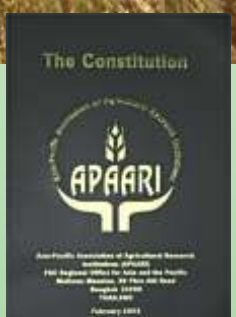

Fifteen Years of APAARI -A Retrospective

Asia-Pacific Association of Agriculturral Reserach Institutions
C/o FAO Regional Office for Asia and the Pacific
Bangkok, Thailand

Fifteen Years of APAARI — A Retrospective

R.S. Paroda
R.K. Arora

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FOREWORD

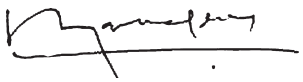
The Asia-Pacific Association of Agricultural Research Institutions (APAARI) was established in 1990, primarily to strengthen the agricultural research capabilities of the region and to enable the sharing of experiences among national partners/the National Agricultural Research Systems (NARS), in collaboration with international organizations, fora and other centers. APAARI is an apolitical, neutral forum in pursuit of common objectives to mitigate poverty, increase agricultural productivity and resource-use, protect/conserve the environment and attain agricultural sustainability. Since its establishment in the past 15 years, APAARI has emerged as a dynamic regional forum. Its activities and ARD priorities are directed by its well phased out perspective plan and Vision 2025. It has organized expert consultations and dialogues on issues of emerging concerns to the NARS of the Asia-Pacific such as on ARD priority setting at national, subregional and regional level, need to strengthen regional research networks and consortia, strengthening of the Asia-Pacific Agricultural Research Information System (APARIS) and Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB), both operating as APAARI programs; and promoting new initiatives such as on post-harvest technology, natural resource management and linking farmers to markets.

APAARI has been particularly active in bringing out very useful publications - newsletters, proceedings of expert consultations, success stories based on research thrust of national programs and other thematic publications.

Earlier in 2001, APAARI did bring out a brief account of its 'Decade of Progress'. Realizing the changes in agricultural scenario, the role of APAARI in fostering agricultural research for development has also got enormously widened commensurate with needs of both developed and developing NARS., as is well evident from its diverse activities. Thus, for the benefit of our stakeholders, we feel it appropriate to bring out a more elaborate account of APAARI achievements over the last 15 years of its existence.

This publication with enormous efforts of Drs. R.S. Paroda and R.K. Arora is indeed very timely. It gives details of the efforts put forth by APAARI in providing regional thrust, tracing its growth and development and the impact of its collaborative activities over the past 15 years; providing a retrospective, a well-synthesized report to serve as a handy document for use of NARS and other partners/stakeholders and policy makers. In line with the Millennium Development Goals (MDGs), new strategies of CGIAR, and overall global concerns, APAARI's efforts, as reflected herein, address the emerging challenges of alleviating poverty, ensuring food security and agricultural sustainability.

I am sure that the wider dissemination of this publications will be of great benefit not only to the NARS of the Asia-Pacific and other APAARI partners in the region, but equally to other national, regional and international organizations in strengthening future collaboration aimed at harnessing ARD for human welfare.



Prof. H.P.M. Gunasena
Chairman, APAARI and
Executive Director, CARP, Sri Lanka

ACKNOWLEDGEMENTS

This publication is based on the information synthesized from various APAARI publications brought out since its establishment in 1990: newsletters, success stories, proceedings of expert consultations, other thematic publications, reports, etc. We express our sincere thanks to Dr. Betty del Rosario, Asstt. Executive Secretary, APAARI for going through the manuscript; to Dr. Sahdev Singh, former Asstt. Executive Secretary, who provided needed input on APARIS program and to Dr. J.L. Karihaloo, Coordinator, APCoAB for his contribution relating to APCoAB. Mr. P.K. Saha, Liaison Officer, besides going through the manuscript, had been helpful in providing relevant documents that facilitated compilation of this information. We also acknowledge the help provided by Ms. Urairat Rujirek, Office Secretary, APAARI for her assistance.

The APAARI's achievements, in retrospect, are the result of very strong collaboration among its diverse members/partners and support institutions, which include NARS of the region, several regional and international organizations, particularly the CG Centers, FAO RAP, GFAR, ACIAR, JIRCAS, AVRDC, ICIMOD, etc. Support to APARIS has been coming from ACIAR and GFAR. The private sector has also provided collaboration such as APSA, and more recently MONSANTO, MAHYCO and the Rockefeller Foundation specifically for the APCoAB activities.

We take this opportunity to express our sincere thanks to all APAARI members and other collaborators in bringing out this comprehensive publication on successful completion of 15 years of APAARI.

Authors

CONTENTS

ACRONYMS AND ABBREVIATIONS

AAACU	Association of Asian Agricultural Colleges and Universities
AARINENA	Association of Agricultural Research Institutions in the Near East and North Africa
ACIAR	Australian Center for International Agricultural Research
ACUC	Asian Center for Underutilized Crops
ADB	Asian Development Bank
AFGRN	Asia Fruits Genetic Resources Network
AFITA	Asian Federation for Information Technology in Agriculture
AGRIS	International Information System for Agricultural Sciences and Technology
AIT	Asian Institute of Technology
AMBIONET	Asian Maize Biotechnology Network
ANGOC	Asian NGO Coalition for Agrarian Reform and Rural Development
ANMAP	Asian Network on Medicinal and Aromatic Plants
ANSWER	Asian Network on Sweet Potato Research
APAARI	Asia-Pacific Association of Agricultural Research Institutions
APAFRI	Asia-Pacific Association of Forestry Research Institutions
APAN	Asia-Pacific Advanced Network
APARIS	Asia-Pacific Agricultural Research Information System
APCoAB	Asia-Pacific Consortium on Agricultural Biotechnology
APFORGEN	Asia-Pacific Forest Genetic Resources Program
APHCA	Animal Production and Health Commission for Asia and the Pacific
APSA	Asia and Pacific Seed Association
ARD	Agricultural Research for Development
AREO	Agricultural Research and Education Organization (Iran)
ARI	Advanced Research Institute
AROW	Agricultural Research Organizations on the Web
ASEAN	Association of South-East Asian Nations
ASTI	Agricultural Science and Technology Indicator
Aus-AID	Australian Agency for International Development

AVRDC	Asian Vegetable Research and Development Center (World Vegetable Center)
BAIF	Bhartiya Agro-industries Foundation
BAPNET	Banana and Plantain Network
BAR	Bureau of Agricultural Research (Philippines)
BARC	Bangladesh Agricultural Research Council
BCP	Biotechnology Coalition of the Philippines
BIOTECH	National Center for Genetic Engineering and Biotechnology (Thailand)
BMZ	German Ministry of Economic Development
CAAS	Chinese Academy of Agricultural Sciences (People's Republic of China)
CABI	Center for Agricultural Bioscience International
CAC	Central Asia and Caucasus
CACAARI	Central Asia and the Caucasus Association of Agricultural Research Institutions
CARP	Sri Lanka Council for Agricultural Research Policy
CBD	Convention on Biological Diversity
CD-ROM	Compact Disk- Read only Memory
CEBAR	Center for Research in Biotechnology for Agriculture
CGIAR	Consultative Group on International Agricultural Research
CIMBAA	Collaboration for Insect Management in Brassica in Asia and Africa
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CIP	Centro Internacional de la Papa (International Potato Center, Peru)
CIRAD	Center de Coopération Internationale en Recherche Agronomique pour le Développement
CLAN	Cereals and Legumes Asia Network
COA	Council of Agriculture (Chinese Taipei)
COGENT	Coconut Genetic Resources Network
CORRA	Council for Partnerships on Rice Research in Asia
CP	Challenge Program
CSOs	Civil Society Organizations
DFID	Department for International Development
DOA	Department of Agriculture (Thailand)
EA-PGR	East Asia Plant Genetic Resources Network

EFARD	European Forum for Agricultural Research and Development
EGFAR	Electronic Global Forum on Agricultural Research (Homepage of GFAR)
FAO	Food and Agriculture Organization of the United Nations
FAO RAP	FAO Regional Office for Asia and the Pacific
FARA	Forum on Agricultural Research in Africa
FORAGRO	Foro Regional de Investigation y Dessarrollo Technologico Agropecuario
GBN	Global Biosaline Network
GCDT	Global Crop Diversity Trust
GCHERA	Global Consortium for Higher Education and Research in Agriculture
GEF	Global Environment Facility
GFAR	Global Forum on Agricultural Research
GIS	Geographic Information System
GLOBAL-RAIS	Global Regional Agricultural Information System
GM/GMO	Genetically Modified, Genetically Modified Organism
GoFAR	Group on Fisheries and Aquaculture Research
GPA	Global Plan of Action
GPHI	Global Post-Harvest Initiative
GPP	Global Partnership Program
GTZ	German Agency for Technical Cooperation
HRD	Human Resource Development
IAC	Institut Agronomique Neo-Caledonien
IARC	International Agricultural Research Center
ICAR	Indian Council of Agricultural Research
ICARDA	International Center for Agricultural Research in the Dry Areas
ICBA	International Center for Biosaline Agriculture
ICGEB	International Center for Genetic Engineering and Biotechnology
ICIMOD	International Center for Integrated Mountain Development
ICLARM	International Center for Living Aquatic Resources Management (World Fish Center)
ICM	Information Communication Management
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communication Technology

ICUC	International Center for Underutilized Crops
IDRC	International Development Research Center
IFAD	International Fund for Agricultural Development
IFAP	International Federation of Agricultural Producers
IFPRI	International Food Policy Research Institute
ILCA	International Livestock Center for Africa
ILRI	International Livestock Research Institute
INBA	International Islamic Network on Biosaline Agriculture
INCANA	Inter-regional Network on Cotton in Asia and North Africa
INGA	International Network on Genetic Resources of Aquaculture
INGER	International Network for Genetic Evaluation of Rice
INIBAP	International Network for the Improvement of Banana and Plantain
Inwent	Capacity Building International, Germany
IPGRI	International Plant Genetic Resources Institute
IPGRI-APO	IPGRI Office for Asia, the Pacific and Oceania
IPM	Integrated Pest Management
IPR	Intellectual Property Rights
IRRI	International Rice Research Institute
ISAAA	International Service for the Acquisition of Agribiotech Application
ISAP	Indian Society of Agribusiness Professional
ISAS	Indian Society of Agricultural Statistics
ISNAR	International Service for National Agricultural Research
ITDG	International Technology Development Group
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IWMI	International Water Management Institute
JIRCAS	Japan International Research Center for Agricultural Sciences
MAFF	Ministry of Agriculture, Forestry and Fisheries, Fiji
MARD	Ministry of Agriculture and Rural Development, Vietnam
MARDI	Malaysian Agricultural Research and Development Institute
MCFF	Ministry of Commerce, Forests and Fisheries, Western Samoa
MDGs	Millennium Development Goals
MIS	Management Information System
MoU	Memorandum of Understanding

MSSRF	M.S. Swaminathan Research Foundation
NACA	Network of Aquaculture Centers in Asia-Pacific
NAIB	National Institute of Agricultural Biotechnology, Republic of Korea
NAIS	National Agricultural Information System
NARC	Nepal Agricultural Research Council
NARI	National Agricultural Research Institute
NARO	National Agricultural Research Organization
NARS	National Agricultural Research System
NARS-SC	Secretariat of the NARS Steering Committee, GFAR
NGO	Non-Governmental Organization
NINP	National Information Nodal Point
NRM	Natural Resource Management
NSTDA	National Science and Technology Development Agency, Bangkok, Thailand
OECD	Organization for Economic Cooperation and Development
PAPGREN	Pacific Agricultural Genetic Resources Network
PARC	Pakistan Agricultural Research Council
PCARRD	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
PFU	Program Facilitation Unit
PGR	Plant Genetic Resources
PHT	Post-Harvest Technology
PNG	Papua New Guinea
PPP	Public-Private Partnership
PRAP	Pacific Regional Agricultural Program
R&D	Research and Development
RAEL	Regional Agricultural Expert Locator
RAIS	Regional Agricultural Information System
RDA	Rural Development Administration, Republic of Korea
RECSEA–PGR	Regional Cooperation in South East Asia-Plant Genetic Resources
RIS	Research and Information System for Developing Countries
RRNs	Regional Research Networks
RWC	Rice-Wheat Consortium
SAARC	South Asian Association for Regional Cooperation

SAIC	SAARC Agricultural Information Center
SANPGR	South Asia Plant Genetic Resources Network
SAVERNET	South Asia Vegetable Research Network
SDC	Swiss Development Corporation
SDLEARN	Sustainable Development Learning Network
SEARCA	SEAMEO Regional Center for Graduate Study and Research in Agriculture
SGRP	System-wide Genetic Resources Program
SMTA	Standard Material Transfer Agreement
SPC	South Pacific Commission/Secretariat of the Pacific Community
SPFDP	South Pacific Forestry Development Program
SSEEA	South, South East and East Asia
SWOT	Strengths-Weaknesses-Opportunities-Threats
TAAS	Trust for Advancement of Agricultural Sciences
TAMNET	Tropical Asia Maize Network
TFNet	Tropical Fruit Network
ToR	Terms of Reference
TPS	True Potato Seed
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCAP-CAPSA	Center for Alleviation of Poverty through Secondary Crops Development in Asia and the Pacific
UPM	University Putra Malaysia
USAID	United States Agency for International Development
USP	University of South Pacific
UTFANET	Underutilized Tropical Fruits Asia Network
WAICENT	World Agricultural Information Center
WFC	World Fish Center
WHO	World Health Organization
WISARD	Web-based Information Services for Agricultural Research for Development
WTO	World Trade Organization
XML	Extensible Markup Language

I. INTRODUCTION

Background Information

The Asia-Pacific region extends over a vast area consisting of 39 countries representing West Asia, South Asia, South-East Asia, East Asia and the Pacific. The region exhibits a wide range of variation in climate, physiography and ecology. Its diverse ecoclimates support equally diverse ecosystems encompassing plains and mountainous tracts with tropical semi-arid, sub-humid, humid tropical; coastal/oceanic; subtropical to temperate high altitude, cold arid habitats/environments. The region has a rich agricultural heritage reflecting diverse ethnic and cultural antiquity. Also, it is a seat of domestication and diversification of several of our staple/food and other important crops (Box 1), livestock, fish and other agrobiodiversity as well as the rich and unique wild flora and fauna exhibiting wide range of natural biodiversity. Infact, this region holds all kinds of agroclimatic/biological niches representing world's biomes.

The Asia-Pacific region is the home of about 3.4 billion people representing nearly 60 per cent of the world's population. Also, 70 per cent of the world's farming households live here on less than 30 per cent of the global agricultural land. Majority of the farmers are small holders, production is low and highly unstable, while there is intense demand for more food and other products because of population pressure. Further, there exists enormous variation in total land, land use, total population and agricultural population in the Asia-Pacific countries for different sub-regions. The geographical jurisdiction of APAARI region is given in Fig. 1.

The region is engulfed by poverty, food insecurity and malnutrition. Of the 777 million malnourished people in the developing world, nearly 60 per cent live in the Asia-Pacific region. Further, of the 800 million poor people around the world who are food insecure, 48 per cent are in the developing countries of the Asia-Pacific region. One of the poorest country in the world, Timor-Leste (East Timor), is located in this region, in South-East Asia.

Though the above constraints are of alarming nature and continue to persist, agricultural research for development, in the wake of rapid globalization and interdependence, has been addressing these issues on priority, making full use of national and regional assets and the great opportunities that the Asia-Pacific region offers for agricultural growth and productivity. This has been significantly achieved through the impact of the green revolution associated with white and blue revolutions over the past few decades.

In this context, realizing the changes in the agricultural scenario, the role of APAARI in fostering agriculture and development in the Asia-Pacific region has also got enormously widened since its establishment, commensurate with the needs of both developed and developing NARS. This regional forum has been actively debating on several such emerging concerns, equally reflecting the Millennium Development Goals (MDGs) involving FAO, GFAR, CGIAR/IARCs and other organizations for strengthening agricultural research for development. Earlier in 2001, APAARI had brought out a brief account of its 'Decade of Progress'. However, the present publication gives greater details and is intended to highlight/address the efforts put forth by APAARI in providing regional thrust, tracing its growth and development, and the impact of its activities undertaken over the past 15 years; providing a retrospective, a well-synthesized report to serve as a handy document for use by NARS, other partners/diverse stakeholders and the policy makers. The document also conveys the message that agricultural research for development capitalizing on advances made in science and technology must play an important role in meeting the challenges of alleviating poverty, ensuring food security and agricultural sustainability.

Box 1: Asia-Pacific region is rich in agrobiodiversity

- The Asia-Pacific region is a cradle of domestication and primary center of diversity for many of the world's crop plants and forest resources. Crops, such as white jute, tree cotton, eggplant, pigeonpea, mango, jackfruit and cucumber originated from the Indian Gene Center; soybean, buckwheat, tea, citrus, litchi, peach, proso millet and foxtail millet from the Chinese Center; oriental rice, yam, taro, banana, mango and rambutan from South-East Asia, and also, yams, taro, coconut and breadfruit from the Pacific islands. A wide range of native diversity occurs in grain legumes, oilseeds, leafy vegetables, spices and condiments, medicinal plants, forages and forest species.
- This region is also a secondary center of diversity for introduced crops, such as maize, wheat, sorghum, groundnut, finger millet, chillies, pumpkin, okra, tomato, potato, sweet potato, papaya, guava, pineapple and several other tropical American fruits.
- Of the twelve regions of diversity of cultivated plants in the world, four are located here, namely, the Chinese-Japanese region, Indonesian region, Australian region and the Indian region.

Fig 1. Geographical jurisdiction of Asia-Pacific region

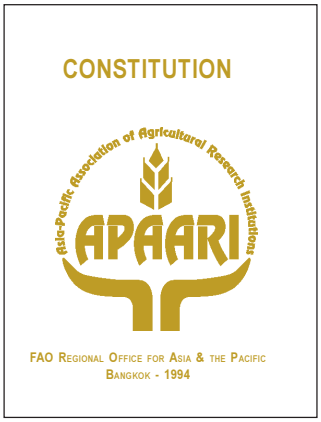
II. GENESIS OF APAARI

APAARI Established; Constitution Developed

Aware of the problems and challenges and realizing the opportunities available, the heterogeneity among NARS and the regional needs to coordinate agricultural research and development for the benefits of the national programs, the FAO of the United Nations, organized during the mid-80s two regional consultations (Islamabad, 1984; Bangkok, 1985) which recommended the creation of a regional association to strengthen NARS. This led to the establishment of the Asia-Pacific Association of Agricultural Research Institutions (APAARI) in 1990, primarily to strengthen the national agricultural research capabilities of the region and to enable the sharing of experience among national partners, to alleviate poverty, increase productivity and resource-use, protect/conserve the environment and attain agricultural sustainability.

Accordingly, to initiate its functioning and coordination, plan and prioritize programs/activities, APAARI constitution was developed and adopted in December 1990 by the General Assembly in its meeting held at FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. The Constitution was published in December 1991, and subsequently revised in September 1994, followed by another amendment in February 2003 as per NARS needs in particular and overall regional developments. It has 17 Articles and 32 paragraphs detailing its structure, management and governance, and system and procedures.

APAARI is an apolitical, neutral, non-profit forum of Agricultural Research Institutions, National Agricultural Research Systems (NARS) in the Asia-Pacific region, in the pursuit of common objectives (under the sponsorship of FAO).



Establishment of APAARI: Significant events

• 1984-85	• FAO regional consultations recommend creation of regional association to strengthen NARS
• 1990-91	• Asia-Pacific Association of Agricultural Research Institutions (APAARI) established
	• APAARI Constitution developed, adopted by the General Assembly and published
	• APAARI activities initiated; First Executive Committee in place
• 1992-93	• APAARI logo designed, approved
	• Collaborative activities further planned, phased out
• 1994	• APAARI Constitution revised

APAARI meeting held in Yogyakarta, Indonesia in November 1993 with Dr Mohd. Yusaf bin Hashim, the then DG MARDI as Chairman, APAARI Executive Committee

III. OBJECTIVES, FUNCTIONS, STRUCTURE AND GOVERNANCE

Mission and Objectives

The 'Mission' of APAARI is to promote the development of national agricultural research systems in the Asia-Pacific region through facilitation of intra-regional, inter-institutional, and international cooperation/partnership.

The overall objective of the Association is to foster agricultural research for development in the Asia-Pacific region so as to help address the concerns of hunger, poverty, environmental degradation and sustainability of agricultural production. More specifically, the objectives are as follows:

a) Promote the exchange of scientific and technical know-how and information in agriculture;

b) Encourage the establishment of appropriate co-operative research and training programs in accordance with identified regional, bilateral or national needs and priorities;

c) Assist in prioritizing NARS/Regional needs, strengthening of research organizational and management capabilities of member institutions including information and communication technology;

d) Strengthen cross-linkages among national, regional and international research centers and organizations including universities through involvement in jointly planned research and training programs; and

e) Promote collaborative research among member institutions including need based support to regional research networks.

Functions

In pursuance of the above objectives, the Association may undertake one or more of the following activities:

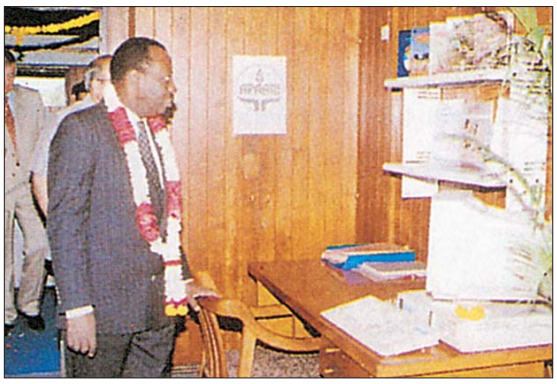
a) Convene General Assembly to discuss the Association's policies and priorities, work plan and administration;

b) Organize working groups, meetings and seminars to discuss specific problems or sponsor technical studies, training courses and workshops;

c) Collect, collate and disseminate research information;

d) Maintain links with agencies, institutions, organizations and other entities undertaking similar activities within and outside the region including donor institutions; and

e) Promote collaborative research among member institutions.



