



APAARI

Newsletter

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Editorial

The Asia-Pacific region accounts for 57% of the world's total and 73% of the agricultural population, with only 1/3rd of the global agricultural land. About 80% of the world's small and marginal farmers live in this region. More than 650 million people, half of the world's poor (income <US\$ 1/day), live here. The rural areas have much higher concentration of hunger and poverty. At the same time, the growth rate of food grain production has registered a steady decline. Thus, Asia and the Pacific region currently faces challenge of liberating itself from the clutches of hunger and poverty, which is the major objective of the Millennium Development Goals (MDGs).

One of the main causes of slow growth of agriculture is the slow development and infusion of new technologies. Technology and innovation systems in agriculture are changing rapidly and they need to be dynamically geared to meet the challenges of increasing resource scarcity and the structural transformation of the economic and social role of agriculture.

It is well recognized that with 'business as usual' approach, agriculture will not be able to play an effective role in the socio-economic development. Any further growth in agriculture can be achieved only with the enhanced application of new science (biotechnology, information and communication technology, management science). The technology generation, verification and dissemination capacity of several NARS and ARD stakeholders has to be enhanced, for which necessary means and mechanisms need to be put in place.

It is, therefore, evident that a fresh examination is called for to reorient the role and necessary linkages for agricultural research to deliver development objectives to ensure large scale impact while addressing both hunger and poverty.

APAARI, a regional forum, is actively associated with the Global Forum on Agricultural Research (GFAR), in an on-going process of global consultation to reprioritize the agendas for agricultural research for development through a consultation mechanism involving wide range of stakeholders. ADB has provided needed funding support for this consultation process. The initiative is likely to help in harmonizing the development efforts of all stakeholders by having main focus on specific needs of resource poor small farmers.

The consultation process was undertaken in two steps. First, an e-consultation (4-24 September, 2009) that involved about a thousand individuals associated with ARD. The second step was a multi-stakeholder Face to Face meeting held on 30-31 October, 2009 at Bangkok. An important outcome of the consultation was a joint "Bangkok Declaration" that reflects a collective thinking of those stakeholders from the region who attended. The recommendations of this consultation will feed into the Global Conference on Agricultural Research for Development (GCARD), scheduled to be held in Montpellier, France from 28-31 March, 2010.

APAARI feels privileged to be associated with these important regional initiatives and places on record its appreciation to ADB and GFAR and also APAARI members and stakeholders for their support and cooperation for the success of above mentioned consultative process leading to valuable insight for reorienting agricultural and natural resource research (ANRR) agenda for the region. In this context, immediate attention of all concerned is called for to make a real difference in addressing MDGs.

Editors

APAARI Executive Committee Meeting

The second meeting of the APAARI Executive Committee for 2009-2010 was held on 26 October, 2009 at the Taiwan Agricultural Research Institute (TARI), Taichung.

Dr. Abd Shukor bin Abd Rahman, Chairman and Dr. Raj Paroda, Executive Secretary, APAARI, welcomed members of the Executive Committee and other delegates who participated as observers. They expressed gratitude to the Council of Agriculture (COA), Taipei for cosponsoring and hosting the two important meetings of APAARI.

The Chairman appreciated the progress made by APAARI as per the workplan. The Committee approved the minutes of the meeting held on 29 January, 2009 in Bangkok.

The salient activities of APAARI during 2009 were presented by Dr. Raj Paroda. These were :

1. Recruitment of Dr. S. Attaluri as Coordinator of Asia-Pacific Agricultural Research Information Systems (APARIS) at the Secretariat in Bangkok effective 1 July, 2009.
2. APAARI collaborated with ADB to develop a strategy for research leading to development of agriculture sector in the region. An e-consultation had successfully been organized and the Face to Face meeting was planned on 30-31 October, 2009 in Bangkok.
- (a) APAARI and Secretariat of Pacific Community (SPC) had organized a meeting on "Crops for the Future" in Fiji in collaboration with Bioversity International and ICUC.
- (b) APAARI-COA, Chinese Taipei are jointly organizing an "Expert Consultation on Biopesticides and Biofertilizers",
- (c) A "Training on *In Vitro* and Cryopreservation Techniques for Conservation of Plant Genetic Resources" is being organized by APAARI-Bioversity International in participation with NBPGR, ICAR.
- (d) Meeting of "South Asian Network on Plant Genetic Resources (SANPGR)" will be held in New Delhi.
- (e) The following eight new members in different categories have joined APAARI during 2009:
 - (i) International Centre for Tropical Agriculture (CIAT),
 - (ii) Sugar Research Institute of Fiji (SRIF),
 - (iii) Agriculture Research Institute of Afghanistan (ARIA),
 - (iv) Birsa Agricultural University (BAU),
 - (v) Indian Agricultural Universities Association (IAUA),
 - (vi) Allahabad Agricultural Institute— Deemed University (AAI-DU),
 - (vii) Secretariat of the Pacific Community (SPC), and



Members of the Second APAARI Executive Committee

- (viii) Central Asia and Caucasus Association of Agricultural Research Institutions (CACAARI).
- (f) The members were informed that effective 2009, all CGIAR Institutes, MARDI and PNG have increased their membership of APAARI.
- (g) The audited statement of accounts for the period of January to September, 2009, together with updated statement of Assets and Liabilities along with the Letter of Certification from the Auditor and the Bank, were presented and unanimously approved.
- (h) The members were informed that APAARI Fixed Deposits have now reached the target of US\$ 1.0 million. Members also discussed the possible ways for secured investment of this FD amount, for income generation. The idea received a favourable response and it was suggested to contact IRRI Director, Finance for advice.
- (i) The budget for 2010 was presented and duly approved.
- (j) Rural Development Administration (RDA), Republic of Korea has kindly agreed to host an Expert Consultation and the 11th GAM of APAARI in October, 2010. The theme of the Consultation would be on Sustainable Agriculture and Biodiversity. Dr. Woon-Goo Ha, Deputy Director, International Technical Cooperation Center (ITCC) briefed regarding meeting preparations for hosting the 11th GAM of APAARI in Suwon, Republic of Korea.
- (k) Dr. Robert Zeigler, Director General, IRRI presented the concept model of Global Rice Science Partnership (GRiSP) on increasing and sustaining rice production to the benefit of the poor. It will have a 10 year strategic plan for 2011-2020. Tentatively, it is proposed to organize the regional GRiSP Consultation for Asia in mid-2010 and APAARI will be involved for its endorsement.

In concluding remarks, both the Chairman and the Executive Secretary extended their thanks to the officials of TARI, COA, and APAARI, who were involved in organizing the meetings.



Bangkok Declaration

on

Reorienting Agricultural Research for Development in Asia-Pacific Region

PREAMBLE

Agriculture remains important for economic growth, livelihood and sustenance for majority of the people in the Asia-Pacific region forming about 57% and 73% of the world's total and agricultural population, respectively. The land availability per person is only about one fifth of that in the rest of the world. Research in the agricultural sector led to remarkable achievements in the past to attain food security and reduction in poverty. Agricultural population is dominated by small farm holders, pastoralists, tribals, fishermen and agricultural

investments in agricultural research had high rates of return both in terms of growth and poverty reduction in the region.

A regional consultation process, jointly initiated by the Asia-Pacific Association of Agricultural Research Institutions (APAARI) and Asian Development Bank (ADB), in collaboration with the Global Forum on Agricultural Research (GFAR), to identify priority directions for research in agriculture and natural resource for development in Asia-Pacific has just been completed. The bottom up process involved e-consultations, studies of priority research needs in South Asia, Southeast Asia,



Participants of the APAARI-ADB-GFAR Face to Face Meeting

labourers. However, about 63% (640 million) of the world's hungry and malnourished, 50% (over 660 million) of the world's extreme poor (living on less than US\$ 1/day), and 70% of the world's undernourished children and women live in the Asia-Pacific region. Over the last two years, the number of hungry in the region has increased by about 11%. The Millennium Development Goals, especially to reduce hunger and poverty to half by 2015, are no longer closer to be achieved despite all commitments and on-going efforts.

