		176.00			
	DSA to Dr. William D. Dar		318.00			
	DSA to Dr. R. Mahindapala, Srilanka		176.00			
	DSA to Dr. S.T. Semisi, Western Samoa		602.00			
	DSA to Dr. Z. Altaf, Pakistan		318.00			
	DSA to Dr. B. Soomro, Pakistan		318.00			
	DSA to Dr. Md. Sharif bin Ahmad, Malaysia		460.00			
	DSA to Dr. Chanuan Ratanawaraha, Thailand		526.00			
	DSA to Dr. Y.S. Kim, Korea		460.00			
	DSA to Dr. M.V. Quyen, Vietnam		176.00			
	Balance adjusted to Dr. William D. Dar's airline		976.00			
06/03/96	Reimburse to Dr. Md. Sharif bin Ahmed's airfare		1,527.00			
06/03/96	Reimburse to Dr. Mahindapala's airfare		484.00			

APAARI Proceedings

Date	Items	Budget for 1996 (US \$)	US\$	Baht	Actual Used Eqv. to US \$*	Total
06/03/96	Reimburse to Mr. P.K. Saha paid to Dr Semisi's DSA for one day stop-over in NZ		100.00			
06/03/96	Commission charged (withdraw 100 US\$)		596.00	100.00		
11/04/96	Reimburse to Dr. Abbas Keshavarz's airfare		13,376.00	24,342.50	973.70	14,349.70
	Sub Total					
	ii) 4th General Assembly/Expert Consultation setting by NARS					
24/10/96	Transfer to FAOR/APAARI-India		34,000.00			
24/10/96	Commission on transfer US \$ 34,000 to FAOR/APAARI-India		34,000.00	550.00	22.00	34,022.00
	Sub Total					
	6. Sub-Office		0.00	0.00	0.00	0.00
	Sub Total					
	GRAND TOTAL	105,000.00	52,376.00	291,998.90	11,679.96	64,055.96

* The Exchange Rate is 25.00

ANNEXURE-V

BUDGET PROPOSED FOR 1997 AND 1998
(US \$)

Sl. No	Items	1997	1998
1.	Publications (Newsletter, Directory, Technical Reports, etc.)	12,000	15,000
2.	APAARI Secretariat Support :		
	i. Secretary/Technical Assistant	25,000	30,000
	ii. Office Stationery & Postage	08,000	10,000
	iii. Miscellaneous Items	15,000	20,000
	Consultancy/Travel	15,000	20,000
3.	Training/Selected Research Projects/Networks Support	10,000	10,000
4.	Expert Consultation/General Assembly of APAARI (Partial Support)	15,000	25,000
	TOTAL	100,000	130,000

- Note* : 1. The above estimated Budget for the years 1997 and 1998 is in line with the 1995 and 1996 Budget approved by the last Third General Assembly of APAARI in 1994.
2. In the context of the current situation of FAO, regional Office for Asia & the Pacific, Bangkok, all autonomous technical bodies under the aegis of FAO would be required to bear the cost of utility/service facilities in the new building where all the autonomous bodies secretariat have been accommodated.

ANNEXURE-VI

BUDGET APPROVED FOR 1997 AND 1998
(US \$)

Sl. No	Items	1997	1998
1.	Publications (Newsletter, Directory, Technical Reports, etc.)	12,000	15,000
2.	APAARI Secretariat Support :		
	i. Secretary/Technical Assistant	25,000	30,000
	ii. Office Stationery & Postage	08,000	10,000
	iii. Miscellaneous Items	15,000	20,000
	Consultancy/Travel	15,000	20,000
3.	Training/Selected Research Projects/Networks Support	35,000*	35,000**
4.	Expert Consultation/General Assembly of APAARI (Partial Support)	15,000	20,000
	TOTAL	125,000	150,000

* with provision to increase it upward upto \$125,000 provided need arises to support the networks

** with provision to increase it upward upto \$150,000 provided need arises to support the networks

Note : 1. The above Budget for the years 1997 and 1998 is in line with the 1995 and 1996 Budget approved by the last Third General Assembly of APAARI in 1994.

2. In the context of the current situation of FAO, regional Office for Asia & the Pacific, Bangkok, all autonomous technical bodies under the aegis of FAO would be required to bear the cost of utility/service facilities in the new building where all the autonomous bodies secretariat have been accommodated.

A MEMORABLE EVENT



Dr. Shankar Dayal Sharma, Hon'ble President of India inaugurating the Second International Crop Science Congress (ICSC) held at New Delhi, November 18-24, 1996. APAARI Expert Consultation and Fourth General Assembly meetings were held in conjunction