Dr. Jacques Diouf, DG FAO
visits APAARI Office

Organizational Structure and Operation/Management

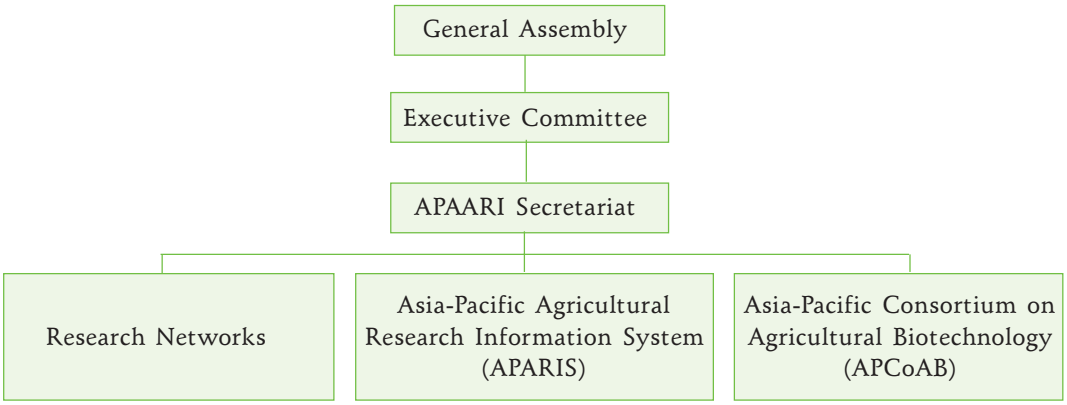
The activities of APAARI as per its Constitution are carried out by its Executive Committee which is elected from among member NARS once every two years. It is composed of a Chairman, a Vice-Chairman, and Executive Secretary and four other Executive members*. The Executive Secretary has the overall responsibility to execute the activities and manage the functioning of the Secretariat. Appendix I gives the composition of the Executive Committees 1991-92 onwards to date. The composition of the Executive Committee for 2005-2006 is as follows:

APAARI Executive Committee (2005-2006)		
Chair	Dr. Herath P.M. Gunasena	Sri Lanka
Vice-Chair	Dr. Thierry Mennesson	New Caledonia
Members	Dr. Shinobu Inanaga	Japan
	Dr. M.E. Tusneem	Pakistan
	Mr. Nicomedes P. Eleazar	Philippines
	Mr. Luke Ratuvuki	Fiji
Executive Secretary	Dr. Raj S. Paroda	India

*The composition of the Executive Committee is proposed to be amended during the 9th General Assembly on 7 November 2006 in New Delhi, India to provide seats to other stakeholders.

Currently, APAARI operates through the following organizational structure:

APAARI Organizational Structure



In line with the above organizational structure, the General Assembly develops policies, priorities and programs every two years. The Executive Committee is responsible for managing the affairs of APAARI in accordance with policies and directives adopted by the biennial General Assembly. The Secretariat of APAARI is headed by the Executive Secretary (Dr. R.S. Paroda) who is responsible for carrying out the overall program, allocation of budget, convening of Executive Committee and General Assembly meetings. Currently, the Secretariat, located at FAO Regional Office, Bangkok, is manned by the Assistant Executive Secretary (Dr. Betty del Rosario), a Liaison Officer (Mr. P.K. Saha) and an Office Secretary (Ms. Urairat Rujirek). Further, APAARI has initiated two specific programs, namely, APARIS operating from APAARI Secretariat and APCoAB, located at ICRISAT office, NASC, Pusa Campus, New Delhi with Dr. J.L. Karihaloo as its Coordinator.

APAARI Executive Committee meeting

An Editorial Committee is designated to prepare and review APAARI publications including the regular APAARI Newsletter, which currently has about 300 subscribers. Short-term consultants are commissioned for special assignments under the direct supervision of the Executive Secretary.

IV. MEMBERSHIP

APAARI Grows; Membership Diversifies

APAARI is a self-sustaining organization since its establishment. Its activities are conducted from the resources largely generated through its membership that has gradually increased over the last decade and presently represents 38 members. As per APAARI Constitution, these members listed in Box 2 are categorized as follows:

- **NARS Members (20)**- these are national agricultural research institutions/ councils/ organizations/ universities; from South-West Asia, South Asia, South-East Asia, East Asia and the Pacific Island countries and Oceania.
- **Associate Members (13)**- these include nine CGIAR Centers/IARCs, and three other International Centers and one Regional Center;

APAARI members represent NARS, regional and international organizations

- **Reciprocal Members (5)**- these are some regional organizations/ associations/networks.

Thus, APAARI has gained momentum over the past 15 years of its establishment, and as a regional forum, has build up diverse partnership, utilizing national, regional and international expertise and collective wisdom to attain its goals, as is reflected in the retrospective of its activities, highlighting its achievements.

Diverse partnership constitutes APAARI's strength

Box 2: APAARI membership representing diverse partners
National/Regional/International members

NARS members

West Asia

- Agricultural Research and Education Organization (AREO), Tehran, Iran

South Asia

- Bangladesh Agricultural Research Council (BARC), Dhaka, Bangladesh
- Indian Council of Agricultural Research (ICAR), New Delhi, India
- Nepal Agricultural Research Council (NARC), Kathmandu, Nepal
- Pakistan Agricultural Research Council (PARC), Islamabad, Pakistan
- Sri Lanka Council for Agricultural Research Policy (CARP), Colombo, Sri Lanka

South-East Asia

- Malaysian Agricultural Research and Development Institute (MARDI), Kuala Lumpur, Malaysia
- Department of Agriculture (DoA), Bangkok, Thailand
- Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Los Baños, the Philippines
- Bureau of Agricultural Research (BAR), Diliman, Quezon City, the Philippines
- Ministry of Agriculture and Rural Development (MARD), Vietnam

East Asia

- Japan International Research Center for Agricultural Sciences (JIRCAS), Tsukuba, Japan
- Rural Development Administration (RDA), Suwon, Republic of Korea
- Council of Agriculture (CoA), Chinese Taipei

Pacific Island Countries & Oceania

- Australian Center for International Agricultural Research (ACIAR), Canberra, Australia
- National Agricultural Research Institute (NARI), Lae, Papua New Guinea
- University of Technology, Papua New Guinea
- Koroniva Research Station, Ministry of Agriculture, Forestry and Fisheries (MAFF), Fiji
- Ministry of Commerce, Forests and Fisheries (MCFF), Apia, Western Samoa
- Institut Agronomique Neo-Caledonien (IAC), New Caledonia

Associate Members

- AVRDC – World Vegetable Center (Chinese Taipei)
- CIMMYT – International Maize and Wheat Improvement Center (Mexico)
- ICARDA – International Center for Agricultural Research in the Dry Areas (Syria)
- ICBA – International Center for Biosaline Agriculture (United Arab Emirates)
- ICIMOD – International Center for Integrated Mountain Development (Nepal)
- ICRISAT – International Crops Research Institute for the Semi-Arid Tropics (India)
- IFPRI – International Food Policy Research Institute (U.S.A.)

- ILRI – International Livestock Research Institute (Kenya)
- IPGRI – International Plant Genetic Resources Institute (Italy)
- IRRI – International Rice Research Institute (the Philippines)
- IWMI – International Water Management Institute (Sri Lanka)
- UNESCAP-CAPSA – Center for Alleviation of Poverty through Secondary Crops Development in Asia and the Pacific (Indonesia)
- WFC – World Fish Center (Malaysia)

Reciprocal Members

- AARINENA – Association of Agricultural Research Institutions in the Near East and North Africa (Jordan)
- AIT – Asian Institute of Technology (Thailand)
- APAFRI – Asia-Pacific Association for Forestry Research Institutions (Malaysia)
- APSA – The Asia and Pacific Seed Association (Thailand)
- NACA – Network of Aquaculture Centers in Asia-Pacific (Thailand)

V. PERSPECTIVE PLAN AND VISION 2025

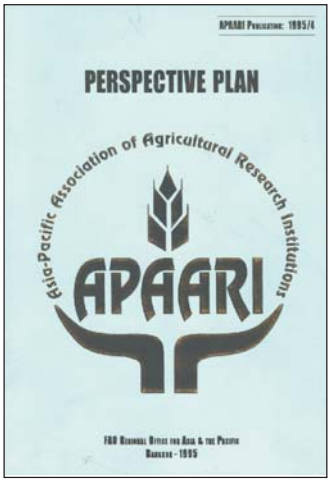
In pursuance of its goals, APAARI effectively planned its activities for agricultural research for development broadly in two phases: developing a perspective mid-term plan for five years (1995-2000) during 1994-95, and its vision 2025 – for long-term plan to be pursued 2000 onwards, keeping in view the overall sub-regional/regional needs and global R&D scenario, and flexibility to discuss reprioritization of activities/programs.

Perspective Plan meeting held at Bangkok, 1994

1. Perspective Plan (mid-term 1995-2000)

To streamline its objectives and functions, APAARI developed in 1994-95 its Perspective Plan which provided a blue print for its development in the medium-term. This was presented at the Third General Assembly meeting in November 1994, and got approved. The Plan reinforced collaborative relationships among institutions and advocated networking of activities to support and complement national efforts in improving agricultural research for development in the region, and to address relevant issues. APAARI, thus, worked out strategies to ensure that it is able to address and provide directions to achieve its goals by implementing the following tasks:

- Regional collaboration/networking in priority programs
- Human resource development
- Policy advocacy
- Resource generation, and
- Publication enhancement



2. Vision 2025: Long-term Plan

The mid-term perspective plan provided the desired direction and accordingly, diverse activities were initiated and undertaken by APAARI, as per strategies worked out. However, it was realized that over this period 1995-2000, several developments have taken place within NARS' vis-à-vis global/regional agricultural scenario. There has been significant paradigm shift and some timely interventions were required to broaden APAARI's vision, considering the challenges of the region, status of the NARS and NARS-NARS and inter-institutional collaboration and cooperation among partners, and to develop programs addressing the emerging role of new sciences (ICT, biotechnology, PHT, etc.) and shift in policy advocacy. Further, APAARI's focus on ARD thrust must address poverty alleviation and food security, while aiming at agricultural sustainability. To achieve these targets along with the objectives laid out in the perspective plan, the strategies were revised looking at APAARI's long-term perspective in regional context. Thus, APAARI during August 1999 had organized at New Delhi, a brainstorming meeting to discuss its Vision 2025. Subsequently, this was further discussed during the Executive Committee meeting of APAARI held at FAO RAP, Bangkok from 29 November to 1 December 1999, and later published and widely circulated.

Expert Consultation to develop APAARI Vision 2025

The APAARI Vision 2025 is as follows:

"Agricultural Research for Development (ARD) in the Asia-Pacific region is effectively promoted and facilitated through novel partnerships among NARS and other related organizations so that it contributes to sustainable improvements in the productivity of agricultural systems and to the quality of the natural resource base that underpins agriculture, thereby enhancing food and nutrition security, economic and social well being of communities and the integrity of the environment and services it provides."

APAARI will endeavour to fulfil this vision by building NARS towards sustainable agricultural research for development and effective regional cooperation. It will function as a regional forum to provide a neutral platform for discussion on major research issues/policies. The journey forward for APAARI vis-à-vis Vision 2025 follows an integrated, well coordinated approach in pursuance of its goals and mechanisms (APAARI Vision 2025; published 2000).

VI. STRATEGIES AND PRIORITIES FOR ARD

The Sixth General Assembly of APAARI and the Expert Consultation on 'Strategies for Implementing APAARI Vision 2025: Towards Agricultural Research for Development in the Asia-Pacific Region' held from 8-10 November 2000 at Chiang Rai, Thailand stressed on the importance of ARD priority setting at the national, sub-regional and regional levels involving various stakeholders, such as NARS, ARIs, CGIAR Centers, FAO, IFAD, GFAR other international organizations and NGOs. Three sub-regional meetings were accordingly recommended and planned for South Asia (ICAR, New Delhi and ICRISAT); South-East and East Asia (PCARRD, Los Baños, Philippines and IRRI) and South Pacific (NARI, Papua New Guinea and ACIAR). The following strategies could be identified on priority basis:

- Strengthening regional cooperation and partnership through networking and encouraging the use of new information and communication technology
- Human resource development including improvement of research management
- Advocacy for ARD at the policy level
- Impact assessment and evaluation
- Setting strategic directions
- Ensuring sustainability
- Publication enhancement for technology transfer among NARS

Subsequently, during 2001, APAARI organized three sub-regional meetings on ARD Priority Setting; for West and South Asia at ICRISAT, Patancheru, India; for South-East and East Asia at IRRI, Los Baños, Philippines; and for the Pacific region at Nadi, Fiji. The recommendations of these were further discussed at the Expert

Expert Consultation on ARD Priority Setting by NARS

Consultation held in Bangkok from 12-14 November 2001. This exercise, while analyzing the regional priorities, took note of the common priorities for the sub-regions and as to how best to integrate these with some of the CGIAR Challenge Programs (CPs). It also emphasized that in viewing this, the role of regional networks is also to be examined critically and efforts made to bridge the existing gaps.

Based on the above deliberations, seven common areas for research opportunities/ regional priorities could be identified, namely:

- Natural resource management
- Genetic resources
- Commodity chain development (Linking Farmers to Markets)
- Meeting protein needs of growing population – both animal and plant resources
- Tree and forest management
- Information and communication management
- Capacity building.

The specific priority areas are given in Appendix II. The details of the discussions were published in 2002. This publication serves as an important input in the process of ARD planning in the region presenting the sub-regional ARD needs. For South and West Asia another meeting was held at ICRISAT in 2004, and also for other sub-regions in 2005, to assess regional research needs and ARD priorities. Integrating all efforts the broad workable structure of strategies for ARD and the corresponding action plan addressing many of the priorities is given in Box 3.

ICRISAT-ICAR-APAARI Expert Consultation on Agricultural Research Priorities for South and West Asia

Box 3: Strategies for ARD and Action Plan

➢ **Regional Cooperation and Partnership (Collaboration/Networking in Priority Programs)**

- Prioritize/select and support specific programs; promote new initiatives
- Identify centers of excellence
- Establish regional databases; ensure information sharing through electronic connectivity

➢ **Human Resource Development/Capacity Building**

- Sensitize NARS to strengthen HRD
- Identify specific needs for trainings, workshops
- Promote technology transfer

➢ **Policy Advocacy**

- Hold dialogues on policy issues to sensitize NARS vis-à-vis other partners
- Preparing/publishing policy papers and information dissemination

➢ **Publication Enhancement**

- Publication of newsletter, success stories, proceedings of meetings/ consultations, specific status reports for Asia-Pacific, sub-regional/regional emphasis
- Promote public awareness
- Disseminate information widely among members, NARS and other partners

➢ **Resource Generation**

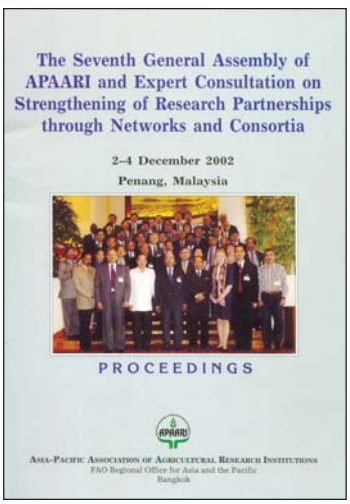
- Enhance APAARI membership
- Facilitate NARS to prepare proposals for donors support
- Diversify donors choice as per proposal/project needs

VII. STRENGTHENING REGIONAL RESEARCH NETWORKS AND CONSORTIA

The Perspective Plan of APAARI developed in 1994, and the Expert Consultation on research priorities in 1996, have laid particular emphasis on regional collaboration/networking of programs focusing on agricultural research for development. To achieve these objectives, APAARI in 1997, organized an 'Expert Consultation on Management and Strengthening of Research Networks in the Asia-Pacific Region' jointly with AREO, Tehran, Iran. The outcome of this meeting resulted in a clear understanding of the agricultural research networks operational in the region among the member countries, the need for strengthening their structure, coordination, and assesses possible ways for their improvement and sustainability. Subsequently, APAARI organized another Expert Consultation during 2001 at Bangkok, to identify the important priorities for ARD.

APAARI First Expert Consultation on Research Networks held at AREO, Tehran, Iran

The common areas of research opportunities included: (i) Natural resource management, (ii) Genetic resources, (iii) Commodity chain development, (iv) Meeting protein demands, and (v) Tree and forest management. Two important cross cutting areas of research opportunities identified were: (i) Information management/access and use for agricultural development; and (ii) Capacity building/human resource development, and research and policy development (food insecurity and poverty).



In order to conceptualize these research priorities into programs, an assessment of the ongoing R&D programs through a well planned gap analysis was conducted based on some of the existing research networks in the Asia-Pacific region. This Expert Consultation on 'Strengthening of Research Partnerships through Networks and Consortia' was jointly organized by APAARI and the World Fish Center, from 2-4 December 2002 at Penang, Malaysia. Also, the progress

of regional research networks was further discussed and assessed in the APAARI Expert Consultations organized at AIT, Bangkok, and FAO RAP, Bangkok during 2003-05.

The following suggestions were offered in organizing future research networks:

(i) NARS must serve as network hubs for ownership by the stakeholders for long-term sustainability;

(ii) Engage development institutions, civil society organizations and the private sector as partners in research networks; and

(iii) Sunset clauses for networks.

Five elements were considered crucial for the success of the networks, namely:

(a) clearly defined objectives,

(b) strong interest of members,

(c) effective coordination,

(d) members committing their own resources, and

(e) sustained external funding.

The challenges of proliferation, sustainability and accountability are glaring realities we face as we move ahead with these networks. Thus, APAARI has made concerted efforts to address the importance of ARD Networks for strengthening agricultural research partnership in the Asia-Pacific region. Research in network mode was considered important for diversification of agriculture.

Regional Research Networks vis-à-vis APAARI's Collaboration

APAARI has been associated with the following more important regional and some inter-regional networks and consortia, providing its role as a facilitator (Box 4).

CORRA : The Council for Partnerships on Rice Research in Asia is supported by IRRI. The CORRA has been meeting regularly and discussing issues relating to IPR, sharing of information, germplasm and other policy matters. CORRA has deliberated on International Treaty on Plant Genetic Resources for Food and Agriculture and also on the role of NARS relating to their involvement in the CGIAR Challenge Program. It also supports the building up of Global Rice Germplasm Database, facilitating technology transfer and information dissemination.

CORRA meeting held back-to-back with APAARI at Bangkok

Box 4: Major Regional ARD Networks Linked/Associated with APAARI*	
• PGR/Agrobiodiversity	AFGRN, ANMAP, APFORGEN, BAPNET, EA-PGR, SANPGR, PROSEA-PGR, PAPGREN
• Crop Improvement	CLAN, CORRA/INGER, INCANA, RWC, TAMNET, TFNet, UTFANET
• Fisheries/Aquaculture	GoFAR, NACA
• Agricultural Growth and Development	ANGOC, ASTI
• Agricultural Biotechnology	APCoAB
• Information Communication Management (ICT/ICM)	APARIS, SAIC
• Capacity building	GCHERA

**For full names see Acronyms and Abbreviations*

APAARI has had active involvement in CORRA activities, participating in its meetings, and vice-a-versa. Some meetings of CORRA have also been held back-to-back with APAARI's Expert Consultations.

CLAN : APAARI has provided continued support to the ICRISAT-based Cereals and Legumes Asia Network which serves as a research and technology exchange network for Asia involving sorghum, pearl millet, chickpea, pigeonpea, and groundnut. Lately, the scope of the network has been enlarged by including legumes such as mung bean and lentil with cooperation of AVRDC and ICARDA. The network has successfully undertaken exchange, testing, and use of germplasm and breeding material and human resource development to upgrade research skills of NARS scientists. CLAN is an active network and APAARI participated in its meeting held in the Philippines recently. It proposes to further expand its activities in Central Asia (see Chapter X).

CLAN meeting held recently in the Philippines

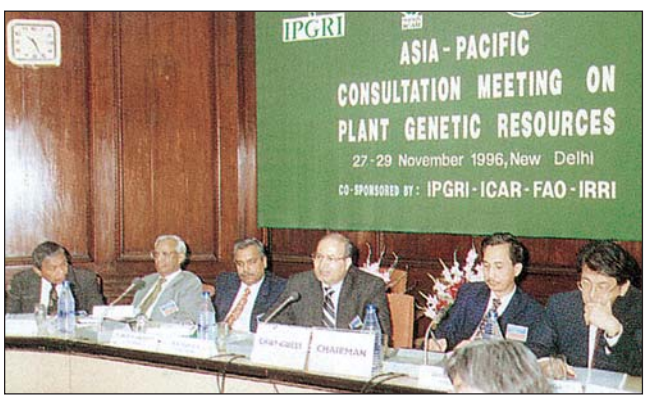
RWC : The Rice-Wheat Consortium is an eco-regional initiative of the CGIAR involving the NARS of South Asia, namely, Bangladesh, Nepal, India and Pakistan, the IARCs and Advanced Research Organizations. The activities are commendable, being coordinated by Facilitation Unit at CIMMYT India office. RWC activities address the issues of productivity enhancement of rice and wheat in a sustainable manner. The major focus of RWC is to address concerns of tillage and crop

establishment, water, nutrient and pest management, socio-economics and policy issues. APAARI is appreciative of RWC activities and has been collaborating with it during its meetings. APAARI has brought out a success story highlighting its work on resource conservation technologies and their impact/benefits to farmers in the Indo-Gangetic Plains.