The region is facing stagnation or slow down of productivity growth rates, soaring food prices, increasing energy costs, diversion of area for biofuel production, consequences of the climate change and economic shocks. The problems of the numerous and geographically dispersed small farm holders and other resource poor communities, who form the bulk of agricultural population, persist: low yields, low returns from farming, and inadequate access to resources and markets. Natural resources, particularly land and water, are becoming scarcer and degraded. Addressing these complex challenges, with opportunities to harness many innovations, now require out of box solutions (technology, institutions, policies, and higher investment). Previous analyses have unequivocally shown that

China and the Pacific countries, and finally a Face to Face meeting of various stakeholders. The Consultation on Agricultural Research for Development (AR4D) in Asia-Pacific was held in Bangkok from October 30 to 31, 2009. The outcome of this consultation would provide an input to the Global Conference on Agricultural Research for Development (GCARD) to be held in March, 2010 in Montpellier, France. It will also contribute to the change management initiative of the Consultative Group on International Agricultural Research (CGIAR). The process as a whole will provide a clear focus on the development objectives that will contribute to the reform and renewal of agricultural research as well as innovation systems in the region.

The discussions held in the Bangkok meeting involved 75 stakeholders from 17 countries representing APAARI member National Agricultural Research Systems (NARS), CGIAR, GFAR, Advanced Research Institutions (ARIs), Universities, Non-Governmental Organizations (NGOs), farmers' organizations, the private sector and the donor organizations. They deliberated on refocusing agricultural research for a development agenda for Asia and the Pacific. The outcome of deliberations led to the adoption of "Bangkok Declaration", which recognizes the

urgent need for increasing investments in research, innovative thinking and action for reorientation of our research agenda for achieving sustainable agriculture in the region.

DECLARATION

1. We, the stakeholders of agricultural research for development (AR4D), recognize that the Asia-Pacific region is home to almost half of the global population and has high rates of population growth, poverty, hunger and malnutrition. We also believe that agriculture will continue to play a critical role in terms of employment and livelihood security of small farm holders, pastoralists, tribals, fishermen, landless labourers and all those involved in agricultural value chain. The region is not only rich in diverse natural and genetic resources but also important in being a major supplier of food and agriculture commodities. A profitable, dynamic, sustainable science based agriculture in the region can, therefore, alleviate hunger and poverty and contribute significantly to food and nutrition security.
2. While we are determined to free the region from the twin scourges of hunger and poverty, we do realize that along with application of science in agriculture, enabling policies and increased investments in infrastructure will foster new partnerships through innovative institutional arrangements leading to large scale impacts.
3. It is evident that invariably governance systems are weak, political commitment is inadequate and a coordinated approach to development addressing the needs of the poor and vulnerable is lacking. In this regard, NARS will need to effectively establish dialogues as well as linkages, and work closely with all other development partners and policy makers to ensure synergy and the desired impact. NARS would, therefore, benefit much from the improved research planning and management, while ensuring the much needed partnership with the small farm holders, private sector and the related civil society organizations (CSOs). In this context, the governments must embrace AR4D as an integral component of national agricultural policy.
4. In this Expert Consultation, priority AR4D needs have been identified which require increased resources urgently. New investments are essential for integrated natural resource management with focus on land and water issues; socio-economic and policy research to empower small farm holders to concentrate on productivity enhancement of major food crops as well as lesser-known crops of high economic potential; post-harvest management and value addition; energy security (without compromise on food security); and capacity building, especially skills development including that for research planning, prioritization, impact assessment and poverty mapping. Addressing these needs will ensure resilience to cope with economic shocks and natural disasters, including climate change. The needs and prospects for Atoll Islands in the Pacific are unique and hence be addressed accordingly.
5. We also recognize that new approaches are necessary to achieve impact in the priority research areas. These approaches will effectively address the needs of small farm holders, pastoralists, tribals, fishermen and agricultural labourers, and particularly benefit the more vulnerable groups. The new approaches include: farming systems research in the ecosystem framework through need based diversification (livestock, horticulture, fisheries, post-harvest processing and value addition); increased participation involving farmers, NGOs, women and youth; value chain; blending traditional knowledge with modern technologies; community based resource management; extensive use of information and communication technology (ICT) and the establishment of rural knowledge and communication centres for generation, assessment and transfer of new technologies/innovations. Strong public-private-civil society partnerships for providing and delivering Transfer of Technology (ToT) services and for linking farmers/farmer groups to markets are needed much in the present context.
6. Promotion, organization, and strengthening of local, national and regional networks ensuring south-south collaboration is essential to make efficient and effective use of individual country strengths, human capacity, donor support and other available resources.
7. We strongly recommend that in order to meet the challenge of hunger and poverty in the region, the current investments in agricultural research in the Asia and Pacific region need to be atleast **doubled** from its current level of about US\$ 10 billion. To attract the required funding from international development community/organizations and the private sector, a firm commitment from every government is needed to raise the level of agricultural GDP from around 0.3% to at least 1%. There is an urgency to ensure both long-term (core) funding for continuity, and short-term quick funding by the donor community to meet the new challenges. Business as usual with the current level of investments without clear expected benefits for the resource poor should no longer be acceptable.
8. For an effective and efficient use of research funds, there is a clear need for reorientation of agricultural research for a development agenda by the NARS that is demand driven, enhances food and nutrition security, improves livelihoods and takes into account the expected direct benefits to the small farm holders and the poor consumers, and that addresses the key emerging challenges. In order to ensure this, active participation and involvement of resource poor farmers, NGOs and the private sector is called for.
9. It is our expectation that the renewed priorities for agricultural research with focus on small farm holders, the poor producers and consumers, with new mechanisms and partnerships elaborated in this declaration, will not only ensure inclusive development at the national and regional level for continuous supply of food and other agricultural commodities, but will also hasten the pace towards achieving the Millennium Development Goals in the Asia-Pacific region.
10. We are confident that Asia-Pacific agriculture will liberate the region from hunger, malnutrition and poverty and bridge the widening income divide between farmers and non-farmers. It must continue to supply its region and the world with food and agricultural commodities. Given the declining land, water and agro-biodiversity resources and the intensifying environmental footprint of agriculture, the task is difficult, but certainly not insurmountable.



Expert Consultation on Biopesticides and Biofertilizers

The expert consultation was organized at Taiwan Agricultural Research Institute, Taichung from 27 to 29 October, 2009 under the APAARI-COA collaborative program on agricultural biotechnology. Seventy-two participants from 23 countries representing NARS, CG centres, other academic institutions, CSOs, private sector and farmer organizations attended the three days program comprising two days of deliberations and one day field trip. The event was inaugurated by Dr. Su-San Chang, Director General, International Cooperation, COA on behalf of the Minister of Agriculture, which was followed by six technical sessions namely: Presentation of Lead Papers; Presentation of Country Status Reports; Reports of Regional/International Institutions and other Stakeholders; Biopesticide and Biofertilizer Innovations and Commercialization; Break-out Group Discussions (Issues for Research and Development; Commercialization; Policy Regulation and Regional Cooperation); and Plenary Session.

There was consensus that biopesticides and biofertilizers have an important place in repertoire of inputs aimed at developing sustainable agricultural production systems. Following recommendations were made to promote the development and use of these bioagents in agriculture:

1. Intensify efforts to develop more efficient products and technologies, and enhanced capability and capacity for the production, availability, access, refinement, promotion, adoption and assessment of environment friendly bio-inputs through participatory mode involving public and private sectors, self help groups, farmers and other stakeholders.
2. Increase emphasis on formulation research and development, particularly the active material/organism-formulant/auxiliary/other ingredient(s), to yield standard and stable, quality products. Improvement of shelf and field lives be specifically focused.
3. Promote indexing, cataloguing, documentation of products, technologies, indigenous folklore knowledge and other



Participants of the Expert Consultation

information, and make the data banks accessible for reference and use, particularly for improvement of plant and microbial species and strains for the desired traits.