GoFAR : APAARI has been instrumental in the establishment of Group on Fisheries and Aquaculture Research (GoFAR) network by the International Center for Living Aquatic Resources Management (ICLARM), now named as the World Fish Center (WFC), realizing its important role and complementarity with other networks such as the International Network on Genetic Resources of Aquaculture (INGA). The priority areas for research collaboration has been identified and thrust provided for genetic improvement of various fish breeds and for wider knowledge dissemination among member NARS. APAARI would also be providing support to GoFAR activities to make it more sustainable as the network is serving a very useful purpose.

UTFANET : The Underutilized Tropical Fruits Asia Network is supported by ICUC that presently operates from Colombo, Sri Lanka. APAARI has been inviting ICUC to its meetings to address its concern on promoting research on underutilized fruits in the region and felt that the Center in future will be able to play an important role in partnership with APAARI and GFAR as well as in collaboration with Global Facilitation Unit on Underutilized Plants established recently at IPGRI. ICUC/ACUC needs to have more active participation of NARS and APAARI in strengthening its activities and developing effective partnership.

PGR networks : APAARI recognizes its increased role in promoting/strengthening plant genetic resources networks in Asia-Pacific region, so well established by IPGRI: four sub-regional networks (RECSEA-PGR – South-East Asia, 6 countries; SANPGR – South Asia, 5 countries; EA-PGR – East Asia, 5 countries; PAPGREN – Pacific, 11 countries) and crop networks (COGENT – coconut global network, 38 countries; BAPNET – INIBAP – banana and plantain network, 11 countries; AFGRN – tropical fruits, 10 countries) and the new PGR networks, such as the Asian Network on Medicinal and Aromatic Plants and Asia-Pacific Forest Genetic Resources Program (APFORGEN). APAARI has linkage with APAFRI. APAARI is a catalyst to improve information-flow and sharing of PGR in the region. APAARI and IPGRI-APO have worked out specific activities to be initiated jointly under the MoU, and this joint collaboration has recently widened to include the



Consultation for identifying key issues relating to PGR in the Asia-Pacific Region

following: implementation of ITPGRFA, with APAARI as facilitator, as is evident from the recently held roundtable conference on this topic, back-to-back with APAARI meeting held at Bangkok during December 2005; developing regional conservation strategies (SSEEA meetings); and more recently, on the Standard Material Transfer Agreement (SMTA) in the meeting organized at Bangkok during April 2006 (*see* Chapter X).

TAMNET : APAARI has been stressing on the importance of Tropical Asia Maize Network that was established with support of FAO RAP, Bangkok, Thailand, and has contributed well to maize improvement during the last decade to meet the growing NARS needs. However, TAMNET activities have gradually receded, and APAARI has also been the main player in the recent initiatives taken jointly by FAO, APSA and APAARI to revive TAMNET. With well-coordinated efforts of CIMMYT Office in Bangkok during 1998 onwards hybrid-maize trials were conducted in different countries and the research findings/materials shared. Based on performance, several tropical yellow maize lines and white maize lines were developed and material distributed to public and private sector. The importance of disseminating single cross maize hybrid technology to the developing countries has been stressed. CIMMYT may play a proactive role and become an effective partner in promoting TAMNET.

Inter-Regional Networks

Some such networks which directly benefit NARS of the region in sharing and imparting technology transfer and/or specific germplasm are as follows:

INCANA : APAARI has actively participated in the establishment of Inter-Regional Network on Cotton in Asia and North Africa (INCANA), as per the recommendation of the Inter-Regional Workshop on Cotton held at Tehran from 12-13 October 2002 with participation of scientists from Azerbaijan, India, Iran, Pakistan, Tajikistan, Turkmenistan, Uzbekistan and Greece. The workshop was co-sponsored by AREO, AARINENA, GFAR, CAC-Forum, APAARI, and ICARDA with AREO, Tehran, Iran providing facilitation function. The network aims at fostering inter-regional collaboration in cotton research and would address issues of common interest through exchange of germplasm, information and expertise in major production-related topics, such as breeding, irrigation management, integrated pest management, fibre quality, marketing, etc. The second meeting of INCANA organized by PFU and ICARDA-CAC was held at Tashkent, Uzbekistan from 6-8 September 2004. It was co-sponsored by GFAR, AARINENA, CACAARI and APAARI. It stressed on information and germplasm exchange, INCANA regional varietal trials, collaboration amongst networking countries in hybrid cotton research, integrated pest management (IPM), Bt cotton and cotton-wheat rotation. Also, two travelling workshops have been organized on: (i) hybrid and Bt cotton in India from 21-26 November 2005, wherein APAARI supported and facilitated the participation of Iran; and (ii) IPM in August 2006 in Syria, wherein APAARI sponsored participation of one expert each from India and Pakistan.

Biosaline Networks : The International Center for Biosaline Agriculture (ICBA) has provided ARD collaboration on two networks, namely, Global Biosaline Network (GBN) and Inter-Islamic Network on Biosaline Agriculture (INBA). ICBA has been particularly appreciative of APAARI's role in ensuring regional support. Also biosaline research is specific, and salinity tolerance and crop improvement assumes importance in the semi-arid tropics of South Asia/India. Thus, sharing of information and research findings of these networks will benefit concerned NARS in the Asia-Pacific.

TFNet : The International Tropical Fruits Network based in Malaysia aims to: (i) promote sustainable development of the tropical fruit industry globally in relation to production, consumption, processing, marketing and international trade, (ii) provide an easy access to updated global information on tropical fruits, and (iii) strengthen research partnership in the region. APAARI is concerned that this program is further facilitated for benefit of the Asia-Pacific NARS, particularly when this region holds rich diversity in indigenous and well acclimatized, widely adapted exotic diversity. APAARI recognizes the importance and more active involvement of IPGRI, ICUC/ACUC, and UTFANET.

Further Considerations/Concerns

These networks have been serving very useful purpose and must be further strengthened as well as supported, especially through active involvement of concerned NARS, including APAARI and CGIAR Centers/IARCs, APAARI, for NARS benefits, will also collaborate with other specific organization such as AVRDC for promoting regional vegetable networks. The main concern is for better funding support to these networks and APAARI intends to facilitate such needs through initiatives taken by networks in active collaboration with concerned organizations. Presently, APAARI and other support organizations as facilitators are concerned about the sustainability of networks, review of existing networks and if required their restructuring. Overall APAARI is mindful on the benefits being received by member NARS through networks and how best their future needs could be served by promoting such regional and international collaboration, also involving the private sector. In this context, through APAARI's initiatives, two more networks have been established and are actively contributing towards the application of agricultural information/ICT, ICM (APARIS) and agricultural biotechnology (APCoAB) – dealt with in details separately in Chapters VIII and IX, respectively as APAARI's specific programs. Two more networks, namely, on Post-harvest Technology and Natural Resource Management are in the pipeline. A regional *ad hoc* working group has been recently organized to prepare a regional partnership program on linking farmers to markets which will form part of a global partnership program facilitated by GFAR. Also, the Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC) has recently proposed an Asia-Pacific NGO ARD Consortium for GFAR's support (*see* Chapters X and XI).

VIII. STRENGTHENING AGRICULTURAL INFORMATION AND COMMUNICATION MANAGEMENT: APARIS ACHIEVEMENTS

Background Information

With an aim to promote the use of new information and communication technologies (ICT) for better information and communication management (ICM) in agricultural research for development (ARD) of the Asia-Pacific region, APAARI has been developing and maintaining the Asia-Pacific Agricultural Research Information System (APARIS) since 1999. APARIS serves as a regional de-centralized platform for efficient information and knowledge sharing among the region's national agricultural research systems (NARS) and other ARD stakeholders. In this regional knowledge network, NARS are represented by their respective national agricultural information systems (NAIS or national nodes). APARIS also acts as a regional node linking NAIS to global networks (such as WAICENT, AGRIS, WISARD, ASTI, AROW, etc.) and other regional agricultural information systems (RAIS) such as InfoSys+, AARINENA-RAIS, Agroweb-CAC, FORAGRO-RAIS and FARA-RAIS.

APAARI recognizes that the successful functioning of APARIS depends largely on information content and data standards of its national nodes or NAIS. Therefore, a bottom-up approach is being adopted in developing APARIS. The National Agricultural Information Officers of NARS contribute regularly in APARIS development. APARIS is partially supported by ACIAR and GFAR, and it has its own Steering Committee which meets regularly and directs the technical program.

Activities Undertaken vis-à-vis Achievements

A brief account of APARIS development phases and progress over the past five years since its establishment as a specific program under APAARI is presented here (information mainly abstracted from ICT status report recently published by APAARI).

• APARIS Phase I (1999-2002)

Main components of APARIS

APARIS, being web-enabled, is closely integrated with the APAARI website (http://www.apaari.org/). The following are seven main components of APARIS at present:

1. *Management Information System (MIS) Tools*: *Regional Research Networks (RRNs) Database*: This database currently has information on major regional research networks, and it continues to develop in order to cover all the networks that effectively operate at both the regional and the sub-regional levels (i.e., South Asia, South-East Asia and the Pacific). Some examples of RRNs included in this database are NACA, APAFRI, INGER, COGENT, the Regional Network on Plant Genetic Resources, CLAN, CORRA, the Rice-Wheat Consortium and others. This database also provides access to the websites of the RRNs, and to the information resources that these networks offer such as the NARS Database; Regional Associations Database; ARD Projects Database; Daily Agriculture News; Database on Agricultural Research and Development Indicators. Also, APARIS provides access to ASTI (Agricultural Science and Technology Indicators) project of IFPRI.
2. *Information on regional events related to ARD and to ICM*: This component provides two databases, namely, meetings and events related to ARD and ICM; this database also covers APAARI activities and events, and provides general information on scientific and technological events that are being organized by stakeholders in the region, and ICM training activities in the region.
3. *Facilitate access to scientific publications generated by agricultural research in the region*: Provides access to all APAARI publications; expert consultations, success stories and others as posted on APAARI website.
4. *Electronic forums to facilitate dialogue among stakeholders of ARD in the region on issues of strategic importance*: Access to the following electronic forums was provided and is presently available through the APAARI website: Electronic Forum on Information and Training Requirements in the Asia-Pacific region; Access to the EGFAR-NARS Forum; Specialized Thematic Electronic Forums.
5. *Gateway/Portal services*: Various portals linked through APARIS include the following: Portal to Regional Research Networks (RRNs) to facilitate access to the websites of the Regional Research Networks that operate in the region; Portal to the websites of NARS Institutions in the Asia-Pacific region; Portal to Web-enabled information on key topics/themes of ARD; Intelligent Gateway or Portal Facility. A pilot project was formulated with some initial help from CABI to develop an Intelligent Gateway or Portal Facility to information resources on the web that will provide a very important additional service.
6. *Strengthen knowledge networks on ARD in the APAARI region*: (i) facilitating access to the information resources of Regional Research Networks (RRNs): In collaboration with the consortium of institutions that participate in the RRNs identified in the RRN Database, information can be provided on what data/information is available in the research organizations that constitute each RRN (i.e. NACA, APAFRI, INGER, Rice-Wheat Consortium, etc.); (ii) pilot project on the Development of Knowledge Networks in specific areas of ARD.

7. *Dissemination of information through APAARI website and publications:* The objective of this component of APARIS is to: (a) facilitate dissemination of the results of APAARI activities through the APAARI website, through publications and through CD-ROMs, and (b) facilitate access to other relevant publications related to ARD in the region. This is an important activity that has been integrated into the regional strategy to implement the APAARI Vision 2025. The following components have been developed:

(i) *Provide general information on APAARI* (nature, objectives, mandate, members, activities, etc.). This is done in a special section on APAARI website ('About APAARI'), from where all the important documents of APAARI can be downloaded (such as mission statement, Vision 2025, constitution, members, etc.).

(ii) *APAARI publications and CD-ROMs*: A CD-ROM with 25 Success Stories has been released recently.

(iii) *Access to other ARD publications*: Access to interesting topics, and relevant papers and publications on agricultural research for development that are produced by other partners (i.e. the CGIAR, development agencies, etc.) are also made available through the APAARI website.

First ICT Expert Consultation meeting

• APARIS Phase II (2002-2006)

After the successful completion/achievements of Phase I as presented above and realizing that a general APARIS framework was in place, APAARI in October 2002, organized the second ICT Expert Consultation on further development of APARIS. An APARIS steering committee was formed to provide policy support, undertake strategic planning, provide overall technical guidance, source external funds, and monitor the progress of APARIS work plan. The steering committee in its first meeting in October 2002 reviewed and accepted the terms of reference (ToR) for NINPs which were developed during the expert consultation. The ToR of NINPs include the following functions:

- Assess the status and needs of respective NARS with regard to ICT in ARD
- Monitor and update information to improve relevance and effectiveness of APARIS contributions to APAARI vision and mission

- Identify, collect, organize and make accessible information systems within the subject scope of APARIS
- Establish and operate information services for national and regional clientele based on APARIS processed information

ICT Expert Consultation on developing APARIS Phase II

- Share skills, knowledge and experiences in handling and management of information among NINPs

Linking of APARIS with other regional, sub-regional and global agricultural information systems, and functional enhancements or value addition in it emerged as the priorities for its future development.

Developing Regional and International Collaboration/Identifying Support Group

As a followup of the recommendations of the second ICT expert consultation in April, 2003 APAARI organized a meeting to formalize the bilateral cooperation between APAARI and the members of its support group in the area of ICT (FAO, GFAR, ISNAR and AIT). This exercise resulted in identification of specific areas of collaborative activities that synergize the resources of support group members and APAARI.

Activities identified for Phase II

With regard to the Phase II developments in APARIS, the following activities were identified and some of them are already completed:

1. *Development of a Regional Agricultural Expert Locator (RAEL) on APAARI website*: Currently NINPs serve as links between APARIS and the member NARS for sharing information of general nature. This new initiative, RAEL, is aimed at creating multiple input points (within a NARS) for APARIS. RAEL will maintain a database of agricultural experts and their profiles. The database will be populated by interested experts themselves. The RAEL function has three main modules: (i) Expert-Profile Module: The profile of each expert will be maintained in this module, which will have restricted access and only registered experts will be able to manipulate their respective profile records; (ii) Research-Data Module: This module will maintain a database of the past and present

research/consulting projects, publications, presentations and professional activities of the experts; and (iii) Search Module: This will be accessible to all and it will provide results using both the above modules.

2. *A simplified gateway function on APAARI website using open source software*: The APARIS gateway function, consisting of a search module, will act as a multi-host search engine to locate ARD information resources on the internet within the APAARI member institutions. In August 2003, NINPs were requested to provide brief summaries and URLs of digital information resources available in their respective NARS. The gateway function has a search module where a user can enter keyword(s) and get the search results based on it. During the search process, the gateway will perform following actions: connecting to the APAARI member institution's servers; searching the requested keyword in each web file; retrieving the information from the selected file(s); saving the meta-data information in an internal database of the function to reduce the search time in future, and displaying the search results in a standard XML format to the user.
3. *ICT need assessment of member NARS to develop better capacity building programs*: National Information Nodal Points (NINPs) of APAARI members participated in an ICT need assessment survey and prepared a status report for their respective NARS. These reports were analyzed by APAARI and formed a basis for initial development of APARIS. To make the results of this survey widely available, APAARI subsequently published in 2004, a benchmark report entitled "Information Communication Technologies in Agricultural Research for Development in the Asia-Pacific Region: A Status Report."
4. *Redesigning, link validation and update of APAARI website*: The main objective of this activity is to check and update the site content, ensure validity of linkages from APAARI website, and search and add new relevant links at appropriate places. An APAARI CD has been developed to provide the APAARI website as an off-line resource to those who lack adequate internet connectivity. Copies of *APAARI on CD* have been distributed to APAARI's diverse stakeholders. This has now become an annual publication of APAARI. Along similar lines, *NARS on CD* is also published, which provides a detailed directory of NARS institutes of the region in a user-friendly searchable format.

5. *Linking of APARIS with agricultural information systems developed by GFAR, FAO, CG Centers and other regional, sub-regional and national agencies*: APAARI considers further strengthening of member NINPs a priority for potential linking of APARIS with agricultural information systems of NARS as well as those of

sub-regional and global organizations through the proposed GLOBAL-RAIS project of GFAR. The APAARI expert consultations provide NINPs an opportunity to become familiar with the development and management aspects of a distributed information system as envisioned under the GLOBAL-RAIS initiative and also applicable to APARIS. In this respect, APAARI is also benefiting from the experiences of other organizations, such as AARINENA, FARA, FORAGRO and EFARD.

6. *Training workshop on capacity building for developing National Agricultural Information Systems (NAIS) of Cambodia, Laos, Myanmar, Bhutan, East Timor, Mongolia and Vietnam*: APAARI organized a training workshop at AIT, Bangkok from 3-13 August 2004 in collaboration with GFAR, AIT, FAO, UNESCAP-CAPSA, SDLEARN and JIRCAS/NARO, to assist NARS of the above mentioned countries by training their appropriate officers in ICM and building NAIS. During the workshop, trainees were assisted in defining their respective NAIS and in developing prototype websites of their respective NARS as a delivery medium for NAIS. Significant amount of training material, including video-recorded lectures on key topics, has been collected and organized in web-based and CD-based formats. This training material will be further developed as an e-Learning tool in collaboration with AAACU, SDLEARN and others for future sub-regional and national training programs under APARIS. Possibilities of using internet-based video conferencing tools to deliver training modules are also being explored as more and more countries are joining APAN (Asia-Pacific Advanced Network). The Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB), a new APAARI initiative, will develop training modules covering subject areas such as agricultural biotechnology and biosafety. Such modules as well as educational materials developed in collaboration with AAACU could also be delivered through APARIS.

ICT training workshop for developing NAIS

7. *A national workshop on linking farmers with researchers through ICT*: In order to deliberate on emerging issues, a workshop on 'Role of ICT in Taking Scientific Knowledge/Technologies to the End Users' was organized from 10-11 January 2005, at New Delhi by the Trust for Advancement of Agricultural Sciences (TAAS), India, National Academy of Agricultural Sciences (NAAS), India, Asia-Pacific Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand and Indian Society of Agricultural Statistics (ISAS), New Delhi, India. This workshop clearly highlighted the need for access to value added

information/knowledge dissemination through a well coordinated national system (stressed on establishing NAIS) so that farmers gain through ICT networking and are linked to national, regional and global markets for better value of their products in order to get higher income and come above poverty scenario. It also stressed on capacity building of extension functionaries for the transfer of knowledge dissemination to the end users/ farmers.

National workshop on role of ICT held in New Delhi

8. *Regional/inter-regional consultations*: The Expert Consultation on 'Strengthening Regional Agricultural Information System: Role of ICT in IRD' was held from 1-3 December 2003 at the Asian Institute of Technology (AIT), Bangkok. Apart from diverse participation from Asia-Pacific region, representatives from regional agricultural fora of West Asia and Africa also participated. The workshop emphasized on the need of using conventional and new ICT together for information and knowledge sharing vis-à-vis role of APARIS in improving the efficiency and effectiveness of the information and knowledge flows related to agriculture in the Asia-Pacific region, with greater role of National Information Nodal Points (NINPs).

9. *Training Workshop on Integrating NAIS*: In continuation of APAARI's efforts to build further capacity for improved information exchange and communication in agricultural research in the region, APAARI/APARIS organized a training workshop on Integrating National Agricultural Information Systems (NAIS) at AIT, Bangkok from 1-5 November 2005. The workshop recommended further development of APARIS integration tools through Regional Agricultural Expert Locators (RAEL) and Regional Agricultural Information Gateway (RAIG) and also developing some success stories on ICT.

ICT training workshop for developing NAIS

10. *Inter-regional cooperation for ICT and ICM in ARD*: In July 2006, APAARI organized an inter-regional workshop on 'Advocacy and inter-regional

Workshop on inter-regional cooperation in ICT/ICM for ARD

cooperation for information and communication technologies/management in agricultural research for development' at AIT, Bangkok with GFAR's support. The workshop's objectives were to: (i) identify the role of regional fora (RF) in the emerging global alliance for ICT and ICM in ARD through their Regional Agricultural Information Systems (RAIS); and (ii) develop collaborative activities of RAIS, such as APARIS, AARINENA-RAIS, FARA-RAIS, InfoSys+, AgroWeb, CAC-RAIS, and FORAGRO-INFOTEC. The workshop was also an opportunity for the new AGRIS Task Force on Advocacy to discuss with RFs the future direction and actions. The workshop was attended by 21 participants from various RFs, selected Asia-Pacific NARS, GFAR, FAO, and representatives from other international initiatives on ICM for ARD.

11. *Selected success stories on agricultural information systems*: With partial support from GFAR and ACIAR, APAARI has published a collection of success stories and best practices of ICT and ICM in ARD. In addition to a descriptive list of several current initiatives on agricultural information systems, the publication provides two different case studies—one on linking farmers with the researchers (RDA, South Korea's Agricultural Information Service) and the other on linking farmers to markets (India's e-Chopal initiative).

Emerging Concerns/Issues

Need to prioritize ICT use in ARD and further sensitize NARS

The common issues that still emerge at NARS level in enabling ICT use in ARD, based on discussion held in the APAARI Expert Consultations are:

- How to prioritize ICT use in ARD for maximum effectiveness? In view of financial and skills constraints, should the focus be on ICT use in scientific and technical information, research data management, research management, extension and outreach, agricultural education and enabling communication between institutions and/or researchers.
- What should be the strategy to provide NARS institutes with appropriate infrastructure, focus on generation of digital content for NARS clients and develop computer use, ICT and ICM skills.

APARIS Highlights

- APARIS, an ACIAR and GFAR funded initiative of APAARI, has been active since 2000, promoting information communication technologies and management (ICT/ICM) in agricultural research for development (ARD) to support agricultural knowledge management and dissemination in Asia-Pacific region. The thematic areas of APARIS activities include advocacy, capacity building and integration of information resources.
- Under these themes, APARIS has conducted three expert consultations, two short-term training programs, and an inter-regional workshop on advocacy for ICT/M in ARD. More than 200 participants from various national, regional and international organizations have taken part in these activities. APARIS training programs have trained national agricultural information officers of 15 NARS of the Asia-Pacific region. APARIS has published the proceedings of the experts consultations, one status report, and is currently publishing 'Selected Success Stories on Agricultural Information Systems.'
- APAARI website, managed by APARIS, makes available these as well as all other APAARI publications in user-friendly formats. APARIS is also actively involved in annual CD-ROM publications such as 'APAARI on CD' and 'NARS Directory on CD', targeting users in some developing countries of the region, who take adequate internet connectivity. Through APAARI web site, APARIS also provides services such as Regional Agricultural Expert Locator (RAEL) and Regional Agricultural Information Gateway (GAIG), and links to web sites of APAARI members, collaboration and diverse stakeholders of ARD.

[APAARI Newsletter Vol. 15, No. 1, June 2006].

Addressing heterogeneity in ICT/ICM among NARS

There is great heterogeneity in ICT/ICM development among NARS in the Asia-Pacific region. This enormous disparity, to a considerable extent, interferes with collaboration and coordination, and APARIS is trying to educate weaker NARS (APARIS has grouped NARS in order of NAIS development – *see* Box 5). The principal role of ICT in ARD is to integrate information content to satisfy the needs of agricultural communities and participants in agricultural commodity chains, connecting people who generate and use innovations and enable learning at individual, household and community levels. The use of ICT also enables breaking of conventional institutional, geographical, disciplinary, commodity and similar boundaries in the exchange and sharing of information, knowledge, skills and resources. The use of ICT enables NARS to strengthen existing linkages and bringing new forms of linkages. They are also enabling evolution of 'agricultural innovation systems' at various levels and in replacing the current NARS-centric approaches in ARD and giving rise to something new in sharing and exchanging innovations globally. Regional collaboration and cooperation for ICT management and ICM hold great promise in contributing to agricultural development in the region.

Box 5: Grouping of NARS in descending order of NAIS development					
Group A	**Group B**	**Group C**		**Group D**	
Australia	China	Bangladesh	Papua New Guinea	Afghanistan	Laos
Chinese Taipei	India	Fiji		Bhutan	Mongolia
Japan	Pakistan	Indonesia	Sri Lanka	Cambodia	Myanmar
Malaysia	Philippines	Iran	Vietnam	E. Timor	New Caledonia
South Korea	Thailand				

Innovative use of ICT in agriculture and rural development

Several countries in Asia are seeing very innovative use of ICT in agricultural and rural development. India leads the pack with more than 57 per cent of all ICT enabled rural initiatives in the region in that country; with 4 per cent each in Pakistan, Thailand, Malaysia, Philippines, Bangladesh and others; 3 per cent in China; 2 per cent each in Cambodia, Indonesia, Nepal, Sri Lanka; 1 per cent each in Bhutan, Vietnam, Japan and Laos and four countries outside the region–Israel, Russia, America, Jordan (data from Digital Dividend Website).

Future Activities/Priorities

In view of the above emerging issues, the APARIS future plan focuses on three broad themes: advocacy, capacity development and integration of information resources. The deliberations during the third meeting of Steering Committee of APARIS held on 8 August 2004 prioritized these activities as follows:

a. **Advocacy** for enabling, enhancing and enlarging agriculture related information systems at national, sub-regional and regional levels in the Asia-Pacific region

(i) Collecting, collating and providing access to information, on a biannual basis, related to status of ICT use and information systems in NARS of the region and agriculture and rural development related ICT use indicators at national and regional level

(ii) Developing an advocacy paper on ICT and agricultural information related policy and strategy issues at national, sub-regional and regional level that can provide fact-based support for advocacy role of APARIS

(iii) Organize, during APAARI General Assemblies, a half-day sensitization and awareness workshop on policy and strategy issues in enabling, enhancing and enlarging agricultural information systems for senior NARS and agricultural policy makers and managers

(iv) Develop CD on NARS; publish success stories on ICT/ICM in ARD using case studies from selected NARS. A success story is being published based on Indian and Korean experiences

(v) Associate and network with other initiatives and fora to promote awareness about ICT/ICM in ARD and also publicize APARIS in the on-going forums such as AFITA and APAN conferences

b. Capacity development for ICM and use of appropriate ICT for national agricultural information systems

(i) An Asia-Pacific Regional Workshop for NINPs for need assessment and to evolve a framework for National Agricultural Information Systems

(ii) Three sub-regional training workshops for NINPs and two ICT/ICM trainers from each country: (i) South and West Asia (Iran, Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh, Sri Lanka) in collaboration with SAIC, Bangladesh; (ii) South-East Asia (ASEAN countries) in collaboration with SEARCA, Philippines; and (iii) the Pacific (APAARI member countries) in collaboration with SPC, Suva, Fiji.

(iii) National workshops, facilitated by NINPs and trained NAIS trainers–two officers from each major national agricultural institutes.

c. Integration of information resources within NARS, in the Asia-Pacific region and with other regional and global agricultural information systems such as the GFAR webring

(i) Develop an on-line compendium of good practices, standards, guidelines, protocols, etc. for agricultural information exchange and sharing in the Asia-Pacific region

(ii) Participate, as a representative of the Asia-Pacific Region's NARS, in negotiations related to setting of standards, guidelines, protocols to agricultural information systems at the global level

(iii) Conduct seminars at sub-regional levels - South Asia, South-East Asia and the Pacific countries - related to sharing and exchange of information, especially on the use of standards, guidelines and best practices in agricultural information systems in conjunction with the sub-regional training workshops proposed in the capacity development section and other APAARI related activities

(iv) Further strengthen the directory of agricultural information on the web and the Gateway/Portal function to access the information resources of various institutes

(v) Promote data and information sharing among various member institutes using applications such as MetBroker and localized crop models

(vi) In consultation with GFAR and other regional and sub-regional fora, integrate APARIS as Asia-Pacific node in the Global Webring of Agricultural Information Systems

Based on the suggestions of APARIS Steering Committee, and to achieve desired goals, APAARI will seek support of GFAR and other potential donors/focal points, organizations such as FAO RAP, ACIAR, AIT, JIRCAS/NARO, CABI, and SDLEARN.

IX. STRENGTHENING COLLABORATION IN AGRICULTURAL BIOTECHNOLOGY: APCOAB's ACHIEVEMENTS

Introduction

The Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) was established in 2003 under the umbrella of APAARI. Its genesis is linked to three meetings organized by APAARI during 2002-2003 to discuss the status of agricultural biotechnology in the Asia-Pacific region, and the need for such a consortium to provide regional coordination to undertake and promote this program for the benefit of NARS and the farming community. APCoAB is located at ICRISAT office in NASC, Pusa Campus, New Delhi office. Apart from APAARI, its activities are supported by Rockefeller Foundation, Monsanto, Mahyco, GFAR, JIRCAS and ACIAR.

Meeting on establishment of APCoAB

APCoAB's mission is *"To harness the benefits of agricultural biotechnology for human and animal welfare through the application of latest scientific technologies while safeguarding the environment for the advancement of society in the Asia-Pacific region"*.

APCoAB's main thrust is to:

- Serve as a neutral forum for the key partners engaged in research, development, commercialization and education/learning of agricultural biotechnology as well as environmental safety in the Asia-Pacific region.
- Facilitate and promote public awareness and understanding relating to important issues of IPR, *sui generis* systems, biosafety, risk assessment, harmonization of regulatory procedures, and benefit sharing in order to address various concerns relating to adoption of agricultural biotechnology.
- Facilitate human resources development for meaningful application of agricultural biotechnologies to enhance sustainable agricultural productivity as well as product quality for the welfare of both farmers and consumers.

Activities/Work Plan

The APCoAB Steering Committee Meetings held during 2003-2004, initially deliberated on developing a road map of activities for APCoAB strategic areas and to prioritize these for its work plan. Subsequently, Steering Committee meetings during 2004-05 refined these further. The major focus has been on the following activities:

- Facilitate access to and transfer of proven biotechnologies backed by adequate measures on biosafety, awareness and adoption
- Public awareness and information sharing regarding benefits and concerns on biosafety issues of genetically modified organisms
- Ensure developing appropriate institutional mechanisms for testing and release of biotech products
- Create new public-private research partnerships
- Convince national policy makers regarding potential benefits of agricultural biotechnology to the society
- Identify/promote problem-solving research
- Capacity building/HRD through consultations, conferences, public fora, workshops and specific training
- Enhance publication of NARS, regional findings for knowledge dissemination and technology transfer.

This is further illustrated in the diagram (Box 6). As APAARI program, APCoAB takes up these activities in a phased manner through its annual work plans as per national/regional needs and collaboration with NARS, IARCs, private sector and other institutions.

Major Achievements

APCoAB, though a relatively young program under APAARI initiatives, has gradually build up its activities in a phased manner and its achievements are quite impressive.

Website redesigned and updated

Initially, APCoAB website was established as a link to APAARI website. This website is now directly operated by APCoAB office in New Delhi, which besides giving updates on APCoAB activities provides information on current research and development in agricultural biotechnology, particularly in the Asia-Pacific region. The website can be visited at www.apcoab.org. The site provides several useful links as well as databases on various Asia-Pacific institutions, and on scientists/experts involved in agricultural biotechnology. It acts as a resource-base for collaboration among NARS of the region in particular. Information on meetings organized has been posted on the website alongwith other information abstracted from published literature. More webpages are under construction in order to provide value-added information.

Box 6 : Strategic areas and priorities for APCoAB

Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB)

Research
- Service oriented facilitation role
- Research prioritization involving all stakeholders
- Promotion of Ag-biotechnologies through partnership initiatives

Policy
- Policy issues relating to testing, release and biosafety of GMOs and other biotech products
- Policies for the exchange of technology and biotech products

Strategic Areas

Capacity Building/HRD
- Facilitate public awareness
- Conduct training programs/ awareness campaign
  - Imparting new technology
  - Biosafety, bioethics and related issues
  - IPRs, patenting and benefit sharing

Knowledge Dissemination
- At all levels based on scientific assessment and validation
- Providing links to relevant websites
- Enhance publication for information dissemination, technology sharing

Publications

APCoAB published the following documents during 2005-2006.

- Revised brochure on APCoAB as public awareness material.
- Proceedings of Brainstorming Session on Public-Private-Partnership in Agricultural Biotechnology: Highlights and Recommendations.
- Based on R&D initiative of the national program, an updated account on transgenic maize in the Philippines has been brought out. The publication is entitled 'Commercialization of Bt Corn in the Philippines: A Status Report'.
- The research and development work carried

out on Bt cotton by the public and private institutions in India and its impact has been well synthesized in a recent publication entitled 'Bt Cotton in India – A Status Report'.

These publications have since been widely distributed to collaborators and concerned scientists/organizations.

Workshops organized

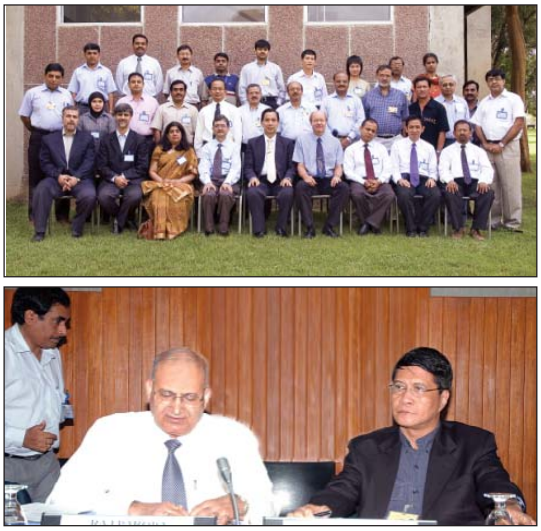
APCoAB had organized/facilitated following workshops since its establishment during the last three years:

- Dialogue on 'Enabling regulatory mechanism for release of transgenic crops', organized by Trust for Advancement of Agricultural Sciences (TAAS), New Delhi, India, 18 October 2003
- Brainstorming Session on 'Enabling Regulatory Framework and Procedures for Promoting Agricultural Biotechnology in the Philippines', organized by PCARRD, Los Baños, Philippines, 19 November 2003
- Workshop on 'Enabling Regulatory Framework and Procedures for Promoting Agricultural Biotechnology Developments in Thailand', organized by National Center for Genetic Engineering and Biotechnology (BIOTEC) & National Science and Technology Development Agency (NSTDA), Bangkok, Thailand, during February 2004
- Workshop on 'Public-Private Partnership in the Use of Agribiotechnology for Sustainable Solutions to Brassicas Pest Problems' jointly organized by AVRDC/APAARI/APCoAB/CIMBAA at India Habitat Center, New Delhi, India, 10 February 2005
- Brainstorming Session on 'Public-Private Partnership in Agricultural Biotechnology' held at NARS Complex, New Delhi, India, 14 March 2005. A clear message that emerged was the need of a mutual trust between the public and private sector, that developing countries should come out with a national strategy on public-private partnership identifying the specific priority areas of cooperation between the public and private partners; need for a macro-level policy change and a well-defined mechanism for IPR and benefit sharing, using existing models of partnership;

Brainstorming Session on Public-Private Partnership in Agricultural Biotechnology

also capacity building in the field of scientific policy and legal matters.

- High level policy dialogue on 'Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges' jointly organized by FAO, APAARI and GFAR- facilitated by APCoAB at Bangkok, Thailand from 7-9 November 2005.
- Workshop on 'Biosafety Regulations for Transgenic Crops and the Need for Harmonising them in the Asia-Pacific Region' jointly organized with ICRISAT at Patancheru during 31 July – 2 August 2006. The workshop recognized that modern biotechnology is a powerful tool for agricultural improvements, and can help in alleviating hunger and malnutrition. Developing appropriate measures for safe application of the technology in compliance with the Cartagena Protocol on Biosafety would facilitate sharing of its benefits among the stakeholders in the Asia-Pacific region. The workshop expressed a general consensus that the countries should move towards identifying issues that need harmonization at the regional level while recognizing that every country would have their own regulations and stand on the subject. A strong need was felt for capacity building in selected areas as per priority. Both national and regional initiative, would be required to operationalise the recommended actions. It was also recommended that APCoAB should play a leading role in networking and dissemination of information on agricultural biotechnology and biosafety in the Asia-Pacific region.



Workshop on Biosafety Regulations for Transgenic Crops

Future Activities

Among the activities proposed as per annual work plan, some of which have already been initiated and will be operated/completed during 2006, namely:

- Compile information on Directory of Agricultural Biotechnology related institutes and experts in the Asia-Pacific region
- Enhancing human resource development meeting priority needs of NARS
- A training program on 'Molecular Aided Selection for Crop Improvement', is being proposed to be jointly organized with IRRI, at Los Baños, Philippines.

The following publications are in the pipeline:

- Three Status reports, namely, 'Micropropagation of potato', 'Micropropagation of sugarcane' and 'Micropropagation of date palm', are being technically reviewed for publication.
- Status report on 'Bt cotton in China' is being finalized.
- APCoAB has offered to publish 'Biotechnology Case Studies in the Pacific' written by the scientists of the Pacific region. The draft manuscript received from Dr. Mary Taylor, Advisor, SPC is being edited and processed for publication.

Besides the above activities, information is being collated on biosafety regulations of the Asia-Pacific region. Status of individual countries on development of biosafety framework is being compiled for distribution among both public and private institutions and the national regulatory authorities of the region. Further, the Fifth Steering Committee meeting of APCoAB held on 5 June 2006 at Bangkok, Thailand, has stressed that besides conducting activities within the Asia-Pacific region, APCoAB should also pay attention to developing inter-regional linkages in order to see if a GPP on biotechnology could be established under the umbrella of GFAR with required funding support. More collaboration, networking is envisaged for conventional and new emerging technologies. In this context, APCoAB will also develop collaboration with International Center for Genetic Engineering and Biotechnology (ICGEB), Asian Maize Biotechnology Network (AMBIONET), regional institutes, such as Asian Institute of Technology (AIT), and with selected national institutes to coordinate activities at national level, such as with National Research Center on Plant Biotechnology, New Delhi; National Center for Engineering and Biotechnology (BIOTEC) Thailand; Center for Research in Biotechnology in Agriculture (CEBAR), Kuala Lumpur, Malaysia Biotechnology Coalition of the Philippines (BCP), Institute of Biotechnology and Molecular Biology, Manila, Philippines; National Institute of Agricultural Biotechnology, Suwon, Korea; National Research Center for Genetic Engineering and Biotechnology, Tehran, Iran; Agricultural Biotechnology Institute, Islamabad, Pakistan; Biotechnology Research and Training Institute, Hanoi, Vietnam.

X. BROADENING REGIONAL COLLABORATION: FACILITATING NEW ACTIVITIES

More recently, as per specific needs, APAARI widened its role to collaborate with IPGRI to assist in assessing NARS, sub-regional and regional commitments towards developing 'Regional Conservation Strategy', and implementing the International Treaty on Plant Genetic Resources for Food and Agriculture. APAARI also collaborated with IFPRI for information synthesis on recent investment trends in agricultural research in the Asia-Pacific region. Highlights of these activities which have regional importance and the implications are given.

PGR Related Issues: IPGRI/APAARI Collaboration

South-Southeast-East Asia (SSEEA) Regional Conservation Strategy developed by IPGRI, endorsed by APAARI

The strategy aims to promote and assist in the development of an effective and efficient arrangement for the conservation of the most important crop diversity collections in the SSEEA region, those identified in Annex I of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), an activity funded by 'The Global Crop Diversity Trust', an independent and internationally funded body established in 2003.

The SSEEA regional conservation strategy which was favourably endorsed by APAARI was developed by IPGRI through a consultative process which started in October 2004 in Beijing, China. This was followed by second consultation held in Kuala Lumpur, Malaysia during September 2005. In between these two major consultations, IPGRI-APO facilitated the inputs of the national programs through the three PGR sub-regional networks and consolidated the outputs into a SSEEA Strategy document. The process involved the participation of the major stakeholders at the national, regional and international levels. APAARI, FAO RAP, Asia-Pacific Association of Forest Research Institutions (APAFRI) and CGIAR Centers (IRRI and ICRISAT) participated. A Steering Committee composed of representatives of the three sub-regional PGR networks, APAARI, FAO RAP, IPGRI, IRRI, and ICRISAT guides the development and finalization of the SSEEA regional strategy. The most important aspects of the SSEEA strategy are:

- Identification of the most important crops in the region, mostly the crops covered in Annex I of the ITPGRFA (rice, citrus, Asian beans/*Vigna,* eggplant, wheat, maize, banana, barley, sorghum, coconut, potato, sweet potato, cassava, and yams).

- Identification of collections of greatest importance deserving first priority for support.
- Identification of the main areas of collaboration: (a) documentation, (b) maintenance, (c) regeneration, (d) safety duplicates, (e) quarantine, (f) distribution, and (g) characterization.

The coordination and facilitation of the strategy at the national level in the countries/NARS in the SSEEA region is done by the Country Coordinators who deal with plant genetic resources in their respective countries. The coordination at the sub-regional level is done by the Chairs of the three PGR sub-regional networks to be assisted by the IPGRI-sub-regional secretariats.

For a regional system of conservation to be efficient and to ensure links to users, the system has to be under the aegis of a formal regional inter-governmental organization such as the ASEAN and FAO, or a regional forum such as APAARI, with existing crops/PGR networks. The CGIAR Centers with its base in the region or Centers which have the mandate for the priority crops such as IRRI, ICRISAT, CIMMYT, CIP, and others, will have to play both a lead and supportive role in these various collaborative activities. (*Source:* P. Sajise and R. Rao - APAARI Newsletter Vol. 14, No.2, December 2005; IPGRI-APO Newsletter No. 48, September-December 2005).

Implementation of ITPGRFA in the Asia-Pacific region

IPGRI, in collaboration with APAARI, held a roundtable meeting of NARS leaders and other stakeholders in Asia-Pacific on 10 November 2005 in Bangkok, specifically to: (i) heighten awareness among the participants of the Treaty implementation process at international and national levels, (ii) recommend activities to develop harmonized regional approaches to outstanding implementation issues, and (iii) identify modalities for the delivery of technical assistance to countries in the implementation of the International Treaty (IT). The participants represented APAARI member institutions (NARS and CGIAR Centers), FAO and NGOs.

Roundtable meeting on ITPGRFA

The meeting emphasized the importance of countries' participation in the implementation of the Treaty. The Treaty provides a supportive framework for PGRFA-related research and conservation efforts and ultimately to improving the livelihoods of the poor farmers. It was part of a larger package of complementary activities that should be pursued jointly, including the implementation of the Global Plan of Action (GPA), the finalization of the 'Regional Conservation Strategy' being developed for the Global Crop Diversity Trust and the strengthening of regional genetic resources and crop networks (as given above).