4. Enhance government support and incentives in terms of policy, procedures, intellectual property (development, protection and sharing), fiscal and non-fiscal benefits, risk insurance, research, development, training, knowledge based extension and other efforts to promote the bio-intensive, environment benign, pest and nutrient management systems in the respective countries of the region.
5. Develop and implement regulatory and biosafety protocols for the bio-products, including for the genetically modified organisms, improved strains, individual organisms and/or microbial consortia, and others.
6. Establish a Regional Network on Biopesticides and Biofertilizers among APAARI member countries for promoting partnerships, knowledge sharing, capability and capacity building, and other activities to focus on a time bound promotion of these bio-inputs, including their need based integrated use along with the chemical inputs in the region.



ICRISAT Germplasm for Svalbard Global Seed Vault

As part of the agreement between ICRISAT and the Nordic Genetic Resource Center (earlier known as the Nordic Gene Bank or NGB), ICRISAT is committed to transferring duplicate seed samples of the 111,000 in-trust accessions to the Svalbard Global Seed Vault over a five-year period. The first consignment of 20,000 accessions representing the five mandate and two small millet crops were deposited at the Nordic Genetic Resource Center in 2008. Dr. William Dar, Director General represented ICRISAT at the opening ceremony of the seed vault on 26 February, 2008. Similarly, this year the second batch of 23,000 seed samples were dispatched in November and December to the seed vault in Norway.

These samples, received in excellent condition, were shifted to the designated vault chamber. The passport and conservation data were successfully uploaded on the portal www.nordgen.org/ sgsv. The total number of ICRISAT germplasm samples at the seed vault has reached 43,000, representing sorghum (13,000), pearl millet (8,050), chickpea (6,000), pigeonpea (5,000), groundnut (4,550), finger millet (4,400), foxtail millet (1,000), proso millet (600) and little millet (400). ICRISAT acknowledges the support of the Global Crop Diversity Trust (GCDT), Nordic Genetic Resource Center and National Bureau of Plant Genetic Resources (NBPGR), New Delhi in this task.

(Source: ICRISAT News)

XI APCoAB Steering Committee Meeting

The XI Steering Committee Meeting of APCoAB was held on 26 October, 2009 at Taiwan Agricultural Research Institute, Taichung. The meeting was chaired by Dr. Abd Shukor Abd Rahman, Chairman, APAARI and attended by 8 members and special invitees, including Executive Secretary APAARI and Coordinator, APCoAB. In his opening remarks, the Chairman appreciated the achievements of the consortium, especially in the area of human resource development, an opinion endorsed unanimously by all the SC members. The continuing support of ICRISAT, COA and Mahyco in sustaining APCoAB was thankfully acknowledged by the SC. Coordinator, APCoAB presented the progress made during the period under report that comprised: organizational details of Expert Consultation on Biopesticides and Biofertilizers for Sustainable Agriculture being held on 27 to 29 October, 2009; training program on Bioassay of Pesticide Residues; publication on Bt Cotton in India; CD on Agricultural Biotechnology Institutions of Asia-Pacific; and web-based information dissemination. Audited accounts for the year 2009 (till September) and budget for 2010 were also presented and approved. The program for 2010 was approved as under:

- Policy Dialogue/Brainstorming/Public awareness on GM Technology for Increasing Agricultural Productivity in Asia
- Publication on Banana tissue culture in the Philippines
- Publication on Banana tissue culture in India
- Publication on Bt Cotton in China



Members of the XI APCoAB Steering Committee

- Training Course on “*In vitro* and Cryopreservation Techniques for Conservation of Plant Genetic Resources”, to be held at National Bureau of Plant Genetic Resources, New Delhi.
- Training Courses on “Assisted reproductive technologies for livestock genetic improvement” in collaboration with COA and ILRI.
- Training Courses on “Edible Mushroom Production for Asian Farmers and Entrepreneurs” in collaboration with COA.

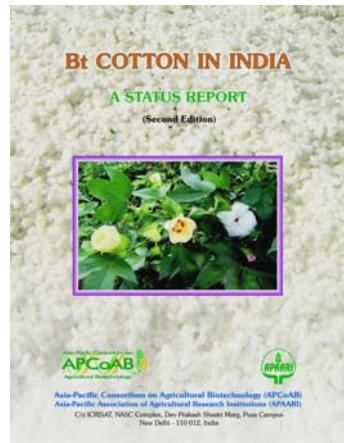
It was also advised to pursue the pending regional project proposal on tissue culture platform with FAO-RAP. The next steering committee meeting was decided to be held in April 2010, back to back with APAARI Executive Committee Meeting.



New Publications of APCoAB

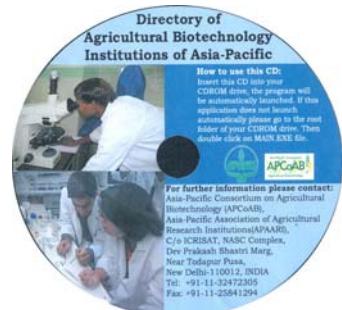
Bt Cotton in India— A Status Report (2nd Edition) 2009

APCoAB has brought out the second edition of its report on Bt cotton in India. It provides up to date information on development, production and economics of Bt Cotton, and highlights contemporary issues related to the technology and the impact of its adoption in India. The report is compiled into seven chapters: I. Introduction, II. Biosafety Regulatory System, III. Development and Commercialization of Bt Cotton, IV. Performance and Impact of Bt Cotton, V. Concerns and the Way Ahead, VI. Epilogue, VII. Bibliography. The publication is available at www.apcoab.org and www.apaari.org for free downloading.



CD on Agricultural Biotechnology Institutions of Asia-Pacific

APCoAB has compiled a database on agricultural biotechnology institutions existing in 36 countries of the Asia-Pacific region. It includes detailed information on institution location, contact details, websites, areas of activity and focus areas of research and development in agricultural biotechnology. Requests for CD may be sent to: Coordinator, Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB), NASC Complex, Dev Prakash Shastri Marg, Pusa, New Delhi 110012, India; Tel: 91-11-32472305; Fax: 91-11-25841294; Email: j.karihaloo@cgiar.org.



VIII APARIS Steering Committee Meeting

The eighth meeting of the APARIS Steering Committee was held on 29 October, 2009 at FAO RAP, Bangkok.

Dr. Raj Paroda, Executive Secretary, APAARI welcomed members of the Steering Committee and special invitees. He appreciated the support provided by Australian Centre on International Agricultural Research (ACIAR) to APAARI and its patronage for the APARIS Program for improving dissemination of knowledge related to AR4D in Asia and the Pacific region. He informed that the vacant position of APARIS Coordinator has since been filled through open competition process in July, 2009.

Dr. Simon Hearn, Chairman, Steering Committee in his opening address flagged the growing concern for food security, improving access to food by the hungry and challenges posed by climate change through on-going initiatives like CGIAR reforms, and mega programs that are crucial for agricultural development in Asia and the Pacific region. He expressed that APAARI has an important role to play to address these challenges in the region. He envisaged that APARIS program has a pivotal role in realizing the mandate of APAARI through sharing of knowledge and networking, capacity building, partnerships etc. among ARD stakeholders in the Asia-Pacific region.

Dr. Ajit Maru, GFAR and Vice-Chairman, Steering Committee emphasized that today's agriculture is knowledge intensive and managing agricultural information and knowledge is key for the success of AR4D. He envisaged that APARIS should play an important role in the region to address these challenges and assured support and guidance from GFAR to APARIS program.