The meeting resulted in the following recommendations:

- National Agricultural Research System (NARS) representatives should push for more constructive engagement within their own organizations and countries concerning the ongoing processes of the implementation of the Treaty. Where appropriate, they should contact their national representatives for further implementation of the Treaty and the regional representatives attending the Contact Group meetings.
- The Asian Group of delegates to the Contact Group should meet before the next meeting of the Contact Group to discuss options and further define their positions on issues that are being addressed at the Contact Group meetings. It was further recommended that APAARI Secretariat should examine, with the Regional Chair of the Asian Group, the possibility of such a meeting with some financial support from IPGRI and possibly other sources.
- There is a need for national level technical legal assistance for the implementation of the Treaty. To that end, participants endorsed a joint FAO/IPGRI program for technical assistance to countries to implement the Treaty.

Following the recommendations of this roundtable meeting, APAARI in collaboration with IPGRI facilitated a meeting of the seven Asian representatives nominated by the chairs of the FAO Regional Groups for the drafting of the Standard Material Transfer Agreement (SMTA) on 15-16 April 2006 at Bangkok. The process led to common understanding to develop SMTA which would have greater implications on APAARI/NARS for dealing with exchange and benefit sharing of genetic resources in the future. Dr. Rashid Anwar from Pakistan was the Chair of the Asian SMTA Contact Group. The meeting resulted in preparing a well coordinated Asian position needed for negotiation during the SMTA Contact Group meeting held in Sweden from 24-28 April 2006. Further, based on the outcome of the Sweden meeting, the first meeting of the Governing Body of the ITPGRFA held in the second week of June 2006 has finalized the Standard Material Transfer Agreement. (*Source:* APAARI Newsletter Vol. 15, No.1, June 2006; Michael Holewood, G. Moore and P. Sajise, APAARI Newsletter Vol. 14, No. 2, December 2005; Michael Halewood, IPGRI-APO Newsletter No.48, September-December 2005).

Agricultural Science and Technology Indicators (ASTI) Initiative

Recent investment trends in agricultural research in Asia and the Pacific

During 2003-2005, IFPRI in close collaboration with APAARI conducted an Agricultural Science and Technology Indicators (ASTI) survey in 15 Asian and Pacific countries. APAARI assisted in providing contact information of the various national partnering research agencies. It also assisted in setting up the in-country collaboration.

The findings for the nine Asia-Pacific countries sampled (Bangladesh, Laos, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, and Vietnam) showed that:

- During the 1990's, total agricultural R&D spending grew at an average of 3.2 per cent per year. This was considerably higher than experienced in other regions in the world such as Sub-Saharan Africa (0.8 per cent), Latin America and the Carribean (2.0 per cent), and OECD countries combined (1.2 per cent) during the same period. But this average growth rate masks considerable variances among the nine countries which comprise only about half of the agricultural R&D investments in the region (excluding China and India).
- Agricultural research conducted by the government agencies in Asia is mainly funded through contributions by the government, whereas investments by the private sector are quite limited. In most countries these funds were provided through direct budget allocations, but some countries received additional government funding through competitive funding mechanisms.

The findings of the complete ASTI survey in all the 15 Asia-Pacific countries will be published and made available through both the ASTI and APAARI websites. APAARI will also work with ASTI to disseminate the country briefs, regional reports and datasets within the region.

The ASTI initiative involves a network of various national, regional and international partners. It has been the most authoritative source of internationally comparable data and analyses, which are required by the policy makers to make informed decisions to improve the efficiency and impact of agricultural research. For the Asia round of survey, a schedule of activities has been framed and an endorsement of ASTI-APAARI MoU to implement survey in more than 20 Asian countries was solicited. (*Source:* N.M. Beintema, APAARI Newsletter Vol.14, No. 2, December 2005).

GFAR/APAARI Initiative on Linking Farmers to Markets

Asia-Pacific prepares for Global Partnership Program on Linking Farmers to Markets

Realizing the importance of Linking Farmers to Markets (LFM), APAARI and GFAR had jointly convened a planning workshop on 6-7 June 2006 at Bangkok, of an *ad hoc* Regional Working Group (RWG) for the preparation of Asia-Pacific's participation in a Global Partnership Program (GPP) on Linking Farmers to Markets (LFM). The workshop participants included representatives from the NARS, advanced research academic institutions, private sector, farmers' organizations, NGOs, and regional financial and development institutions. The LFM program envisions 'enhanced livelihoods of rural households and farming communities by providing opportunities of choice for market integration through responsive R & D'. The RWG agreed on the four components of the LFM program: information (and documentation), cluster and linkages, responsive R&D, and training. The specific operational details have yet to be formulated. An inter-regional meeting is also being convened by GFAR. The GFAR shall consolidate the regional outputs into a Global Partnership Program on Linking Farmers to Market which is expected to take off in 2007. (APAARI Newsletter, Vol.15, No. 1, June 2006). Further, APAARI will deliberate on this theme holding an expert consultation on LFM during its General Assembly meeting at New Delhi from 6-8 November 2006.

Ad hoc Regional Working Group meeting on LFM

An Inter-Center Collaboration Relating to CLAN Activities

The Cereals and Legumes Asia Network is actively collaborating with its partner-NARS and other collaborative organizations in carrying out its program and has recently organized its 8th Steering Committee Meeting in the Philippines co-sponsored by ICRISAT, ICARDA, AVRDC and APAARI. CLAN membership consists of 13 countries in Asia, namely, Bangladesh, China, India, Iran, Indonesia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, Vietnam, and Yemen. ICRISAT, AVRDC, ICARDA and other regional and international institutes in the Asia-Pacific region are a part of the network, providing genetic material, technology and research information and training input.

The expanded CLAN in now co-facilitated by ICRISAT, ICARDA and AVRDC. The coordination unit is located at and supported by ICRISAT, Patancheru. APAARI has committed support to help sustain the network activities. A joint inter-center proposal on 'Crop diversification with food legumes for improving income and nutrition of rural poor and sustainable productivity of cereal-based cropping systems in South and Central Asia', with target countries Bangladesh, Pakistan, Tajikistan and Uzbekistan for ensuring funding support to CLAN has been prepared for submission to IFAD. Apart from ICRISAT, ICARDA and AVRDC, APAARI and concerned NARS, selected NGOs from these countries have also been involved as partners (*Source:* C.L.L. Gowda, ICRISAT, APAARI Newsletter Vol.14, No.2, December 2005; and Personal communication, information abridged from concept note received).

Creation of an NGO Consortium for ARD in the Asia-Pacific

The Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC) has proposed the creation of an NGO Consortium for ARD in the Asia-Pacific. The Consortium aims to facilitate linkages of NGOs working on sustainable agriculture towards poverty alleviation with public sector institutions at the national level, like the NARS and with APAARI; GFAR and other international organizations like the IARCs. A meeting of small group may be convened by ANGOC during the APAARI General Assembly meeting at New Delhi from 6-8 November 2006/GFAR Conference from 9-11 November 2006. The event may mark the launching of this new consortium.

XI. OVERALL REGIONAL THRUST: HARNESSING ARD FOR NARS NEEDS

Major Achievements

As already emphasized, APAARI's diverse activities as per its mission and objectives are complementary to NARS needs and priorities vis-à-vis overall regional collaboration in agricultural research for development in the Asia-Pacific region. The progress on the activities planned as per strategies for implementing Vision 2025 in particular, superimposing the mid-term perspective plan vis-à-vis regional priority setting have been dealt with here, highlighting major achievements of APAARI during the past 15 years since its establishment. During this period, APAARI has emerged as a strong regional forum with a focus on harnessing agricultural research for a better future (Box 7).

> APAARI since its establishment has made significant achievements. It has played a very constructive role by bringing in an element of cooperation among NARS in the region. The regular meetings, expert consultations and workshops have resulted in finding suitable solutions to agricultural problems and further strengthened inter-NARS/IARCs and other collaborative partnerships. The achievements in developing regional collaboration and networking, policy advocacy, resource generation and publication enhancement are highly impressive.

It needs to be emphasized that APAARI, unlike some of the other regional/sub-regional organizations, is in a very unique and advantageous position of having members that come from some of the poorest to some of the richest countries of the world. Depending on the stage of growth of NARS, APAARI facilitates building up of NARS, helps in carrying out functions of implementation, research programs, coordination, policy formulation and technology transfer, commercialization and information dissemination. Thrusts on promoting and strengthening R&D initiatives are as follows:

1. Promoting Regional Cooperation and Partnership

Strengthening Regional Networks

APAARI plays the role of a facilitator/catalyst to promote and coordinate activities of regional research networks, and this topic has already been dealt with separately, as one of major activities of APAARI (*see* Chapter VII).

Box 7: APAARI emerges as a strong Regional Forum: 15 years of development 'Harnessing ARD for NARS Needs'

- Proactive, dynamic, growth-oriented with bottom up approach and strongly NARS driven, with membership of diverse stakeholders; 20 member NARS, 13 international/regional organizations as associate members, 5 as reciprocal members.
- Trust builder for NARS consistently adopting GFAR principles of inclusiveness and subsidiarity, promoting diverse partnerships, rich expertise and knowledge-base in all fields to strengthen ARD initiatives; involving member NARS, CGIAR Centers/IARCs, FAO, GFAR, ACIAR, JIRCAS, NGOs, farmers/farmers' organizations and more recently, the youth (YPARD).
- Building a think-tank with changed mind-set among NARS with its role as a catalyst, to debate on diverse ARD issues and prioritize research areas at regional/sub-regional and national level.
- Keeps track of fast development in ARD to meet new challenges through strategic areas of research and prioritization of activities; has organized over 20 expert consultations on diverse topics mainly of regional concerns, for NARS benefits.
- Promoting effectively the exchange of scientific/technical know-how and information on ARD; wider-research-base exists for ARD vis-à-vis technology development and transfer.
- Successfully coordinating as facilitator, the regional/sub-regional networks, making these more interactive/effective to cater to NARS needs; supportive of their development and sustainability.
- Providing thrust in knowledge exchange through its unique efforts/ contributions to enhance publication and information dissemination; the only regional forum to have produced over 25 Success Stories on diverse problem-oriented topics, meeting NARS needs for technology transfer/adoption.
- Strengthening new initiatives/programs, namely, on regional agricultural information system and on agricultural biotechnology; upcoming programs on natural resources management and linking farmers to markets.
- Supportive/aware about global interventions, advocates strategies and action programs/activities that match with CGIAR Challenge Programs, CGIAR-/ Science Council priorities and the Millennium Development Goals (MDGs), to address policy issues, poverty alleviation, malnutrition, food security.
- Fosters a culture of learning among members and instills an impact culture among stakeholders.

Organizing Expert Consultations and Meetings

APAARI to date has organized more than 20 expert consultations, meetings on diverse topics/issues of national and regional concerns and to strengthen ARD activities. These cover the following:

- ***Strengthening inter-institutional collaboration***
  - NARS-CGIAR Partnership for Agricultural Research and Development, 1996.
- ***Regional, sub-regional research priorities/strategic planning***
  - NARS Vision towards Future Challenges and Opportunities, 1994
  - Research Priority Setting by NARS in the Asia-Pacific Region, 1996
  - Development of APAARI Vision 2025, 1999
  - Strategies to Implement APAARI Vision 2025, 2000
  - Regional Priority Setting for Agricultural Research for Development in the Asia-Pacific Region, 2001
  - Research Needs Assessment and Prioritization of Agricultural Research for Development in South and West Asia, 2004
  - Regional Synthesis of Research Needs in the Asia-Pacific Region, 2006
- ***Strengthening Research Networks***
  - Management and Strengthening of Research Networks in the Asia-Pacific Region, 1997
  - Strengthening of Research Partnerships through Networks and Consortia, 2002
  - Strengthening Regional Agricultural Information System and Research Networks, 2002
- ***Research management/NARS***
  - Research Management Mechanisms of NARS, 1998
- ***New initiatives***
  - Development of Asia-Pacific Agricultural Research Information System, 2000
  - Development of second phase of APARIS, 2002
  - Establishment of Asia-Pacific Consortium on Agricultural Biotechnology, 2003
- ***Addressing specific/emerging needs***
  - Status of Biotechnology in Agriculture in Asia and the Pacific, 2002

High Level Policy Diologue on Biotechnology for Food Security and Proverty Alleviation held at Bangkok

- Post-harvest Technologies for Ensuring Food Security and Value Addition for Enhanced Income, 2004
- Brainstorming Session on Public-Private Partnership in Agricultural Biotechnology, 2005
- High Level Policy Dialogue on Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges, 2005
- Roundtable meetings on Implementation of International Treaty on Plant Genetic Resources for Food and Agriculture, 2005
- SMTA Contact Group (Asian) meeting, 2006
- Planning Workshop of the *ad hoc* Working Group on Linking Farmers to Markets, 2006

These regional meetings/workshops have been effective in building required partnership for agricultural development in the region.

Collaboration with GFAR

APAARI, as a regional forum for the Asia-Pacific, collaborates with GFAR as one of its regional initiatives in its global and regional activities. It had presented at GFAR-2000 at Dresden, Germany, some case studies in research partnership conducted by NARS with IARCs and other partners. These case studies dealt with regional networks, such as TAMNET, Rice-Wheat Consortium and NACA, and also on Hybrid Rice in India, besides reporting on other regional activities. GFAR management team (GFAR/NARS-SC) participates in APAARI meetings/expert consultations regularly. GFAR is supportive to development of information technology system for the Asia-Pacific region. APAARI participated in the RAIS under Global-RIAS Initiative towards

information sharing in developing ICM for ARD, as per deliberations of the Second International Workshop organized by GFAR in Cairo, Egypt, 10-11 May 2005. More recently, apart from APARIS activities, GFAR has been inclined to promote activities on post-harvest technology and on agricultural biotechnology initiative of APAARI; GFAR is represented on the Steering Committee of APCoAB. It has supported specific regional/NARS activities such as on research needs assessment, priority setting, research gap analysis (Box 12). APAARI is also planning to have a joint followup on PHT Expert Consultation to be organized soon to find out the possibilities if a GPP in this important area could be developed with active partnership of other Regional Fora, under GFAR umbrella. Also, an Inter-regional Network on Cotton (INCANA) has already been established in which APAARI is actively participating with AARINENA and GFAR. APAARI has been earlier represented on NARS-Steering Committee of GFAR. The Chairman APAARI and Executive Secretary participated in the management group meetings of the GFAR and represented APAARI in the recently organized meeting at Marrakech, Morocco on 1 December 2005, and presented a report on APAARI, activities. APAARI is also represented in GFAR's/DURAS Project workshops' evaluation. Recently APAARI and GFAR had jointly organized a planning workshop on 6-7 June 2006, of an *ad hoc* Working Group for the preparation of Asia-Pacific participation in a Global Partnership Program (GPP) on Linking Farmers to Markets (LFM). It focused on developing regional strategy and highlighting some NARS case studies as success stories in LFM such as in the Philippines and India. Overall, the LFM program envisions enhanced livelihoods of farming communities by providing opportunities of choice for market integration through responsive R&D. APAARI (with FAO) will be involved particularly in one of the four components of this program dealing with information and documentation; more specific details will be worked out in the inter-regional meeting to be held on 11-15 September, 2006 at Cairo, Egypt, being convened by GFAR. Presently, APAARI is actively associated in facilitating 3rd GFAR Triennial Conference (GFAR 2006) back-to-back with APAARI General Assembly, deliberating on the topic 'Reorienting Agricultural Research to achieve the Millennium Development Goals'. Also, GFAR is being provided a seat in its Executive Committee. Thus, a very interactive partnership exists between the two fora.

Partnership with CSOs/NGOs

APAARI strives to involve all stakeholders, including CSOs/NGOs in its programs and activities. A number of NGOs and farmers' representatives have taken active part in APAARI meetings (Box 8). More such partnership of representative/established organizations from the region involved in agricultural research for development is envisaged. One seat for CSOs on its Executive Committee is being proposed. Negotiations are currently on for their continued participation in APAARI/ APCoAB/ APARIS related activities. Other modes of partnership with IFAP and ASFARNET are being considered. Also, ANGOC has proposed for an NGO Consortium for ARD in the Asia-Pacific (details given in Chapter X).

Box 8. CSOs participation in APAARI Expert Consultations (2002-2006)

Topic	Date/Venue	Participating Organization
Expert Consultation on the Status of Biotechnology	21-23 March 2002, Bangkok, Thailand	ANGOC-SEA (Philippines), Gene Campaign (India), Forum on Biotechnology and Food Security (India)
Expert Consultation on Strengthening Regional Information Systems and Regional Networks	1-4 December 2003, Bangkok, Thailand	Indian Society of Agribusiness Professionals (ISAP/AgriWatch (India)
Research Needs Assessment and Agricultural Research Priorities for South and West Asia	7-8 October 2004, Hyderabad, India	Perumahan Tanjung Mas Raya (Indonesia), Federation of Free Farmers Coops. Inc. (Philippines), Federation of Farmers Association (India), BAIF Development Research Foundation (India), M.S. Swaminathan Research Foundation (India), INREM Foundation (India), Biostadt M.S. Seeds Ltd. (India)
Expert Consultation on Post-harvest Technologies	1-3 December 2004, Bangkok, Thailand	ITDG (Bangladesh), ASFARNET (Indonesia), Federation of Free Farmers (Philippines), ANGOC (Philippines)
Research Needs Assessment in South-East Asia	27-28 October 2005, IRRI, Los Baños, Laguna, Philippines	ANGOC-SEA (Philippines), Biotechnology Coalition of the Philippines (BCP), ANGAT Farmers Association (Philippines)
High Level Policy Dialogue on Biotechnology	7-9 November 2005, Bangkok, Thailand	Farmers Forum in India, South Asia Rural Reconstruction Association (SARRA, India)
Roundtable meeting on the Implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)	10 November 2005, Bangkok, Thailand	South Asia Rural Reconstruction Association (SARRA, India)

Meeting of Regional *Ad hoc* Working Group on Linking Farmers to Markets	6-7 June 2006, Bangkok, Thailand	Federation of Free Farmers Coops, Inc. (FFF-Philippines), IFAP Asian Committee, Cooperative League of Thailand (CLT), VREDESEI-LANDEN- VECO (Indonesia)
Regional Synthesis of Research Needs	18-19 August 2006 Bangkok, Thailand	Federation of Free Farmers Coops, Inc (FFF-Philippines), IFAP Asian Committee, Cooperative League of Thailand (CLT), Agricultural Cooperative Federation of Thailand (ACFT), ANGOC-SEA (Philippines), Sakeaw Organic Association (Thailand)

Collaboration with private sector/public-private-partnership

More recently, APAARI has widened its activities with more collaboration/ partnership of the private sector. These include APSA's involvement with APAARI in reviewing the TAMNET research network, APSA's representation on GFAR, a major collaborator/supporter of APAARI activities. Realizing the increased role of private sector in biotechnology vis-à-vis sharing of expertise, MONSANTO and MAHYCO are represented on Steering Committee of APCoAB. These organizations are also co-funding its activities. SYNGENTA also participates in APCoAB Steering Committee meetings, programs and possibly will extend support in capacity building/short regional trainings to be organized by APCoAB/APAARI particularly on molecular marker studies and their usefulness.

APAARI envisages increased role of collaborative activities involving public-private-partnerships, particularly in APCoAB activities. As pointed out in Chapter IX, APCoAB had organized a brainstorming session on 'Public-Private Partnership in Agricultural Biotechnology' in New Delhi which was well-attended by the private sector and its recommendations laid stress on national strategy on public-private partnership, identifying specific areas of collaboration. Similar emphasis was laid in the high level policy dialogue on biotechnology for food security and poverty alleviation organized by FAO/APAARI/GFAR and facilitated by APCoAB, at Bangkok from 7-9 November 2005.

Recently, APCoAB has brought out success stories on commercialization of Bt corn in the Philippines and Bt cotton in India, and these highlight the effectiveness of such collaboration further.

Collaboration with FAO and CGIAR/IARCs and other organizations in Regional/International Workshops

APAARI was one of the co-sponsors of the 'Regional Meeting to Promote and Facilitate Implementation of the Global Plan of Action for the Conservation and

Sustainable Use of Plant Genetic Resources for Food and Agriculture in Asia and the Pacific', held at Manila, Philippines from 25-28 December 1998. The meeting was convened by the FAO, APAARI and the CGIAR Systemwide Genetic Resources Program (SGRP). APAARI participated in this workshop and presented a paper highlighting its activities vis-à-vis its role in facilitating GPA implementation. APAARI was also a co-sponsor in the policy meeting organized by IRRI at Los Baños, Philippines in February 2000 on 'Impact on Research and Development of *Sui Generis* Approaches to Plant Variety Protection of Rice in Developing Countries'.

APAARI also participated in the FAO 25th Regional Conference for Asia and the Pacific held in Yokohoma, Japan. Dr Ian Bevege, the then Chairman APAARI particularly invited attention for increase in investment in agricultural research for development and highlighted the role of APAARI as a regional forum for facilitating ARD activities in the Asia-Pacific region. APAARI has also been participating in the FAO meetings held in Rome and at FAO RAP, and the CGIAR Mid-Term meetings.