The minutes of the APARIS Steering Committee Meeting held on 20 April, 2008 were approved by the Committee and the action taken report was also presented.

The APARIS Coordinator presented the progress of APARIS activities during the period July-October, 2009 as under:

- APAARI Newsletter (June 2009 issue).
- Redesigning of APAARI Website.
- Publishing of APAARI on CD-2009.
- Facilitation in GCARD e-Consultation process for Asia and the Pacific region.
- APAARI Poster redesigning.

The Chair desired that needs of island countries and sub-regions should be kept in view to address specific challenges and for greater impact of APARIS programs.

Strengthening the initiatives of FAO/CGIAR/GFAR and the CIARD RING in the region through integration of APARIS activities was emphasized. APARIS should consider developing a true electronic platform that links all the agricultural research institutions and resources and lead the ICM initiatives in AR4D in the region.

The APARIS Coordinator proposed the work plan and budget for 2010. The Steering Committee approved the program as indicated in the box.



Members of the Eighth APARIS Steering Committee

Development of Communication Strategy in the Asia-Pacific region was approved. The strategies thus developed should enable NARS, Extension System and NGOs in reaching their respective target groups effectively.

Status Report on ICT/ICM in ARD in the Asia-Pacific, with the involvement of NINPs/NARS, that enable preparation of need-based proposals, investment in ICT/ICM, increase in infrastructure and partnerships to foster application of ICT/ICM for ARD in the region.

Success Stories on ICT/ICM to help in disseminating the innovations efficiently with active involvement of NARS in identifying and preparing the success stories

Capacity Building Programs for National Agricultural Information Systems (NAIS) to be organized with GFAR during July-August 2010 with the support and collaboration of institutions like Asian Institute of Technology– Extension (AIT Extension) and GFAR. The Committee felt that APAARI has to take the leadership in moving forward the ICM/ICT agenda for AR4D in the region through capacity and advocacy programs. It was also suggested to explore possibilities of involving NGOs and private sector in the capacity building efforts.

Renewal of website domain name www.apaari.org, server hosting and website maintenance, which will expire in April 2010 was approved.

It was recommended to drop **Regional Agricultural Expert Locator (REAL) and Regional Agricultural Information Gateway (RAIG) and use of Web 2.0 Technologies** and follow the development of information resources as per the suggestions with a suitable name for the activity.

Developing digital archive of APAARI documents was suggested to maintain the information resources of APAARI for future use.

Collaboration with SPC, SAARC Agriculture Centre, SEARCA, FARA, AARINENA, CACAARI, FORAGRO and Asian Institute of Technology (AIT) and with other ARD organizations in the region through GFAR, was approved.

APARIS to become Asia-Pacific Nodal Point for GFAR's Coherence in Information for Agricultural Research for Development (CIARD). APARIS should also perform a catalytic role in developing information standards, IPR issues related to information and security.

Bioversity International and the Rural Development Administration (RDA), Korea inaugurated the Centre of Excellence for International Cooperation and Training at Suwon on 9 September, 2009. The centre will conduct training on different aspects of PGR management including *in vitro* and cryopreservation, non-orthodox seed handling and molecular analysis.

Mr. Jae-Soo Kim, RDA Administrator and Dr. Emile Frison, Director General, Bioversity International were guests of honour, along with eminent figures working in the field of PGR and senior management of RDA. "This centre will continue to share knowledge on PGR management and develop new variety and material for the experts from countries in the region to enhance the diversity of genetic resources" said Mr. Jae-Soo Kim in his opening speech. Emphasizing the importance of plant genetic resources Dr. Frison remarked, "Biodiversity is a basis for agriculture and for the maintenance of life on the earth. For



Inauguration of the Centre of Excellence

several thousands, farmers and scientists have supplied foods and clothes through the utilization of genetic resources. Recently, the importance of genetic resources has been more emphasized to tackle poverty and climate change".

(Source: Dr. Taek-Ryoun Kwon, Bioversity International, t.kwon@cgiar.org)

Green Technologies for a Better Life and a Cleaner Environment

Agriculture is still the dominant force in providing food for the world's population. Production techniques must be further developed and production areas expanded to be able to maintain agricultural yield thus providing food for the masses.

Green technologies are innovative technologies that can promote efficient, high quality and very safe agricultural products. They are of great help to small-scale farmers to increase their incomes and further improve farm productivity through sustainable production techniques that are environmentally friendly and good for human health. Hence the 2009 FFTC-PCARRD International Workshop on Development and Adoption of Green Technologies for Sustainable Agriculture and Enhancement of Rural Entrepreneurship was held on September 28 – October 2, 2009 at IRRI, Los Baños, Laguna.

The first session dealt with issues about the role of green technologies on food safety and quality. Green technologies such as grafting that can eliminate crop diseases, guided soil information system for effective cultivation and production of crops, and production of organic fertilizer from farm wastes are just some of the many techniques. These technologies have been applied in countries like Chinese Taipei and Korea, where farmers have been practicing them for years. This shows that green technologies are already viable and applicable in Asia. Unfortunately in other countries, farmers and consumers are unable to benefit from these technologies mainly because they still do not have adequate access to them. The Philippines can access and adopt these technological advancements in the agriculture sector. However, appropriate support from government and collaborations with international agencies are needed that can shore up the technical and financial needs.

The second session embarked on the specific technologies for the production of non-staple crops such as orchids, cut flowers

and fruits that have health benefits. Green technologies can support and improve the functionality, characteristics and medicinal content of high value commodities. These technologies are already available and are being applied to the above mentioned high value commodities, as they are big industries in Chinese Taipei and Thailand. The huge market for Shikwasha and Ume fruit of Japan, which are not only used as culinary materials but also have health benefits is an example. Furthermore, some exporters of orchids and cut flowers are still relying on the grading system of the producer and not on the market. Thus, the challenge is to further improve the market of these commodities since some of them have not yet been introduced to other countries in Asia and observe the grading systems of the market in order to be globally competitive.

The last session was devoted to discussions on successful stories and experiences on enterprise development programs that involve the adoption and promotion of green technologies. Organic farming has its advantages to farmers specially the smallholders since it can possibly provide them adequate or even higher income and develop rural entrepreneurship in their area. It has been a challenge for this kind of venture to materialize because it incurs a huge amount of marketing cost, there is a difficulty in mainstreaming organic agriculture for farmers' better access, linkages and government support. However, some strategies are suggested for the enhancement of smallholder farmers such as clustering of the pre-production, production, processing and marketing operation within the supply and value added chain. In addition, there is also a need to organize smallholder producers into closely linked and coordinated functional groups provided with common facilities, technologies and other support system.

(Source: Dr. P.S. Faylon, PCARRD, p.faylon@pcarrd.dost.gov.ph)

RECSEA-PGR Meeting and Workshop

Member countries of the Regional Cooperation in Southeast-Asia for Plant Genetic Resources (RECSEA-PGR) gathered at the 6th RECSEA Network Meeting and Capacity Building Workshop in Los Banos, Laguna, Philippines on 19-21 May, 2009 to develop strategies for stronger regional cooperation and agree on common priorities for future work. The RECSEA member countries (Philippines, Malaysia, Indonesia, Vietnam, Laos, Thailand and Myanmar) participated in the meeting. Both country focal persons for plant genetic resources management and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) implementation were invited.



Participants of the RECSEA-PGR Meeting

The workshop revisited the conservation needs in the face of national resource constraints and nutritional insecurity, and identified common concerns in the region for the global conservation community to support. There were also workshops on the implementation of the ITPGRFA (by Treaty Secretariat) and on crop regeneration (by the Global Crop Diversity Trust). Participants engaged in group discussions on implementing the ITPGRFA successfully in the region, capacity building needs and regional cooperative efforts on crops regeneration.

The 6th RECSEA Network Business Meeting was held after the workshop. One of the issues discussed was the lack of confidence of policy makers on the PGR system which hampers the availability of funds. The members unanimously agreed to explore the possibility for RECSEA-PGR linking with ASEAN secretariat.

The Chair of the Indonesia National Commission of Genetic Resources was also elected to serve as the chairperson of RECSEA for the next two years. He replaced Dr. Patricio Faylon, Executive Director of the PCARRD, who has been chair since 2004.

On the question of the relevance of regional networks, it was felt that networks are important pathways in enhancing dissemination of research outputs, making research more effectively implemented, and ensuring integration and upscaling of research and development activities in the region. Organizations like Bioversity, Korea Rural Development Administration (RDA), The World Vegetable Center (AVRDC), Asia-Pacific Association of Agricultural Research Institutions (APAARI), International Rice Research Institute (IRRI), and Global Crop Diversity Trust (GCDT) expressed support to an active and strong regional PGR network where members are active in managing their affairs and advocating stronger regional cooperation and PGR exchange.

Next Steps

The network members agreed to pursue a workplan on capacity development wherein member countries will host such events taking care of local expenses while the other member countries will pay for their participation if no external funding is available.

The members also agreed to come-up with a regional proposal on the on-farm conservation and utilization of underutilized food crops like heirloom tubers, taro, yam, and indigenous vegetables. The members also committed to a greater collaboration within the region on genetic exchange of materials under the spirit of ASEAN solidarity.

(Source: Dr. Leocadio S. Sebastian, Bioversity International, l.sebastian@cgiar.org)

The New APAARI Website

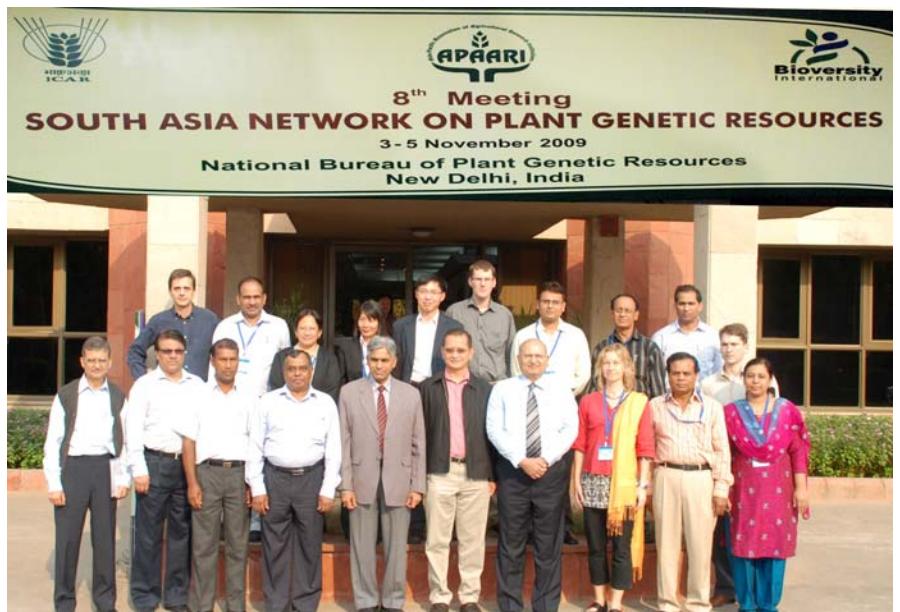
APAARI has launched its new website in August 2009 with a new design, user-friendly information and navigational options. It is available at www.apaari.org. The new website provides access to more than 30 success stories, 35 issues of APPARI Newsletter, and more than 40 reports and proceedings of expert consultations. The website provides links to NARS in Asia and the Pacific region, partners like FAO, CGIAR, GFAR, AARINENA, FARA, CACAARI and directories such as research networks, projects database, ASTI databases, regional research networks etc. The website is being updated on regular basis with upcoming events, activities completed and latest publications. It is planned to offer discussion forum, after RSS feeds, Web 2.0 and Social Networking Tools soon for dissemination of agricultural research information efficiently.

VIII Meeting of the South Asia Network on Plant Genetic Resources (SANPGR)

The eighth meeting of South Asia Network on Plant Genetic Resources (SANPGR) was held at the National Bureau of Plant Genetic Resources (NBPGR), New Delhi from 3-5 November, 2009. The event was jointly organized by Bioversity International, APAARI and the Indian Council of Agricultural Research (ICAR). SANPGR is a sub-regional network established with the aim of improving conservation and use of plant genetic resources through collaborative efforts amongst the member countries in the South Asia region. The network aims to foster collaboration among the partners to identify priorities, undertake joint research and development, share materials, expertise and information and provide a suitable platform for developing common policies on plant genetic resources and related issues. The meeting was organized to revisit the regional genetic resources conservation needs and to identify common concerns in the region for the global conservation community to extend support. The meeting was also to develop joint proposals to strengthen PGR conservation and use in the sub-region. There were 28 participants representing SANPGR member countries (Bangladesh, Bhutan, India and Nepal), Asia-Pacific Association of Agricultural Research Institutions (APAARI), The Global Crop Diversity Trust (GCDT), Food and Agriculture Organization (FAO), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Rice Research Institute (IRRI), International Potato Center (CIP), International Center on Underutilised Crops (ICUC)/Crops for the Future and Bioversity International staff from Rome, APO and New Delhi Office.

The theme of the proposed meeting was 'SANPGR: Facing the Challenges with Stronger Regional Cooperation'. This theme embodied the need for SANPGR network members to work together in the face of national resource constraints, nutritional insecurity and the need to meet the global concerns on climate change and legal instruments that are in place. During the meeting, the participants reviewed the status regarding conservation and use of PGRFA following Global Plan of Action; implementation of Treaty in their respective countries and its impact in the context of developing SMTA at the sub-regional basis; and also to review the activities supported by the GCDT in the region. The main outputs were as under:

1. SANPGR members agreed to share the information on their germplasm collections and a germplasm collection directory will be published.
2. SANPGR members agreed to share germplasm/released varieties of mungbean and a multi-country varietal trial will be set up for their testing.
3. NBPGR to explore the possibility for the establishment of Center of Excellence on "Agrobiodiversity Informatics", where the national partners from the region can be trained on PGR documentation.
4. SANPGR members agreed to develop joint proposals focusing on: conservation and use of crops for the future in



Group Photograph of SANPGR Participants

South Asia and their wild relatives for food and nutrition at household level and also to mitigate the impact of changing climate; and on conservation and use of crop wild relatives of important crops for sustainable agriculture.

5. Regarding capacity building in the sub-region, it was agreed that in addition to existing center of excellence on *in vitro* and cryopreservation techniques, there is need to strengthen capacity in the field of: (i) PGR documentation, (ii) *in situ* on-farm conservation, and (iii) pre-breeding/germplasm enhancement. Bioversity, APAARI and FAO agreed to provide all possible support to SANPGR members to establish centers of excellence to provide training in these priority areas.
6. During the meeting, the progress on the follow up of GPA activities by FAO and regeneration of existing *ex situ* collections by the Trust were reviewed and the progress was found satisfactory.
7. SANPGR members agreed that its Secretariat be established at NBPGR, New Delhi (presently hosted by Bioversity International, South Asia Office, New Delhi), which will function in close collaboration with Bioversity International, South Asia Office. SANPGR members also requested India to continue being Chair of the SANPGR Steering Committee for one more term with Bangladesh as Vice-chair.