APAARI participated in FAO RAP regional meetings, in IPGRI/GFU/MSSRF organized specific meeting – the High Level Consultation on Biodiversity at MSSRF, Chennai, India from 18-20 April 2005, and in the Philippines in CLAN meeting, and in the conference organized by the Global Consortium for Higher Education and Research in Agriculture (GCHERA), held from 12-15 September 2005 at Hangzhou, China. Dr. R.S. Paroda, Executive Secretary, APAARI participated in this conference and made a presentation on APAARI activities. He has been elected by GCHERA as an Executive Member for South Asia region. Recently, Dr. Khalghani and Dr. Roozitalab of AREO represented APAARI in the Governing Council meeting of NACA held in Tehran, Iran from 25-28 February 2006. Dr. Betty del Rosario, APAARI Asst. Executive Secretary attended the meeting of the International Federation of Agricultural Producers (IFAP) held on 15 May 2006 in Seoul, Korea. Also, Mr. P.K. Saha, APAARI Laision Officer, participated in the 28th FAO Regional Conference for Asia and the Pacific held at Jakarta, Indonesia from 15-19 May 2006. Opportunity was used to meet Senior Officers from Indonesia, DPR Korea, China, Bhutan and Myanmar, and UNESCAP-CAPSA inviting their institutions to become subscribed members of APAARI.

Successes in R&D partnership/collaboration

As an on-going activity, over the years, NARS have made use of technological advances in agriculture, with a good partnership between NARS-NARS, CGIAR Centers, FAO, other Centers and some examples are cited here (Box 9). APAARI facilitated for NARS, exchange/introduction of some of these through its role in promoting networks, for example, of:

- Baby corn from Thailand to India
- Hybrid rice from China to India and countries in South-East Asia
- Transplanted maize from Vietnam to India

- Tilapia from the Philippines to India and Bangladesh
- Hybrid cotton technology to Vietnam from India
- IPM in rice from Indonesia to India

For several of these, success stories have also been published by APAARI for information dissemination and technology transfer.

APAARI-CGIAR links : The major emphasis has been on collaborative partnership for national and regional benefits utilizing international expertise. Presently, nine IARCs are associate members of APAARI. The CG Centers/IARCs have been well represented in the expert consultations and other meetings organized by APAARI and along with other international organizations, such as FAO, ACIAR, GFAR, JIRCAS have played considerable role in finalizing APAARI's regional priorities and Vision 2025, facilitating networks, and overall providing thrust on ARD in regional context. Some of these collaborative activities are:

- ICRISAT jointly organized with ICAR and APAARI, and hosted the 'South and West Asia Research Need Assessment meeting' in 2004; ICRISAT also organized 'South Asia Integration meeting' earlier in 2001; also ICRISAT has been hosting APCoAB Secretariat at its New Delhi office from 2004; recently, with APCoAB, a joint workshop on 'Biosafety Regulations for Transgenic Crops and the Need for Harmonizing them in the Asia-Pacific Region' was organized from 31 July to August 2006.
- IRRI with DA-BAR and APAARI organized and hosted the 'South-East Asia Priority Setting Sub-Regional meeting' during 2001, 2005; also several CORRA meetings organized back-to-back with APAARI meetings.
- CIMMYT Regional Office initially has been instrumental in collaborative activities on maize improvement, promoting TAMNET activities, CIMMYT's Rice-Wheat Consortium (RWC) has been very active and APAARI has been involved with this network. A success story on RWC has been published by APAARI for NARS benefits.
- ICLARM, now World Fish Center (WFC) has been supportive of the activities of GoFAR, a network on Fisheries and Aquaculture Research hosted by WFC; the center also organized with APAARI and hosted an expert consultation on priority setting in aquaculture, and fisheries R&D during 2001.
- IPGRI and APAARI collaborated in strengthening of PGR activities, APAARI-IPGRI MoU developed in 1998; earlier Expert Consultation on PGR Management jointly organized by IPGRI-APAARI during 1996; recently IPGRI activities related to ITPGRFA, and SMTA facilitated by APAARI in the regional context.
- IFPRI/ASTI-APAARI collaboration has been effective and ASTI has synthesized information based on its survey conducted in 15 countries of Asia-Pacific region.

Box 9: NARS-NARS/IARCs/FAO supported collaboration : Some successes in technological advances in the Asia-Pacific Region*

- Hybrid rice cultivation in China covering almost 18 million ha (54%) of area under rice and contributing around 65 per cent of total rice production
- Oil palm research in Malaysia giving around 6 tonnes/ha of oil yield based on genetically improved materials, thus becoming number one in palm oil production and exporter in the world
- Cultivation of single cross hybrids in maize in China giving 5 tonnes/ha of average yield at the national level and accounting for almost 80 per cent coverage under improved hybrids
- Hybrid cotton covering an area of 2.7 million ha (36.0 per cent to total) in India, thus making export of long staple cotton possible while also resulting in self-sufficiency
- Developing high yielding, short duration and disease-resistant hybrids of sorghum and pearl millet and also of castor and pigeon pea in India
- Developing most productive rice-wheat system in China, India, Pakistan, Bangladesh and Nepal covering an area of over 22.5 million ha
- Developing baby corn hybrids and varieties in Thailand resulting in higher production and export
- Success of transplanted maize immediately after rice in North Vietnam
- Integrated pest management strategy in Indonesia leading to 50% reduction in pesticides and 15 per cent increase in rice yield
- Production and export of tissue cultured orchids on a large scale in Thailand and Singapore
- Promoting a number of high yielding hybrid vegetables (especially cabbage) in South Korea
- Soybean production technology in China, Thailand, South Korea and in India where area under this crop has significantly increased
- Increased production of cotton in Pakistan through improved varieties possessing genes for salt tolerance and earliness
- Developing of true potato seed (TPS) technology and its adoption in India

**Source: Sustaining our Food Security – R.S. Paroda, 2003*

- APAARI organized an Expert Consultation on NARS-CGIAR partnership during 1996; and APAARI members meet CGIAR TAC 69 meeting
- CG Centers participated in APAARI Expert Consultation on Promoting Research Networks and Consortia during 2002; discussed activities of CORRA, PGR networks, BAPNET, RWC, CLAN, GoFAR, TAMNET, APCoAB, APARIS and others; with overall role of APAARI as facilitator.

- Further strengthening of CLAN activities; APAARI facilitates/supports IFAD funded project proposal with joint collaborative role of ICRISAT, ICARDA and AVRDC, to strengthen/expand CLAN activities.
- ICARDA has been supportive of the inter-regional research network on cotton, namely, INCANA. A success story on lentil improvement in Bangladesh based on ICARDA-BARC/BARI initiatives, published by APAARI.
- Future collaboration of APAARI with ILRI (strengthening livestock research in Asia) and IWMI (water management) is envisaged, as discussed in some of the earlier expert consultations held by APAARI.

2. Human Resource Development/Capacity Building

APAARI had been quite supportive of human resource development activities since its inception. A number of training programs have been sponsored by APAARI in area of science and technology.

Collaboration with CABI, ISNAR and ACIAR

Two workshops focusing on information management were organized during November 1999, with APAARI as a co-sponsor.

Harnessing information for development

This workshop was organized by CABI South-East Regional Center in collaboration with the University Putra Malaysia (UPM), Serdang, Malaysia from 15-19 November 1999. APAARI supported participation of six scientists, one each from Nepal, Bangladesh, Sri Lanka, Pakistan, Philippines and Malaysia. Partial support was also provided to one participant from AREO, Tehran, Iran.

Information for agricultural research

This workshop was sponsored by CABI, ISNAR, ACIAR and JIRCAS, and organized at the Asian Institute of Technology (AIT), Bangkok, Thailand from 22-29 November 1999. Three participants each from India and Thailand attended this workshop, apart from some experts.

Collaboration with GFAR, AIT, FAO RAP, SDLEARN, UNESCAP-CAPSA, JIRCAS/NARO and AgriWatch

APAARI organized a training workshop on 'Capacity Building for Developing National Agricultural Information Systems (NAIS) of Bhutan, Cambodia, Laos, Mongolia, Myanmar, Timor-Leste and Vietnam' at AIT, Bangkok, Thailand from 3-12 August 2004. There were 9 trainees from these 7 countries.

Collaboration with JIRCAS

Training on Marker Assisted Selection during March 2005 in Japan – 10 days training supported by JIRCAS; 3 scientists (2 from Thailand, 1 from India) participated.

More activities on HRD for APARIS and APCoAB have been given in Chapters VIII & IX, respectively.

3. Research Priority/Policy Advocacy

APAARI has followed a very directional approach to assess and promote NARS' needs. In 1996, it crystallized the research priorities among NARS of the Asia-Pacific region, moved forward to hold further consultations and critically assess activities/needs of regional crop networks, and overall research management aspects of NARS as already dealt with in the preceding chapters. The following tasks could thus be achieved:

- The NARS could be geared to assess their priorities and plans.
- APAARI could promote NARS activities through their participation in regional networks. It had been quite supportive to their needs.
- APAARI could prepare jointly with NARS, some specific research proposals for donor's funding such as for research networks and its two programs - APARIS and APCoAB. A proposal to support CLAN has been submitted to IFAD.

4. Publication Enhancement

APAARI has been quite proactive in its publication program (Appendix III) and has already received wide appreciation for its diverse publications, which include:

APAARI Newsletter

Two issues yearly are published during June and December each year, providing information on research and development related matters in agriculture including networks, institutes' profiles etc. (Appendices IV & V) in national, regional and global context; highlighting salient activities of NARS, APAARI and other partners. The Newsletter is disseminated widely and serves as an excellent institutional and public awareness material. Starting 1992, till date, 29 issues have been published.

Directories of NARS institutions

Two regional directories for South and South-East Asia have been published. Those for East Asia and the Pacific and Oceania are in progress. Also, such information is being synthesized for regional agricultural information system and institutes/centers on agricultural biotechnology. These database documents will provide to member NARS, useful contacts for exchange of information. Further information on CD on the NARS through APARIS will be updated.

Success Stories on Agriculture and Related Fields

Twenty five Success Stories of significant agricultural breakthroughs in the Asia-Pacific region have been reviewed and published, and widely distributed among members and other partners/collaborators. These cover diverse topics.

- Crops and commodities

  Baby Corn Production in Thailand; Hybrid Rice in China; Hybrid Cotton in India; Palm Oil Industry in Malaysia; Cotton Production in Pakistan; Wheat Production in Iran; Direct-Seeded Rice in Malaysia; Groundnut in China; Oilseeds in India; Lentil Improvement in Bangladesh; Rainbow Trout Culture in Himalayan Kingdom of Nepal; Bt Corn in the Philippines; Bt Cotton in India.

- Farming systems

  Transformation in Korean Farming: Tilapia Farming in the Philippines; Bivalve Mariculture in India; Farming of Carrageenophytes in the Philippines; Resource Conservation Technologies: Transforming the Rice-Wheat Systems in the Indo-Gangetic Plains.

- Disease / pest management

  Integrated Pest Management in Rice in Indonesia; Classical Biological Control of Agricultural Pests in India; New cattle Disease in Village Chickens.

- Other topics

  Dairying in India; Sustaining the Green Revolution in India; Orchids in Thailand; Agro-Tourism in Australia.

These documents stress on inter-institutional collaboration in sharing available expertise and technology among member NARS, to boost their agricultural production and development.

- Expert consultations' proceedings

  So far, APAARI has published the proceedings of the 20 expert consultations as already listed above under sub-head 1 and also listed in chronological order in Appendix III.

- Agricultural research systems

  Two sub-regional reports on South and South-East Asia have been brought out. These present case studies reflecting organization and management, and growth and development of NARS.

- Status report on PGR conservation and use

  This study – a Regional Synthesis Report, undertaken on behalf of the FAO, provides a good synthesis of information on plant genetic resources utilization and conservation in Asia and the Pacific. Also, APAARI has been associated in organizing the Asia-Pacific Regional Consultation on PGR in New Delhi in

Some thematic publications

Some success stories

1996 and in IPGRI's publication of its proceedings which have been brought out jointly by IPGRI, FAO and APAARI.

- NARS' status reports

APAARI has, during 1999, published a synthesis on NARS' organization and management vis-à-vis agricultural R&D scenario in the Asia-Pacific, including the collaborative efforts of the regional networks. It still serves as an information-base on APAARI member NARS, their set-up and R&D activities.

5. Public Awareness, Information Dissemination

APAARI newsletter and other publications are widely circulated, facilitating free flow of information dissemination among member NARS, IARCs, NGOs and other partners including donors. Likewise, other publications are made available to concerned partners and interested scientists, policy makers, etc. APAARI through its publications promotes public awareness on diverse activities/issues of common national, regional and global interest. The mailing list of about 300 addressees is being maintained with the Secretariat that also keeps APARIS database for ICT, and for agricultural biotechnology, such specific database is being maintained by APCoAB at its New Delhi office and information dissemination through its publications is a part of its regular activity as APAARI program.

APAARI PUBLICATIONS

- Newsletter
- Success Stories
- Expert Consultations / Meetings / Workshop Proceedings
- Agricultural Research Systems – Case Studies
- Regional Directories: NARS Institutions
- Perspective Plan
- APAARI Vision 2025
- APAARI Brochure; APCoAB Flyer
- Special Publications/Synthesis on Thematic Topics
- Agricultural Research Priorities for the Asia-Pacific Region
- APAARI on CD, APAARI/APARIS/APCoAB Posters
- ICT in ARD: Status and Progress in the Asia-Pacific Region
- Specific Case Studies in Agricultural Biotechnology (being finalized)
- Micropropagation Techniques, GM Technology Applications (being finalized)
- Biotechnology Case Studies in the Pacific (being finalized)

APAARI on CD

All APAARI publications and reports have been put in electronic format on a user-friendly interactive CD (named APAARI on CD).

APAARI Website

(http://www.apaari.org)

XII. FUTURE CONCERNS

The foregoing account highlights the growth and development of APAARI and its role as a neutral forum. The progress achieved during the past 15 years since its establishment has been synthesized under different activities as per its strategic plan, Vision 2025 and priorities assigned focusing on agricultural research for development in the Asia-Pacific region. Keeping in view the achievements made and concerns exhibited through the SWOT analysis of ARD in the region and also of APAARI, and research gaps identified in the consultations subsequently organized to deliberate on these issues, APAARI activities have been diversified accordingly. The emerging needs also necessitate some flexibility to address such concerns while implementing its vision/action plan. The future ARD thrust by APAARI will focus on further strengthening its activities as follows:

- ***Strengthening NARS:*** There is wide disparity across countries in the size, strength and maturity of NARS, which have grown rapidly over the past two-three decades. Some efforts have been made to reflect this on conceptual basis (Box 10). APAARI needs to re-assess/review NARS needs and prioritize activities based on its vision document and further deliberations, gap analysis, etc. Some of these priorities are:

  (i) Addressing needs of the weaker NARS: The weaker NARS suffer from inadequate institutional support, manpower, resource management and financial constraints. An indepth analysis will be required based on the sub-regional status reports/documents, as within weaker NARS, the needs would vary, though there would be some commonalities such as on HRD/capacity building, and on case-to-case basis, improving their organizational and management skills as well as R&D capabilities. APAARI will continue to play a more directional approach to facilitating scientific and technical cooperation.

  (ii) Identifying/strengthening Centers of Excellence for capacity building among developed NARS: The stronger, well developed NARS serve as knowledge-base centers to impart trainings, etc. at sub-regional/regional level. Their resource capacity and training/teaching facilities will need to be equipped further periodically to serve better regional development of technical and scientific manpower. This can be facilitated by APAARI through international collaboration and donor support. The regional directory of agricultural institutions with their database, may list such specific institutions, particularly those specializing in ICT / ICM, PHT, agricultural biotechnology, molecular biology, genebank management, aquaculture, etc.

Box 10: Evolution/Growth of NARS in the Asia-Pacific Region: Changing Scenario

- Considerable heterogeneity exists among NARS; Australia, Japan, Chinese-Taipei and Korea are far advanced; others are equally well developed, have elaborate ARD set-up, such as India, Pakistan, China, Malaysia, Thailand, Philippines; still others are developing fast, such as Iran, Sri Lanka, Indonesia, Vietnam; and there is gradual build up in countries like Bangladesh and Nepal.
- NARS in most Pacific Island countries are poorly developed in infrastructure/ collaboration which needs improvement. Very few countries have established institutions at the national level such as PNG/NARI; and other research facilities such as research stations in Samoa, Fiji and New Caledonia.
- Increased international and national support to developed NARS has resulted in tremendous transformation of agricultural growth, production and development. R&D programs are well-organized, effective and sustainable with visible impact for national and regional benefits, achievable goals directed to meet MDGs: food security, poverty reduction, sustainability, and overall well-being of farmers.
- Research programs in most Pacific island countries are mainly donor-driven and less sustainable and systems difficult to manage. There is need to develop and establish agricultural infrastructure/ research stations in this sub-region for growth of agriculture and improved livelihood of poor farmers, rural communities. Location specific R&D emphasis is required.
- NARS particularly advanced/developed consist of national/central research facilities, regional facilities and provincial or location-specific research stations. The national research facilities include single-commodity and multi-commodity research. Agricultural Institutions, Universities/Colleges carry out national R&D programs, regional facilities address regional problems in a multi-disciplinary manner, provincial or location-specific stations are involved in fine tuning of technologies to suit specific agro-climatic needs.
- Strong emphasis on human resource development/capacity building with considerable investment; Centers of excellence exist within developed NARS of the region to share expertise and impart knowledge; also, collaborating/ utilizing available international facilities and expertise.
- Gradual expansion of international and national support to agricultural research for development is visible; NARS are playing important role in R&D collaboration within the national set-up providing excellent governance. Well coordinated system prevails with established NARS, but for many others organizational and management skills need to be strengthened.

- Links with other regional and international organizations have considerably increased/improved. NARS with a change in mind-set, more receptive to new technologies, changes in restructuring R&D set-up and to reorient as per national/regional/international needs, and as per NARS capabilities; in advanced NARS, the private sector is now increasingly participating and has made visible impact.

- *Strengthening regional cooperation/partnership:* APAARI has been instrumental in providing thrust to R&D activities of NARS through its improved linkages with national, international and regional organizations, fora, etc. The focus has been to make accessible to NARS, the technological advances / research results achieved by ARI's/IARCs, etc. As APAARI activities and programs get further diversified now, research partnerships need to be widened, equally keeping in view strengthening of APARIS and APCoAB activities. The partnership with CGIAR Centers, FAO, GFAR, ACIAR has proved very effective in materializing APAARI activities in a joint, collaborative mode, particularly on biotechnology, information management, capacity building and policy advocacy. Possibilities of promoting PHT under GFAR/GPP/GPHI will be looked into. Possibilities to form a consortium of NGOs during the forthcoming GFAR Conference at New Delhi are being considered. Also, APAARI has to be proactive in meeting the concerns of CPs, CGIAR agenda, to meet MDGs (Box 11). Further, APAARI has a pivotal role to play in advocating and facilitating technical and organizational support from IARCs and explore possibilities of support from donors such as IFAD, UNDP, UNEP, IDRC, CABI, GEF, World Bank, Global Crop Diversity Trust, ADB, JIRCAS, SDC, BMZ/ GTZ, USAID, Aus-AID, DFID, inwent.
- *Resource generation/increased membership:* APAARI strength has grown by 50 per cent during the past 10 years, increasing its membership to 38 including regular NARS members (20), CGIAR Centers/IARC's, others; international members (13), and some reciprocal members (5). Its current funds amount to US$ 900,000.00 (US dollar Nine Hundred Thousand) available in the APAARI Bank Account. There are some small and large countries who are still not members of APAARI as also, some regional and international organizations. APAARI will strive to approach such organizations for each category of membership. The organizations with resource crunch and needing support/ weaker NARS, can be invited to participate in its activities. Some of these suggestions are: (i) NARS from the region as members: New Zealand, China, DPR Korea, Bhutan, Vanuatu, Solomon Islands, Indonesia, Myanmar (ii) International/regional organizations as associate members and/or as reciprocal members: CIRAD, CABI, ISAAA, ICGEB, SPC, ASEAN, MSSRF, GCHERA, ANGOC, IFAP-SEA, SEARCA, SAARC/SAIC, RIS, BCP.

- ***Strengthening ARD agenda:*** In pursuance of its goals, APAARI's activity-programs will lay importance on ICT/ICM through APARIS and for agricultural biotechnology through APCoAB. For both these programs initiated by APAARI, action plan/activities have been well discussed in several expert consultations and dialogues (*see* Chapters VIII, IX). Similar thrust for another regional program will be on Linking Farmers to Markets (LFM), possibly in collaboration with GFAR. More focus has also to be laid on policy issues related to WTO aspects, IPR, CBD, ITPGRFA, and biodiversity conservation and use, and genebank management with increased collaboration with IPGRI/IPGRI-APO. Further cooperation with CGIAR Centers/IARCs, FAO, GFAR, ACIAR and ICRISAT is envisaged, as also collaboration and support of GCDT and GEF. APAARI's overall emphasis is on ARD for regional needs, keeping in view the special concerns of CPs, CGIAR agenda and the MDGs to contribute effectively to achieve poverty reduction, food security and agricultural sustainability (Box 11).
- ***Partnership with regional/sub-regional Fora:*** Greater concern has been exhibited in strengthening linkages with other regional fora/associations to discuss both sub-regional and regional activities through networking. APAARI has already made headway in promoting inter-regional collaboration such as with AARINENA, CACAARI and FARA. Seeking interface with such fora will be beneficial as problem faced and benefits of experiences gained can be shared as many of the national / regional ARD concerns are common. APAARI plans to develop activities with APAFRI, NACA and APHCA to cover the sectors of forestry, fisheries and livestock. Also, apart from APSA with which APAARI is developing its activities, linkages with sub-regional bodies like SPC, SAARC, ASEAN, SEARCA, will also be pursued.
- ***Strengthening/facilitating collaboration with research networks:*** APAARI is much concerned with the sustainability of regional networks and has been successful in facilitating and/or providing support to their development such as of CLAN. Increased participation, collaboration has to be negotiated on reciprocal basis with ICUC/ACUC, ANSWER and BAPNET, and in the Pacific region with PAPGREN and other programs such as PRAP and SPFDP. New networks under APAARI umbrella for negotiation are LFM and National Resource Management (NRM). APAARI proposes to frame some guidelines on which networks can be supported in future, apart from supporting INCANA. A comprehensive database on networks in which APARIS is engaged, as an ongoing activity, would assist in information dissemination, thereby promoting research and coordination. Periodic assessment on various agricultural R&D networks in the region and their impact would be useful for future planning. In this context, APAARI is concerned in facilitating R&D networks on livestock in Asia-Pacific region with technical help from ILRI, its associate member.

Box 11: APAARI Regional Priorities, Proposed Challenge Programs and CG Systems' Priorities*

Regional Priorities	Challenge Programs	Systems Priorities/ CG Science Council
Natural Resource Management	Water and Agriculture, Desertification, Climate Change, Mountain Agriculture	• Improve water management and use in agriculture • Better management and use of forests and forest landscapes • Better soil and land management and use
Genetic Resources	Climate Change, Biofortification, Global Genetic Resources and Genomics, Mountain Agriculture	• Conserve and characterize genetic resources • Genetic improvement of specific traits • Improve management and use of aquatic resources
Commodity Chain Development	Biofortification	• Improve production and processing systems for high-value commodities
Meeting the Protein Demand	Animal Health and Production, Mountain Agriculture	• Enhance resource-efficient and equitable forms of livestock sector growth
Tree and Forest Management	Water and Agriculture, Desertification, Climate Change, Mountain Agriculture	• Improve water management and use in agriculture • Better management and use of forests and forest landscapes
Information Management	A common issue to all CPs	• A common need
Capacity Development	A common issue to all CPs	• Strengthen national and regional capacities for agricultural research • Policy and institutional innovation to reduce poverty and hunger and to enhance competitiveness of smallholders

** Collectively, these address the Millennium Development Goals, particularly: (i) Eradicate poverty and hunger, (ii) Ensure environmental sustainability, and (iii) Develop a global partnership for development*

- *HRD/capacity building:* This aspect still needs high priority to meet the increasing needs of NARS at sub-regional/regional level, in view of advanced research and technological development in diverse fields. Besides sharing of information and imparting practical knowledge is necessary and training requirements would vary for weaker NARS, and for further capacity building of stronger/developed NARS. Some field requiring HRD/capacity building priority are ICT, agricultural biotechnology, aquaculture, molecular biology, post-harvest technology, conservation biology and seed/plant health care. APAARI needs to facilitate/support such programs in collaboration with international and regional centers, and for such activities identify nodal NARS/ specialized institutes/Centers of Excellence.
- *Partnership with private sector:* In order to achieve the foregoing ARD programs, particularly to plan activities in promoting applications of agricultural biotechnology in the Asia-Pacific countries, a much bigger role of the private sector is envisaged. APAARI will further facilitate links between R&D institutions in the public and the private sector and the NGOs. Increased public-private sector involvement will generate faster use of new technologies and joint collaboration in research and HRD/capacity building with resource generation can be envisaged. APAARI has already successfully initiated Public-Private Partnership (PPP) in APCoAB activities. These need to be extended to fields such as natural resource management, integrated pest management, molecular biology, and advanced plant breeding technologies.
- *Information and communication technology (ICT):* Application of new information and communication technologies presently available is being facilitated by APAARI on high priority and this has been dealt with in Chapter VIII. Further strengthening will be needed for information and knowledge through improved information flows among the stakeholders (improved information systems), as well as access to ICT. Considering the existing gaps and NARS needs, APARIS will further endeavour to facilitate the establishment/ improvement of homepages and link them with the APAARI website. Upgrading of the current APAARI website to function as a regional portal assumes priority as a continuing activity. Also, e-Conferences (or even video conferencing) could be hosted at the APAARI website to promote policy awareness on IPR, CBD, biodiversity and biotechnology. APAARI should then be linked to global information systems (EGFAR, WAICENT). Also, directories of agricultural research institutions in the Asia-Pacific region could be created or updated and maintained on the web preferably in a decentralized manner having each NARS to update its own directory. There are a number of such directories already present on the web such as AROW, WISARD, to which APAARI could link and its member NARS could feed the database. This would be more effective in its linkage to the global knowledge system (Chapter VIII).

Further, networking through e-mail and internet connectivity would enable APAARI members to have access to the best possible knowledge, information and technologies. APAARI through APARIS eventually needs to establish/locate some sub-regional NARS centers to be identified as ICT Regional Centers of Excellence where, apart from the above, HRD activity could be initiated, as also, specialized institutions for capacity building of NARS in the application of GIS technology. Finally, ICT may even be used to address rural development to meet the needs of the rural poor. Some such nodal organizations have already been located (India and Korea) by APARIS.

International support

APAARI, since its establishment, has had very effective partnership and continued support of several international organizations such as FAO/FAO RAP, ACIAR, GFAR, CGIAR/IARCs and JIRCAS. More recently, for several of APAARI activities, particularly in promoting new sciences, co-funding was diversified to include private sector as well, and these activities have been listed in Box 12. Thus, international support to NARS is critical in areas such as ICT/ICM, agricultural biotechnology, natural resource management (including NRM and IPM approaches), post-harvest technology and management. It is also important to recognize the changing balance between the public and private research, participatory research, the increasing role of information in technology transfer to farmers with stronger research/agri-business/extension/farmer to market link. These areas require substantial institutional strengthening and capacity building and APAARI has a pivotal role to play in coordinating these emerging needs of NARS and in advocating and facilitating technical and organizational support from IARCs, FAO, GFAR and donor support from IFAD, World Bank, ADB, UNDP, several bilateral donors and the private sector. In this context, APAARI is equally concerned about raising its professional staff strength to match its program-activities, and to prepare specific proposals for specific donors, for support vis-à-vis better working.

Sustainable agriculture and rural development will remain crucial issues in the region in the foreseeable future. Modern science should function as a stimulus to agricultural transformation and socio-economic development. This challenge has to be effectively addressed by the NARS of each country in the region, with a much stronger commitment.

Looking forward

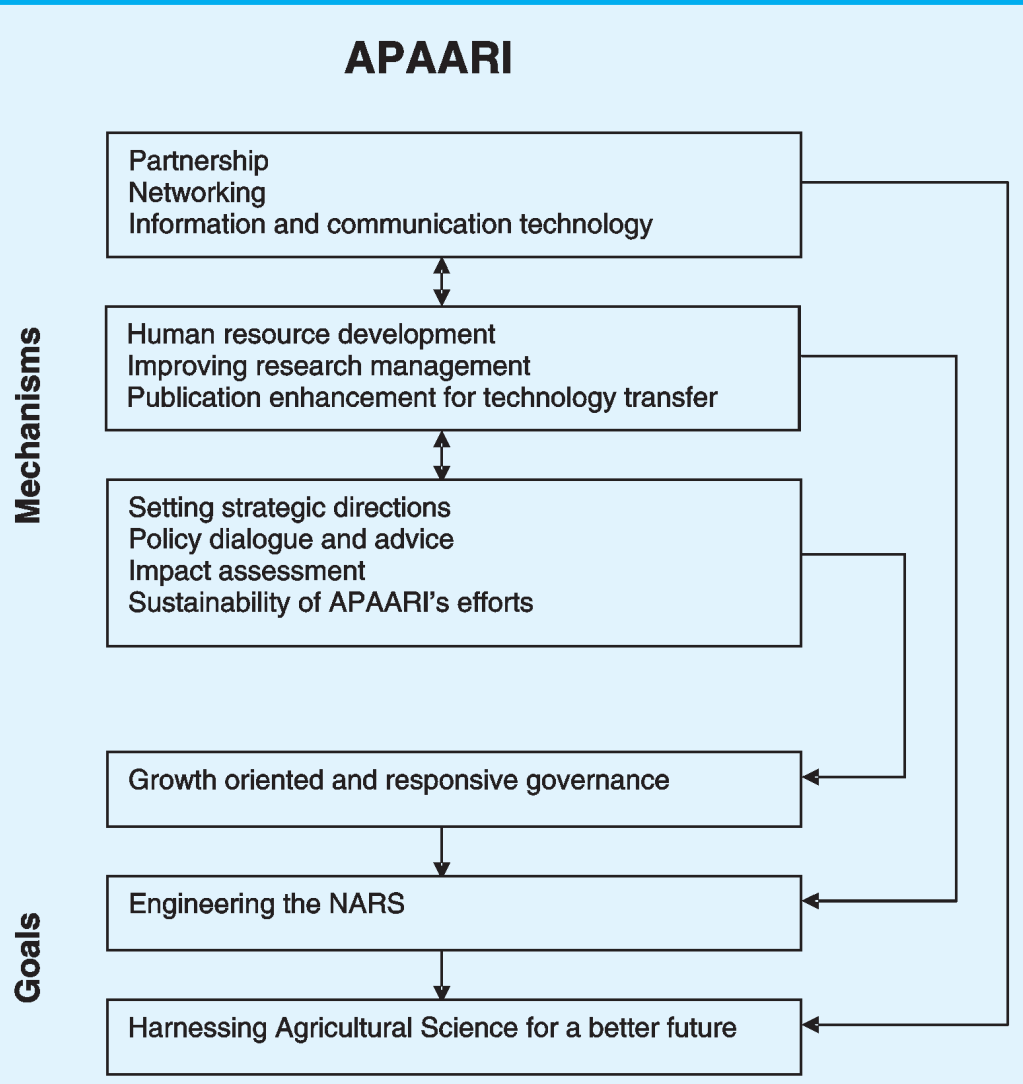
Overall, APAARI's achievements as a vibrant forum have been impressive and its impact and visibility appreciable at national, regional and global levels, as is evident from the details provided in Chapters VII to XI. The future concerns as reflected above are largely part of its ongoing program/activity development, and Box 13

Box: 12 Organizations/establishments which co-funded APAARI major activities (2003-2005)

Program of Work	Funded by
2003	
1. Professional staff for APARIS	ACIAR
2. Expert Consultation on Strengthening Regional Agricultural Information System: Role of ICT in ARD	GFAR
2004	
1. Professional staff for APARIS	ACIAR
2. Expert Consultation on Post-harvest Technologies for Ensuring Food Security and Value Addition for Enhanced Income	GFAR & FAO
3. Training Workshop on Capacity Building for Developing National Agricultural Information Systems (NAIS) of 7 Least Developing Countries	GFAR
4. Workshop on Research Need Assessment for Agricultural Research and Development in South and West Asia	GFAR
5. Support for the operation of APCoAB program	Rockefeller Foundation, MONSANTO, ACIAR, MAHYCO
6. Study tour of 2 Senior Agricultural Scientists to JIRCAS Center, Japan	JIRCAS
2005	
1. Professional staff for APARIS	ACIAR
2. Support for the operation of APCoAB	Rockefeller Foundation, MONSANTO, and MAHYCO
3. Workshop on Agricultural Research Prioritization and Need Assessment for Development in the Pacific region	GFAR
4. Workshop on Research Need Assessment for Agricultural Research and Development in South-East Asia	GFAR
5. High Level Policy Dialogue on Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges	GFAR and FAO

presents the links between its goals and mechanisms (APAAPI Vision 2025) to harness agricultural research for development for NARS' benefit vis-à-vis welfare of the farmers. APAARI shall continue to grow as it strives for more meaningful partnership among its stakeholders.

Box 13: The goals and mechanisms to harness ARD



XIII. EPILOGUE

APAARI was established in 1990, and in 15 years has emerged as a self-sustaining, proactive and dynamic regional forum that fosters closer linkages among NARS, CGIAR Centers, FAO, GFAR, ACIAR, JIRCAS and other regional and international organizations, and several NGOs in the Asia-Pacific region. APAARI's activities as per its mission and objectives are based on its strategies for implementing Vision 2025. It has further refined its priorities at national, sub-regional and regional level, and diversified its activities considerably to meet the emerging needs of NARS. Significant milestones were achieved as it continues to play an important facilitator role in ARD in the region, and these major events are listed in chronological sequence from 1990 onwards (Box: 14).

Box 14: Major milestones–organizational and important ARD events in APAARI: 1990-2006

1990-91	• APAARI established
	• APAARI Constitution developed/adopted by General Assembly (GA)
	• First Executive Committee (EC) in place
1992	• APAARI logo designed
	• Publication work initiated–GA report and first Newsletter published
1993	• APAARI Secretariat established at FAO RAP with Dr. R.S. Paroda as Executive Secretary and Ms. Orawan Liengsermsuk as Office Secretary
1994	• APAARI Perspective Plan/Workplan (1995-2000) developed
	• First Success Story on 'Baby Corn in Thailand' published for information/technology dissemination within NARS
1996	• Research priority setting by NARS initiated
	• APAARI meets with CGIAR-TAC 69
	• APAARI medium-term plan/program developed
1997	• First Expert Consultation on 'Management and Strengthening of Regional Research Networks' organized
1998	• APAARI initiative results in establishment of 'Group of Fisheries, and Aquatic Research (GoFAR)' based at ICLARM
	• IPGRI-APAARI MoU signed to strengthen PGR activities
	• GFAR-APAARI activities strengthened

Box 14: (*Contd.*)

1999-2000	• APAARI Vision 2025 (APAARI Strategic Plan) developed
	• Asia-Pacific Agricultural Research Information System (APARIS) established – an APAARI initiated program
	• Expert Consultation on development of APARIS organized; APARIS Ist Phase in place
2001	• APAARI holds sub-regional meetings; Expert Consultation finalizes regional priorities for ARD; matching/focus on MDGs, CGIAR Challenge Program, New research priorities of CGIAR Science Council (*see* Chapter XII, Appendix II)
2002	• APAARI organized another Expert Consultation on 'Strengthening Research Partnership through Network and Consortia'
	• Expert Consultation on development of Second Phase of APARIS
2003	• Integration of Delhi and Bangkok offices at Bangkok
	• APAARI Constitution revised
	• Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) established–an APAARI initiated program; Secretariat hosted by ICRISAT office at New Delhi
2004	• APARIS/ APAARI publish first status report on 'Information and Communication Technologies in Agricultural Research for Development in Asia-Pacific Region.'
	• APAARI collaborates with ICRISAT in Workshop on 'Research Need Assessment and Prioritization of ARD in South and West Asia'
	• APAARI holds first Expert Consultation on 'Post-Harvest Technologies for Ensuring Food Security and Value Addition for Enhanced Income'
2005	• APCoAB/APAARI organize 'Brainstorming Meeting on Public-Private Partnership in Agricultural Biotechnology' at New Delhi
	• APAARI organizes 'High Level Policy Dialogue on Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges'
	• PGR related issues: IPGRI/APAARI collaboration - South-South East Asia (SSEEA Regional Conservation Strategy developed by IPGRI endorsed by APAARI
2006	• APARIS/APAARI organize Workshop on Advocacy and Inter-regional Cooperation for ICT/ICM in ARD
	• APCoAB with ICRISAT holds workshop on 'Biosafety Regulations for Transgenic Crops and the Need for Harmonizing them in the Asia-Pacific Region'

Box 14: (*Contd.*)

- IPGRI/APAARI roundtable meeting on 'Implementation of ITPGRFA in the Asia-Pacific Region' organized; also APAARI facilitates meeting of seven Asian representatives for drafting of the Standard Material Transfer Agreement (SMTA)
- APAARI-GFAR joint Workshop on 'Regional Synthesis of Research Needs' organized broadening stakeholders' participation in farmers/ farmers organizations, NGOs, the Youth, Private sector, in regional priority setting for ARD
- APAARI-GFAR convene ' Planning Workshop of *ad hoc* Working Group for Asia-Pacific Participation in a Global Partnership Program (GPP) on Linking Farmers to Markets (LFM)'
- APAARI with GFAR-ICAR organizes an Expert Consultation on Agricultural Innovations: Linking Farmers to Markets at New Delhi
- APAARI EC membership to broaden; proposed strengthening of APAARI Governance through inclusion of other stakeholders i.e. GFAR, CGIAR, CSOs in decision making

This publication presents a synthesis of APAARI activities – a retrospective of its achievements over the past one and a half decade tracing its growth and development. As will be evident from the account given, APAARI has made significant contributions. It has played the role of a trust-builder among NARS and enhanced partnership and cooperation for agricultural research for development. Its overall stress on strengthening collaboration through research networks has been commendable. Further, its new initiatives on Asia-Pacific Agricultural Research Information System (APARIS) and Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) have over three years contributed significantly in accelerating the pace of ICT/ICM activities and promoting the application of agricultural biotechnology.

APAARI has kept track of recent developments in agricultural sciences vis-à-vis changed agricultural scenario, and based on NARS' and regional needs, has been regularly organizing meetings, consultations, workshops and dialogues deliberating on specific issues, and finding suitable solutions to emerging problems. It has further strengthened inter-NARS and CG Centers collaboration, and in the new fields, particularly in agricultural biotechnology, developed stronger partnership with the private sector.

APAARI has a very impressive record of bringing out diverse publications, of which, its success stories on different topics for technology dissemination among NARS, need special emphasis, and 25 such successful case studies have been published. Its six-monthly newsletter and proceedings of expert consultations form its on-going activity to enhance NARS knowledge on diverse emerging issues. Other

publications relate to regional directories, special status reports providing regional perspective such as on regional agricultural research systems, on ICT/ICM, and on plant genetic resources. All these have further catalyzed NARS in strengthening their ARD programs.

Overall, APAARI, through its strategies/priorities and action plan, has focused on promoting NARS efficiency through collaboration and networking (facilitating/ promoting crop and regional networks) with diverse stakeholders, bringing polarization on programs/activities, dissemination/promotion of technology transfer, human resource development/capacity building, policy advocacy, public awareness, and enhanced publication and information communication.

Based on its strategic plan, APAARI envisages promoting two more programs, namely, post-harvest technology/ linking farmers to markets (LFM) and natural resource management. It is also concerned about the increasing needs of less developed and weaker NARS for human resource development/capacity building and is working on identifying some developed NARS as 'Centers of Excellence' to impart specific training. Its growing membership and diversification among its partners provides collective knowledge-base and APAARI is quite mindful of utilizing these regional assets to harness agricultural science for a better future, in conformity with the Millennium Development Goals (MDGs), to address poverty reduction and food security, thereby contributing to better livelihoods/welfare of the poor farmers.

Appendix I

APAARI EXECUTIVE COMMITTEES (1991-2006)

Executive Committee for 1991-1992

Chairman	:	Dr. Md. Yusof bin Hashim	Malaysia
Vice-Chairman	:	Dr. Keith W. Steele	New Zealand
Members	:	Prof. W. Lianzheng	China
		Mr. C.R. Mahapatra	India
		Dr. Maripaz I. Perez	Philippines
		Mr. Tubuola Tavita	Western Samoa
Executive Secretary	:	Dr. R.B. Singh	India

Executive Committee for 1993-1994

Chairman	:	Dr. Young Sang Kim	Korea
Vice-Chairman	:	Mr. Balthasar M. Wayi	PNG
Members	:	Prof. Wang Lianzheng	China
		Dr. Zafar Altaf	Pakistan
		Dr. William D. Dar	Philippines
		Mr. Montri Rumakom	Thailand
Executive Secretary	:	Dr. R.S. Paroda	India

Executive Committee for 1995-1996

Chairman	:	Dr. William D. Dar	Philippines
Vice-Chairman	:	Mr. Abbas Keshavarz	Iran
Members	:	Dr. Md. Sharif Bin Ahmad	Malaysia
		Dr. Shiva Bahadur Nepali	Nepal
		Dr. Young Sang Kim	Korea
		Dr. S.T. Semisi	Western Samoa
Executive Secretary	:	Dr. R.S. Paroda	India

Executive Committee for 1997-1998

Chairman	:	Dr. M. Akbar	Pakistan
Vice-Chairman	:	Dr. Nobuyoshi Maeno	Japan
Members	:	Dr. Z. Karim	Bangladesh
		Dr. Ananta Doladom	Thailand
		Mr. J. Kumar	Fiji
		Dr. William D. Dar	Philippines
Executive Secretary	:	Dr. R.S. Paroda	India

Executive Committee for 1999-2000

Chairman	:	Dr. Ian Bevege	Australia
Vice-Chairman	:	Dr. Ananta Dalodom	Thailand
Members	:	Dr. Seong-Hee Lee	Rep. of Korea
		Dr. K.A. Malik	Pakistan
		Dr. R.D. Ghodake	PNG
		Dr. D. Kirtisinghe	Sri Lanka
Executive Secretary	:	Dr. R. S. Paroda	India

Executive Committee for 2001-2002

Chairman	:	Dr. Dhruv Joshi	Nepal
		Dr. R.P. Sapkota	Nepal
Vice-Chairman	:	Mr. J. Kumar	Fiji
Members	:	Dr. M. Nurul Alam	Bangladesh
		Dr. Patricio S. Faylon	Philippines
		Dr. S.H. Anang	Malaysia
		Dr. Ian Bevege	Australia
		Dr. Robert Clements	Australia
Executive Secretary	:	Dr. R. S. Paroda	India

Executive Committee for 2003-2004

Chairman	:	Dr. Mutsuo Iwamoto	Japan
		Dr. Shinobu Inanaga	Japan
Vice-Chairman	:	Dr. M. Nurul Alam	Bangladesh
Members	:	Dr. R.P. Sapkota	Nepal
		Mr. S. Charnnarongkul	Thailand
		Dr. T. Mennesson	New Caledonia
		Dr. Nguyen Van Bo	Vietnam
Executive Secretary	:	Dr. R. S. Paroda	India