(Source: Dr. P.N. Mathur, Bioversity International, South Asia Office, New Delhi, p.mathur@cgiar.org)

**APAARI Family Wishes You a
Very Happy, Prosperous and Successful
New Year 2010**

Expert Consultation on Crops for the Future

The Expert Consultation on "Crops for the Future: Towards Food, Nutrition, Economic and Environmental Security in the Pacific" was organized by the Secretariat of the Pacific Community (SPC), Crops for the Future (CFF), National Agriculture Research Institute (NARI), Papua New Guinea, Bioversity International and APAARI from 21-22 September, 2009 at Nadi, Fiji. It addressed the issues of more effective utilization of crop diversity to manage climate change and to increase local food production while ensuring their effective conservation. Whilst underutilized plants have been recognized as having potential to address food security and malnutrition by alleviating an over-reliance on a few main staple crops and imported processed food, lack of information and documentation on underutilized species in the Pacific, lack of policy support from various



Group Photograph of the Participants

government agencies and, in general, poor awareness at all levels about the value and potential of underutilized species were stated as impeding elements for meaningful progress in the utilization of these crops. The meeting was called to address these issues and consult with representatives from the Pacific Island countries on a strategy and way forward to include underutilized crops into the 3rd phase of the PAPGREN network.

Thirty participants from 14 countries (Cook Islands, Commonwealth Northern Mariana Islands, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu) as well as regional and international organizations (CFF, APAARI and Bioversity International) participated. Priority species lists were developed on the sub-regional basis in the working group sessions. Clear regional priorities were identified, namely breadfruit (*Artocarpus altilis*), bananas of the Fe'i group and/or Pacific plantain, Polynesian chestnut (*Inocarpus fagifer*) and *Pometia pinnata*. Several other crops were highlighted during discussions namely, bele (*Abelmoschus manihot*), *Pandanus* spp., and the lesser aroids (*Alocasia* spp., *Xanthosoma* spp. and *Cyrtosperma merkusii*). A second working group session looked at two major pillars of underutilized crops R&D in the region: Research for development impact and knowledge sharing. These working groups developed the Strategy for Crops for the Future in the Pacific. The Strategy consists of six interrelated elements: generation and collection of knowledge/research; communication and dissemination; policy advocacy; market development; partnerships; capacity building and institutional strengthening. Funding for this important consultation was provided by NZAID, CFF, NARI, APAARI and Bioversity International.

Annual Meeting of the PAPGREN and Genebank Management Training Held

The Pacific Agricultural Plant Genetic Resources Network (PAPGREN) was established by Bioversity International and Secretariat of the Pacific Community (SPC) in 2001 to strengthen national and regional capacity in the conservation and use of plant genetic resources for food and agriculture, contributing to nutritional security, health and income generation in the pacific. PAPGREN is being coordinated by the Land Resources Division of SPC with the technical assistance from Bioversity International and the financial support from New Zealand's International Aid and Development Agency (NZAID) and AusAID. Most of the PAPGREN activities are focused to: (i) develop appropriate management strategies for agricultural PGR in the Pacific, (ii) promote the safe exchange of germplasm within and outside the region, (iii) develop and co-ordinate documentation of agricultural PGR, (iv) enhance awareness of the importance of PGR at the national and regional level, and assist in the development of national and regional policies to promote conservation and sustainable use of PGR with adequate sharing of benefits. PAPGREN Annual Meeting for 2009 followed by genebank management training was organized by SPC in collaboration with Bioversity International from 26 September to 2 October, 2009. Thirteen countries (Cook Islands, Commonwealth Northern Mariana Islands, Fiji, French Polynesia, Kiribati, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu), one NGO from Solomon Islands and five international and regional organizations (Bioversity International, Crops for the Future, SPC, Global Crop Diversity Trust (GCDT) and the University of the South Pacific) took part. Progress reports were presented by each country. The significant achievements include: (i) national workshops/consultations were organized in selected countries which helped in capacity building and raising awareness on PGRFA; (ii) enhanced capacity building through Masters' scholarships, group training, sharing of national expertise and the development of distance and flexible learning modules; (iii) web-based directory of Pacific collections for its wider circulation; (iv) establishment of field genebank for conservation of unique pacific banana collections by French Polynesia; (v) better appreciation of diversity and the benefits that such diversity can provide; and (vi) the publication and distribution of documentary DVD by Kastom Garden on organic farming, plant material network conservation evaluation of materials released by CePaCT and its effect on nutrition and food security.

In addition to on-going PAPGREN activities, the participants were exposed to the National Information Sharing Mechanism (NISM), developed by FAO. Presently, four pacific countries (Fiji, Palau, PNG and Samoa) are member of this network. A special session was also organized to focus on Global Conference on Agricultural Research for Development (GCARD) to discuss key issues of research for development in the Pacific region. The participants also witnessed the official opening of the new Centre for Pacific Crops and Trees (CePaCT) building complex located at the SPC compound in Narere, Fiji.

The Rice Department, Ministry of Agriculture and Cooperatives of Thailand hosted the 13th Council on Rice Research in Asia (CORRA) meeting on 29-30 October, 2009 at the Grand Mercure Fortune Hotel, Bangkok, Thailand. CORRA brings together the senior research leaders of 16 major rice producing and consuming nations every year to discuss the main issues and challenges facing the Asian rice industry.

The meeting discussed recent technological developments in IRRI and the proposed changes in the CGIAR system. The meeting also featured rice developments in China, Indonesia, Nepal and Laos, including their country's positions on contemporary concerns on impact of climate change in rice productivity, genetically modified rice and the System of Rice Intensification (SRI). As a summary of the meeting, CORRA has endorsed the following declarations and recommendations.

1. Food Security and Investment Needs in Rice R&D: as the council and leader for rice research in Asia, CORRA remains concerned about food security and encourages Asian nations to accelerate investment in rice-related R&D at national and international levels. The body has taken note of recent discussion and the commitment of the G8 to invest \$20 billion additional money to agricultural development, in which Asia should be given a high priority.

2. Implications of Climate Change for Rice Growing Countries: CORRA hopes that clear policies and decisions can be agreed upon during the upcoming Global Climate Change Summit in Copenhagen that will also benefit rice farmers, both in terms of protecting them against the impact of negative climate change and in terms of enabling these countries to implement measures for mitigating greenhouse gas emissions. Rice farmers in Asia can make a significant contribution to mitigating greenhouse gas emissions, but mechanisms must be established that will allow them to participate in the appropriate carbon trading schemes worldwide.

3. Genetically Modified Rice: as a group of research leaders in rice, CORRA generally supports a strong effort on utilizing modern biotechnology in rice improvement. The body recognizes the different country priorities and policies, particularly with regard to GM rice. CORRA believes that in the longer term, GM rice will have to play a significant role for sustaining food security, in improving the nutrition, and in making rice production systems resilient to climate change. Over the longer term, safe and scientifically sound GM rice solutions should become part of Asia's rice production systems, while recognizing the different priorities and policies in each country.

4. Systems of Rice Intensification (SRI): The available information on SRI in member countries does not suggest that this is a unique and universally applicable new management technology. Many locally modified versions of what is called SRI have evolved in different countries. They



Dr. Kenji Iiyama Chairing CORRA Meeting

are often difficult to distinguish from other recommended, well-known crop and resource management practices. True adoption of originally proposed SRI packages has remained spurious. The body is in favor of any production technologies that improve the management of the rice crop but it also recognizes that the potential of SRI will vary from country to country and also from location to location, largely dependent on specific environmental and socioeconomic conditions, particularly the availability of labor. Therefore, CORRA cannot, by the evidence available, suggest that SRI could provide a widely applicable or universally significant enhancement of rice production in Asia.

5. Global Rice Science Partnership (GRISP): given the need to strengthen the agricultural R&D system for rice worldwide and focusing it on integrated management solutions for major rice-based production systems, CORRA endorses the concept of creating a Global Rice Science Partnership that would allow to harmonize the strategic plans and activities of international agricultural research centers, international organizations with research in rice, and the national rice research organizations, for greater efficiency and synergy and higher level of investments. CORRA fully supports the establishment of such an integrated global rice program within the context of a changing CGIAR system.