Executive Committee for 2005-2006

Chairman	:	Dr. H.P.M. Gunasena	Sri Lanka
Vice-Chairman	:	Dr. T. Mennesson	New Caledonia
Members	:	Dr. Shinobu Inanaga	Japan
		Dr. Badaruddin Soomro	Pakistan
		Dr. M.E. Tusneem	Pakistan
		Mr. Nicomedes P. Eleazar	Philippines
		Mr. Luke Ratuvuki	Fiji
Executive Secretary	:	Dr. R. S. Paroda	India

Appendix II

REGIONAL PRIORITIES FOR THE ASIA-PACIFIC REGION

1. Natural Resource Management
   - 1.1 Integrated NRM and Integrated Crop Management (ICM)/IPM
   - 1.2 Policy development and institutional issues related to NRM
   - 1.3 Watershed management
   - 1.4 Land management and soil fertility
   - 1.5 Rehabilitation of degraded and marginal lands
2. Genetic Resources Enhancement and Agrobiodiversity Conservation
   - 2.1 PGR conservation and improvement
   - 2.2 Livestock selection and improvement (includes fisheries)
   - 2.3 Microbial functional agrobiodiversity
   - 2.4 Biosafety issues/policy/GMOs/IPRs
3. Commodity Chain Development (Linking Farmers to Markets)
   - 3.1 Commercialization, marketing and trade
   - 3.2 Policy–International agreements
   - 3.3 Input/supply and demand analysis (industry and macro level)
   - 3.4 Production and marketing economic analysis (firm/farm and micro level)
   - 3.5 Value adding
   - 3.6 Competitiveness
   - 3.7 Product/quality improvement and standards
   - 3.8 Quarantine and bio-security
4. Meeting the Protein Demand of a Growing Population (Animal)
   - 4.1 Feed resources: fish, poultry, ruminants and non-ruminants (forage, pasture, fodder, grain, constituted feedstocks and crop residues)
   - 4.2 Disease management (poultry, ruminants, non-ruminants, aquaculture)
   - 4.3 Production systems (crop/livestock, aquaculture, mariculture)
   - 4.4 Waste management by-product utilization
5. Meeting the Protein Demand of a Growing Population (Plants)
   - 5.1 Grain legume productivity improvement
   - 5.2 Legumes in farming systems

5.3 Quality and nutrition improvement (human)

5.4 Food safety: Aflatoxins and anti-nutrition factors

6. Tree and Forest Management for Landholders

6.1 Natural forest management

- Harvesting regime and regeneration
- Cutting cycle analysis

6.2 Forest plantation, productivity and health

6.3 Agro-forestry in production systems

7. Cross-cutting Issue: Information Management for Agricultural Development

7.1 Packaging, access and use: Research, methodologies and modalities

8. Cross-cutting Issue: Capacity Building

8.1 Human resources development

8.2 Institutional development

- Research management, stakeholder management
- Technology transfer facilitation

8.3 Research policy development

- Food insecurity and poverty mapping

Appendix III

APAARI PUBLICATIONS

Newsletter

1992-2006 15 Vols. /29 nos; 2 issues each year

Success Stories

1994/1 Baby Corn Production in Thailand by Dr. Chamnan Chutkaew and Dr. R.S. Paroda

1994/2 Tilapia Farming in the Philippines by Dr. Rafael D. Guerrero III

1994/3 Hybrid Rice in China by Mr. Lou Xizhi and Dr. C.X. Mao

1994/4 Dairying in India by Dr. R.P. Aneja

1995/1 Hybrid Cotton in India by Dr. A.K. Basu and Dr. R. S. Paroda

1995/2 Palm Oil Industry in Malaysia by Dr. Y.B. Basiron

1996/1 Transformation in Korean Farming by Dr. Chae Yun Cho

1996/2 Cotton Production in Pakistan by Dr. Badaruddin Soomro and Dr. Parvez Khaliq

1997/1 Orchids in Thailand by Dr. Kanchit Thammasiri

1997/2 Wheat Production in Iran by Dr. Abbas Keshavarz and Dr. M.J. Mirhadi

1997/3 Agro-Tourism in Australia by Dr. Tom Connors

1998/1 Direct Seeded Rice in Malaysia by Dr. Cheong Ah Wah

1998/2 Groundnut in China by Dr. Duan Shufen, Dr. Hu Wenguang and Dr. Sui Qingwei

1999/1 Oilseeds in India by Dr. Mangala Rai

1992/1 Integrated Pest Management in Rice in Indonesia by Dr. Soejitno

2000/1 Bivalve Mariculture in India by Dr. V.N. Pillai *et al.*

2001/1 Farming of Carrageenophytes in the Philippines by Dr. Rafael D. Guerrero III

2002/1 Resource Conserving Technologies: Transforming the Rice-Wheat Systems of the Indo-Gangetic Plains by Raj K. Gupta *et al.*

2003/1 Success Story on Control of Newcastle Disease in Village Chickens by Dr. Robyn Elders

2004/1 A Success Story on Lentil Improvement in Bangladesh by Dr. Ashutosh Sarker *et al.*

2004/2 A Success Story on Sustaining Green Revolution in India by Dr. S. Nagarajan

2004/3 A Success Story on Biological Pest Control in India by Dr. S.P. Singh

2005/1 A Success Story on Trout Farming in Nepal by Dr. A.K. Rai.

2005 Commercialization of Bt Corn in the Philippines: A Status Report by Dr. R.V. Ebora *et al.*

2006 Bt Cotton in India: A Status Report

Reports/Proceedings of Expert Consultations, Meetings

1991 Report of the First General Assembly of APAARI, Bangkok, 11-14 December 1990

1992 Report of the Second General Assembly of APAARI, Kuala Lumpur, 17 December 1992

1995 Report of the Third General Assembly of APAARI and Expert Consultation of NARS Vision towards Future Challenges and Opportunities for Sustained and Enhanced Productivity and Food Security in the Asia-Pacific Region, PCARRD, Los Baños, Philippines, 22-25 November 1994

1996 Consultation on NARS-CGIAR Partnership (co-sponsored by ICAR, FAO, IFAD and ISNAR), 1-2 February 1996, New Delhi

1996 Report on the Expert Consultation on Research Priority Setting by NARS in the Asia-Pacific Region and the 4th General Assembly of APAARI, 25-26 November 1996, New Delhi

1997 Agricultural Research Priorities in the Asia-Pacific Region – An APAARI Overview; 13 October 1997

1998 Fourth Executive Committee Meeting of APAARI and Expert Consultation on Management and Strengthening of Regional Research Networks in the Asia-Pacific Region, 19-21 October 1997, Tehran, Iran

1999 Fifth General Assembly of APAARI and the Expert Consultation on Research Management Mechanisms of NARS, 13-15 October 1998, Suwon, Republic of Korea

2000 Expert Consultation to develop APAARI Vision 2025 and Fifth Executive Committee meeting of APAARI, 29 November – 1 December 1999, FAO-RAP, Bangkok, Thailand

2001 Expert Consultation on the Development of an Asia-Pacific Agricultural Research Information System, 6-7 November 2000, Chiang Rai, Thailand

2001 Sixth General Assembly of APAARI and the Expert Consultation on Strategies for Implementing APAARI Vision 2025; Agricultural Research for Development in the Asia-Pacific Region, 8-10 November 2000, Chiang Rai, Thailand

2001 Regional Priority Setting for Agricultural Research and Development, 12-14 November 2001, Bangkok, Thailand.

2002 Agricultural Research Priorities in the Asia-Pacific Region – A Synthesis

2002 Status of Biotechnology in Agriculture in Asia and the Pacific, 21-23 March 2002

2002 ICT Consultation on Development of Second Phase of APARIS, 24-25 October 2002

2002 Strengthening Research Partnerships through Networks and Consortia, 2-4 December 2002

2003 Establishment of Asia-Pacific Consortium on Agricultural Biotechnology

2003 Strengthening Regional Agricultural Information System and Regional Research Networks, 2-4 December 2002

2004 Post-harvest Technologies for Ensuring Food Security and Value Addition for Enhanced Incomes, 1-2 December 2004, Bangkok, Thailand.

2004 Strengthening Regional Agricultural Information Systems: Role of ICT in ARD, 1-4 December 2003, Bangkok, Thailand.

2004 Information and Communication Technologies in Agricultural Research for Development in the Asia-Pacific Region: A Status Report

2005 Brain Storming Session on Public-Private Partnership in Agricultural Biotechnology: Highlights and Recommendations, 14 March 2005, New Delhi, India

2005 High Level Policy Dialogues on Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges, 7-9 November 2005, Bangkok, Thailand

Directories of Agricultural Research Institutions

1995 Directory of Agricultural Research Institutions in the Asia-Pacific Region: South Asia

1997 Directory of Agricultural Research Institutions in the Asia-Pacific Region: South-East Asia

Agricultural Research Systems – Case Studies

1995 Agricultural Research Systems in South Asia – Organization and Management by Dr. H.K. Jain

1995 Support for Agricultural Research Systems in South-East Asia – Impacts on Growth and Development by Dr. William D. Dar

Regional Synthesis on Agricultural R&D/Management

1999 National Agricultural Research Systems in the Asia-Pacific Region – A Perspective.

2000 Status of Plant Genetic Resources Conservation and Utilization in Asia-Pacific Region: Regional Synthesis Report, Dr. K.P.S. Chandel and Dr. R.S. Paroda

2001 APAARI – A Decade of Progress

Medium-Term and Long-Term Plans

1995 APAARI Perspective Plan

2000 APAARI Vision 2025

Publications with Partners/Associate Members

1998 Proceedings of the Asia-Pacific Regional Consultation on Plant Genetic Resources, 27-29 November 1996, IARI, New Delhi (eds. R.K. Arora and K.W. Riley), IPGRI Office for South Asia, New Delhi.

2005 Research Need Assessment and Agricultural Research Priorities for South and West Asia: Proceedings of the Workshop, 7-8 October 2004. ICRISAT, Patancheru (eds., M.C.S. Bantilan, Mruthyunjaya, C.L.L. Gowda and G.V. Anupama), International Crops Research Institute for the Semi-Arid Tropics, Patancheru.

Appendix IV

INSTITUTES' PROFILES/INFORMATION PUBLISHED IN APAARI NEWSLETTERS: 1992-2006

APAARI Newsletter	Institute/Center–Profile/information	Year of establishment
1992 Vol. 1 (1)	• Indian Agricultural Research Institute (IARI) New Delhi (earlier Imperial Agricultural Research Institute)	1936
1992 Vol. 1 (2)	• Department of Agriculture (DoA), Bangkok, Thailand	1972
1993 Vol. 2 (1)	• Malaysian Agricultural Research Institute (MARDI), Kuala Lumpur, Malaysia	1969
1993 Vol. 2 (2)	• The Rural Development Administration (RDA), Suwon, Republic of Korea (earlier office of RDA, 1962)	1985
1994 Vol. 3 (1)	• The Philippine Council For Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Los Baños, Philippines (earlier Philippine Council for Agricultural Research)	1972
1994 Vol. 3 (2)	• Pakistan Agricultural Research Council (PARC), Islamabad, Pakistan	1981
1995 Vol. 4 (2)	• Japan International Research Center for Agricultural Sciences (JIRCAS), earlier Tropical Agriculture Research Center	1993
1996 Vol. 5 (1)	• National Bureau of Plant Genetic Resources (NBPGR), New Delhi, India (earlier Plant Introduction Division, Indian Agricultural Research Institute, New Delhi, 1961)	1976
1996 Vol. 5 (2)	• Australian Center for International Agricultural Research (ACIAR), Canberra, Australia	1982
1997 Vol. 6 (1)	• Nepal Agricultural Research Council (NARC), Kathmandu, Nepal	1991
1997 Vol. 6 (2)	• Bangladesh Agricultural Research Council (BARC), Dhaka, Bangladesh	1973
	• CGIAR at a glance	1971

APAARI Newsletter		Institute/Center–Profile/Information	Year of establishment
1998	Vol. 7 (1)	• National Agricultural Research Institute (NARI), Lae, Papua New Guinea	1996/97
1998	Vol. 7 (2)	• Asian Institute of Technology (AIT), Bangkok, Thailand	1959
		• Global Forum on Agricultural Research (GFAR)	1996
1999	Vol. 8 (1)	• University of the South Pacific (USP), Apia, Western Samoa	1968
		• Agricultural Research Planning for the 3rd Socio-economic Plan of Iran 2002-2004 - Some Recent Activities at AREO	
1999	Vol. 8 (2)	• The M.S. Swaminathan Research Foundation (MSSRF), Chennai, Tamil Nadu, India	1988
2000	Vol. 9 (1)	• Achievements in Agricultural Research Technology and Development: Council of Agriculture (CoA), Chinese Taipei	
		• ACIAR - An Institutional Update	
		• CARP promotes Agricultural Research and Training activities in Sri Lanka	
2000	Vol. 9 (2)	• CIRAD activities in Asia and the Pacific	1984
		• Recent activities at AREO, Iran	
		• Recent activities at CARP, Sri Lanka	
		• ICUC (International Center for Underutilized Crops) activities in Asia	
		• Recent activities at JIRCAS	
2001	Vol. 10 (1)	• Recent activities at CARP, Sri Lanka	
		• Recent agricultural research and development activities at NARC, Nepal	
		• The International Center for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal	1981
2001	Vol. 10 (2)	• Japan International Research Center for Agricultural Sciences (JIRCAS): Structural reorganization	
		• Seed and Plant Improvement Institute, AREO, Tehran, Iran	
		• Strengthening Agricultural Research and Development in the Pacific: NARI's activities	
2002	Vol. 11 (1)	• ICBA: An International Research Center devoted to growing plants with salty water on marginal lands	1999

APAARI Newsletter		Institute/Center-Profile/Information	Year of establishment
		• Recent activities in agricultural research and development by RDA, Korea	
2002	Vol. 11 (2)	• Indonesian Agency for Agricultural Research and Development (IAARD), Jakarta, Indonesia	
		• JIRCAS-Recent activities	
		• PCARRD-Research activities	
2003	Vol. 12 (1)	• Institut Agronomique nao Caladonien – IAC (New Caledonia): A profile	
		• Asia-Pacific Association of Forestry Research Institutions (APAFRI): Recent activities	
2005	Vol. 14 (1)	• ICARDA–An International Center for Agricultural Research in the Dry Areas, Aleppo, Syria	1977
2005	Vol. 14 (2)	• Papua New Guinea, University of Technology, Lae, Papua New Guinea (earlier PNG Institute of Higher Education, 1965)	1973
2006	Vol. 15 (1)	• Indian Council of Agricultural Research (ICAR), New Delhi, India (earlier Imperial Council of Agricultural Research)	1929

Appendix V

INFORMATION ON RESEARCH NETWORKS AND CONSORTIA PUBLISHED IN APAARI NEWSLETTERS: 1992-2006

APAARI Newsletter	Information on Agricultural Research Networks
1992 Vol. 1 (2)	• Asia-Pacific Agricultural Networks—Asian Network on Sericulture; on Oilseed Crops
1993 Vol. 2 (1)	• Asia-Pacific Agricultural Networks—Asian Network on Rainfed Agriculture
1993 Vol. 2 (2)	• Asia-Pacific Agricultural Networks—Asian Network on Medicinal and Aromatic Plants (ANMAP)
1994 Vol. 3 (1)	• International Network on Genetic Evaluation of Rice (INGER) • Asian Soyabean Networks
1994 Vol. 3 (2)	• Networks on Vegetable Crops
1995 Vol. 4 (2)	• First TAMNET Planning Meeting
1996 Vol. 5 (1)	• IRRI-APAARI Partnership Establishes CORRA (Council on Partnerships in Rice Research in Asia) • South Asian Vegetable Research Network Joint Planning Meeting
1996 Vol. 5 (2)	• Cereals and Legumes Asia Network (CLAN) • Asia-Pacific Network on Banana and Plantain Regional Advisory Committee Meeting
1997 Vol. 6 (1)	• Rice-Wheat Consortium for the Indo-Gangetic Plains • Third Steering Committee Meeting of UTFANET (Underutilized Tropical Fruits Asia Network) • Second Meeting of Tropical Asian Maize Network (TAMNET) • AVRDC launches Phase II of SAVERNET • Global Program for Musa Improvement (Promusa) launched
1997 Vol. 6 (2)	• Expert Consultation on Regional Research Networks in Asia-Pacific Region

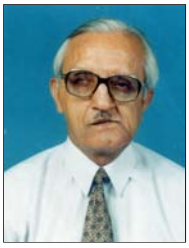
APAARI Newsletter	Information on Agricultural Research Networks
	• 2nd ASPRAD (Network of Asian Sweet Potato and Potato R&D program) coordinating committee meeting
	• Promusa-A global initiative for Musa improvement
	• Network of Aquaculture Centers in Asia-Pacific (NACA)
1998 Vol. 7 (1)	• Network of Asian Sweet potato and Potato R&D Program (ASPRAD)
	• UTFANET 4th Steering Committee meeting
	• 7th Asian Regional Maize Workshop
1998 Vol. 7 (2)	• South Asia Network on Plant Genetic Resources (SANPGR)
	• Aquaculture Resources Research finds place in APAARI
	• Underutilized Tropical Fruits Asia Network (UTFANET)
	• INIBAP/ASPNET activities
	• Asian Network on Sweet Potato Genetic Resources (ANSWER)
1999 Vol. 8 (1)	• Increased Profile for Aquaculture Genetic Resources Research in GoFAR/APAARI member countries
	• Council for Partnerships in Rice Research in Asia (CORRA)
	• CIMMYT-Asian Regional Maize Program
1999 Vol. 8 (2)	• UTFANET Fifth Steering Committee meeting
2000 Vol. 9 (1)	• Taro Genetic resources conservation and utilization: Activities of TaroGen Project
2000 Vol. 9 (2)	• APAARI holds ICT Expert Consultation
	• CORRA Fourth annual meeting
2001 Vol. 10 (1)	• APARIS–A Gateway to information networking in the Asia-Pacific
2001 Vol. 10 (2)	• ICLARM-Expert Consultation on Fisheries and Aquaculture Research Priorities Setting within the Asia-Pacific region:Second GoFAR meeting
2002 Vol. 11 (2)	• Expert Consultation on Strengthening Research Partnerships through Networks and Consortia
	• ICT Expert Consultation on Development of Second Phase of APAARI
	• CORRA Fifth annual meeting
	• Third meeting of GoFAR

APAARI Newsletter	Information on Agricultural Research Networks
2003 Vol. 12 (1)	• FAO/APAARI meeting on Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) • Support Group meeting on APARIS • AARINENA-ICT Expert Consultation Workshop
2003 Vol. 12 (2)	• Establishment of Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) • Report on progress of Regional Research Networks • Expert Consultation on strengthening APARIS
2004 Vol. 13 (2)	• APARIS Third Steering Committee meeting • APCoAB Second Steering Committee meeting • Second INCANA meeting
2005 Vol. 14 (1)	• APCoAB Third Steering Committee meeting
2005 Vol. 14 (2)	• APCoAB Fourth Steering Committee meeting • Agricultural Research in Asia and the Pacific • Recent investment trends in 9 countries: ASTI • INCANA travelling workshop on hybrid and Bt cotton in India • 8th CLAN Steering Committee meeting
2006 Vol. 15 (1)	• APCoAB Fifth Steering Committee Meeting • APCoAB progress to date • Update on APARIS

ABOUT THE AUTHORS

Dr. R. S. Paroda is an accomplished plant breeder, and an able research administrator. He was Director General, Indian Council of Agricultural Research (ICAR) from 1998-2001 and was instrumental in strengthening the national agricultural research systems in India, and has also the unique distinction of being the main architect of the world's one of the largest and most modern national genebanks. He was instrumental in establishing the Asia Pacific Association of Agricultural Research Institutions (APAARI), and has provided thrust to its program since 1993 as its Executive Secretary. As Head, CGAIR Program Facilitation Unit for Central Asia and the Caucasus since 2001, he has provided immmese thrust to strengthen ARD activities in the CAC region. He served as Chairman of the Global Forum on Agricultural Research from 1998-2001. He is a Fellow of almost all the prestigious science Academies in India and a foreign Fellow of the Russian Academy of Agricultural Sciences and the Third World Academy of Sciences (TWAS), Italy. He was the President of the National Academy of Agricultural Sciences (India) during 1996-2001. He was elected as General President of the Indian Science Congress Association in 2000-2001.

In recognition of his meritorious contribution to agricultural research, the President of India conferred on him PADMA BHUSHAN in 1998. Other prestigious awards conferred on him include Rafi Ahmed Kidwai Memorial Prize (1982-83), Federation of Indian Chamber of Commerce and Industry (FICCI) Award (1988), Om Prakash Bhasin Award (1992) and Special Asia Pacific Seed Association Award (1995). In recent past, he received the prestigious Dr. B.P Pal Gold Medal from National Academy of Agricultural Sciences (NAAS) and Dr. Borlang Award from the President of India at the Indian Science Congress in January 2006.



Dr. R. K. Arora has wide experience of the Indian NARS as Head, Division of Plant Exploration, and as Officiating Director of NBPGR. Since 1989, he has been working with IPGRI, earlier as its Coordinator for South Asia Office and from 1998 as Honorary Research Fellow. He has also been actively associated with APAARI for over 8 years as a consultant/resource scientist particularly assisting in its publications, and providing advisory role with his vast experience of working with NARS, regional and international organizations. He is a Fellow of the National Academy of Sciences, and of the National Academy of Agricultural Sciences, India; and recipient of a few prestigious national awards; Harsberger Medal as distinguished ethnobotanist and Harbhajan Singh Memorial Award for his life-time contribution to collection, conservation and use of plant genetic resources.