6. Global Rice Information Gateway: given the tight global rice supply – demand balance and the volatile situation in the world rice market and the significant lack of high quality, real time information on rice production at national, regional, and global levels, CORRA sees an urgent need to support the development of a global rice information gateway. Such an information and decision support system could provide important analytical support for key rice producing countries. CORRA strongly supports this new initiative.

The CORRA participants agreed to hold the 14th CORRA meeting in Korea, back to back with the APAARI meeting in mid October 2010. The proposed agenda will include progress report on the global rice situation, climate change and its effect on rice situation, national strategies to mitigate and adapt to climate change (selected country reports), and a review of CORRA after 13 years of existence.

(Source: Dr. J. Lapitan, IRRI, j.lapitan@cgiar.org)

The NGO Association for Agriculture Research in Asia-Pacific (NAARAP) was formed after a regional workshop organized jointly by the Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOC), Asia-Pacific Association of Agricultural Research Institutions (APAARI) and the Global Forum on Agricultural Research (GFAR) in Bangkok, Thailand during 16-18 April, 2008. A major goal of NAARAP is to engage with APAARI, GFAR and other international and global organizations to facilitate a change in the orientation of agricultural research for development (ARD), particularly by adopting a systems approach where Smallholder Farmer Organizations (SFOs) and CSOs can play integral roles in determining the direction, content and conduct of ARD.

Report of NAARAP Secretariat

Since its formation in April 2008, the NAARAP Secretariat has participated either as resource person, panelist or facilitator to at least four regional workshops organized by various international institutions (e.g. International Fund for Agricultural Development, Asian Development Bank, United Nations, Association of Southeast Asian Nations, regional NGO networks). In these events, NAARAP stressed the need to prioritize agriculture for small farm holders, the importance of agrarian reform, the promotion of sustainable agriculture as a viable option to reduce poverty and the critical path towards redefining the priorities on agricultural research. NAARAP was presented as one of the mechanisms that these institutions can partner with to bridge governments, development partners, CSOs and farmers' organizations.

NAARAP Secretariat is being hosted by ANGOC. It has created the association's web log at naarap.blogspot.com. The site features news about activities promoting NAARAP and its policy agenda with agricultural research systems towards agro-ecological and sustainable agriculture and smallholder farming.

In terms of engaging APAARI and GFAR, ANGOC hosted a meeting with the NGO Representative to the GFAR Steering Committee to explain the objectives of NAARAP in the Asia-Pacific region. The Secretariat participated in APAARI 10th General Assembly, where the representation of NAARAP to the latter's Executive Committee was formally ratified.

NAARAP Caucus Meets

A meeting of NAARAP Caucus was held in Bangkok on 31 October, 2009 under the chairmanship of Fr. Francis Lucas. APAARI and GFAR were represented by Drs. Raj Paroda and Ajit Maru, respectively. The key decisions in the meeting taken were: (i) the creation of an Interim Executive Committee, (ii) the approval of NAARAP updates (narrative and financial), and (iii) the use of Information and Communication Technologies (ICTs) to develop the Charter and Modes of Operation as well as the Road Map of NAARAP.

Formation of Interim Executive Committee

The participants decided to create an Interim Executive Committee for NAARAP until its Charter has been approved by the Membership. The group agreed that the Committee shall be composed of the sub-regional focal points (i.e., CANGO,

SARVODAYA, ANGOC, PIANGO) and a member of the resource generation committee (DST).

Better use of ICTs for Information Exchange

The NAARAP members acknowledged the need to maximize ICTs for information exchange and to promote the association to different groups. The sub-regional points were asked to proactively assist the Secretariat in motivating the other members to submit information/updates. Another suggestion was to establish an E-group among NAARAP Members as well as APAARI and GFAR members and partners. APARIS has volunteered its technical expertise to assist NAARAP in terms of information technology and for hosting its website.

Developing the NAARAP Charter and Road Map

The working document on NAARAP's Draft Charter and Modes of Operation prepared by the Secretariat will be e-mailed to all participants, including the Interim Executive Committee for feedback. Dr. Raj Paroda of APAARI and Dr. Ajit Maru of GFAR committed to share their Charters as reference documents. Dr. Maru will also share the Charter of the African NGO Forum.

The revised draft of the Charter and Modes of Operation will be discussed through an electronic consultation. For the NAARAP road map, the Secretariat presented a brief overview for the next two years. The key strategies will revolve on:

- Designing an interactive communication mechanism among NAARAP members and with APAARI and GFAR.
- Activating NAARAP at the national level to facilitate opportunities for dialogues and engagement among the major stakeholders in the ARD processes for food security and poverty alleviation.
- Drafting of NAARAP Governance Framework and Modes of Operation.
- Resource mobilization strategy, including seeking possible support for activities from both APAARI and GFAR.

(Source: Mr. Nathaniel Don Marquez, ANGOC, Philippines, nathanieldon@yahoo.com)

Condolence

APAARI notes with deep regret the loss of Dr. Norman Borlaug, the father of "Green Revolution". Through his "miracle seeds", Dr. Borlaug saved more lives in the world than any body else. His outstanding scientific contributions along with tireless efforts for scientific and policy support for agriculture brought revolutionary transformation of agriculture, especially in Asian countries. His achievements are a testimony to the far reaching good that one man's efforts can make to the lives of underprivileged people of the world.



Success Story of Mungbean

The work of AVRDC—The World Vegetable Center in mungbean improvement and technology dissemination is one of 20 case studies selected from a field of 250 for inclusion in a book entitled "**Millions Fed: Proven Successes in Agricultural Development**" published by the International Food Policy Research Institute (IFPRI) launched on 12 November, 2009. The book is part of a larger initiative funded by the Bill & Melinda Gates Foundation to highlight the efforts that have brought millions of people out of hunger over the past 50 years.

As heads of state gather in Rome for the World Summit on Food Security, *Millions Fed* will aim to draw their attention to projects that have had substantial, long-term impact and by comparison, emphasize the need for investment in agriculture today.

The chapter "The Mungbean Transformation: Diversifying Crops, defeating malnutrition," co-authored by Dr. Sundar Shanmugasundaram, former AVRDC Director of Research, Director General Dr. Dyno Keatinge, and Deputy Director General-Research Dr. Jackie Hughes, presents AVRDC's achievement in increasing mungbean yield, improving production, expanding markets, improving nutrition, and building networks to foster informed policymaking across Asia.

"Each of these cases tells a different story of what worked, how, and why," explained David Spielman, IFPRI research fellow and book co-editor. "While no single story offers a complete solution to ending hunger, each one illustrates the importance of combined approaches to achieve success, including good science, collaboration, visionary leadership, community action, and progressive policies."

The rigorous selection process for case studies included an open call for nominations, an extensive literature review, and expert interviews. Nominations were evaluated for long-lasting change supported by well-documented evidence of real impact. Initiatives also had to be large-scale, reaching hundreds of thousands or millions.



Bountiful Production of Mungbean

"Agriculture is central for development, and development requires investment," said Dr. Sundar. "AVRDC's mungbean project successfully deployed funds from the UK Department for International Development to help build strong research networks across Asia." Thirty years ago, mungbean was a marginal crop, he said. Today, this protein-rich, easy-to-digest pulse adds variety and nutrition to diets all across Asia, and diversifies cereal crop rotations to benefit farmers and the environment. Mungbean being a short duration crop can fit in well in the predominant rice-wheat production system of the Indo-gangetic plains in South Asia.

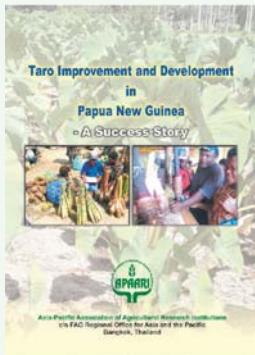
Millions Fed and Highlights from Millions Fed, a shorter version of the case studies: <http://www.ifpri.org/book-5826/millionsfed/pubs>

Promotional *Millions Fed* video: <http://www.youtube.com/IFPRI>

(Source: Mr. Maureen Mecozzi, AVRDC, maureen.mecozzi@worldveg.org)

Latest APAARI Publications

1. Success Story on Taro Improvement and Development in Papua New Guinea
2. CD of APAARI-2009 and a New Poster



Eight New APAARI Members

Allahabad Agricultural Institute (AAI), India; Agriculture Research Institute of Afghanistan (ARIA), Afghanistan; Birsa Agricultural University (BAU), India; Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI), Uzbekistan; International Center for Tropical Agriculture (CIAT), Colombia; Indian Agricultural Universities Association (IAUA), India; Sugar Research Institute of Fiji (SRIF), Fiji; and Secretariat of the Pacific Community (SPC), Fiji have became new members of APAARI. APAARI family welcomes them.

Developing Designer Eggs for Health: Technological Innovation at MARDI

The interest in functional foods, nutraceuticals or designer foods has resulted in new foods in the marketplace designed to address specific health concerns. In this context, the Strategic Livestock Research Centre at Malaysian Agricultural Research and Development Institute (MARDI), Malaysia, has been working in the development of designer or nutrient-enhanced eggs, realizing that appropriate changes to the layer diet can influence deposition of certain key nutrients in the egg.

Development of Designer Eggs

To develop the Omega-3, Selenium and Vitamin E enriched egg with lower cholesterol, a mixture of feedstuffs comprising maize, soybean meal, rice bran, flaxseed, sesame meal, wheat pollard, dried distillers grains with solubles, crude palm oil as well as supplements of amino acids, mineral/vitamin and enzymes was used. Dietary manipulation of the levels of omega-3 polyunsaturated fatty acids and antioxidants in the least cost formulation rations resulted in designer eggs enriched with the desired nutrients. The level of these nutrients in the egg is also dependent on the breed of the layer, age of the bird and length of feeding period supplementation. Plant sterols reduce the cholesterol content in the egg, while the selenium and vitamin E supplements help to alleviate the adverse effects of chronic heat stress in laying hens thus maintaining high egg production. Egg quality (measured by Haugh Unit readings) over storage was better than those of regular eggs.

Advantages of the Technology

- Cost-efficient process easily adopted by commercial farms for high volume egg production.
- Use of existing farm production infrastructure (housing, feeding system, farm management, egg collection and grading facilities) with minimal feed processing.
- Use of existing commercial layer breeds.
- Applicable to a range of feed ingredients, protein and metabolizable energy diets.
- Improved egg production efficiency during heat stress.
- All-vegetarian feed ingredients with natural carotenoids (capsanthin and capsorubin).
- Antibiotic-free and Salmonella-free product.
- Better storage stability than regular eggs.
- Continuous upgrading of product with R&D input.
- Look, cook and taste the same as regular eggs with better functional properties.

The Product— Designer Eggs

These designer eggs are enriched with beneficial nutrients such as omega-3 polyunsaturated fatty acids, selenium, and vitamin

E and have reduced cholesterol content. As health and nutrition experts recommend decreasing food cholesterol intake, the low cholesterol content in these eggs makes it a healthier egg alternative.

- Up to three times more selenium than regular eggs
- Up to five times more omega-3 than regular eggs
- Up to ten times more Vitamin E than regular eggs
- Reduced cholesterol (25% less cholesterol than regular eggs)

Commercialization

MARDITECH Corp. a subsidiary of MARDI has successfully



Selenium Enriched Eggs

licensed the technologies to a leading egg producer in the country for commercial production. Designer eggs produced using these technologies are sold under the LTK Organic Selenium Plus, LTK Omegaplus and exported under the Telur Mas brand. More than 400 million eggs produced from these technologies have been sold.

Novelty of Innovation

This technology has enabled the local poultry industry to diversify its existing product range and create a differentiated product with its own market niche for the domestic and export market. Another advantage is that the technology can be continuously upgraded to incorporate new research ideas to enhance the product and further develop derivative products.

The production process uses a zero waste discharge system and all the poultry litter is composted and sold as bio-fertilizer. The bio-composting process is done in a fully enclosed compost treatment facility resulting in no odour, no green house gas emission and no problems with flies.

(Source: Dr. Wong Hee Kum, MARDI, hwkong@mardi.gov.my)

Moitree : A New Lentil Variety Released in India

A new lentil variety named Moitree (meaning Friendship) developed by the Pulses and Oilseed Research Station, Berhampore, West Bengal, India from ICARDA-supplied genetic material, has been released by the central variety release authority for cultivation in eastern Indian states. It represents a major breakthrough, for two reasons. First, it is resistant to two major diseases, rust and *Stemphylium* blight. These diseases have forced farmers in northeast India to abandon lentil cultivation, because all currently grown varieties and landraces are susceptible. Second, it can be planted even one month later than normal sowing without significant loss of yield. That makes it ideal for a specific niche, i.e. the relatively short period following the rice harvest, when fields are usually left fallow. It grows fast and has early ground coverage to use conserved moisture in mild winter.

Moitree was developed through single plant selection by Indian breeders from a segregating population developed at ICARDA headquarters in Syria— which was developed by crossing a Pakistani landrace with a Bangladeshi breeding line, in an effort to breed new varieties for specific short-season environments. F_3 progenies from the cross were distributed to national research centers in Bangladesh, Ethiopia, India and Nepal. Indian scientists at the Pulses and Oilseed Research Station, Berhampore, West Bengal, then took the process forward. The Indian team comprised Drs. Anita Aich, S.S. Aich, M. Bhowmick, C.K. Bhunia, M.P. Srivastava, S.K. Roy and S. Gupta. Dr. Ashutosh Sarker, ICARDA's Lentil Breeder made crosses specifically for short-season environments of Indian sub-continent and delivered the materials to India.

From 2002 onwards, the new line was tested on-station and on-farm, for several seasons, to evaluate yield, disease resistance and agronomic characters. In on-station trials it gave 50% higher yields than existing cultivars. On farmers' fields, it out-yielded the check varieties by 34 to 57%, with average yield



Dr. Sarker and Colleagues at a Farmer's Field

of 1150 kg per hectare, compared to 830 kg from the highest-yielding check variety. Moitree also has wide adaptation, and has been recommended for cultivation in four states: West Bengal, Assam, Bihar (eastern) and Jharkhand.

Feedback from farmers has been excellent: "Moitree is a blessing... for the first time we can get steady yields from lentil," said one farmer, who plans to double his lentil plot next year. The variety is being scaled out through demonstrations on farmers' fields across West Bengal. It is expected that through massive extension/dissemination activities in the coming years, the variety will be adopted by farmers and will create an impact through increased farm income and nutritional security to the rural consumers.

(Source: Dr. Ashutosh Sarker, Regional Coordinator, ICARDA, South Asia Office, a.sarker@cgiar.org)

Training Program on Conservation of Plant Genetic Resources

APAARI in collaboration with Bioversity International and Indian Council of Agricultural Research (ICAR) organized an International Training Course entitled "In Vitro and Cryopreservation Techniques for Conservation of Plant Genetic Resources" at National Bureau of Plant Genetic Resources, New Delhi during 9-21 November, 2009. Eleven participants including four sponsored by APAARI (one each from PNG, Chinese Taipei, Thailand and Vietnam) joined the training course which comprised lectures and practical exercises on management of plant genetic resources; overview of *in vitro* and cryopreservation in plant germplasm conservation; *in vitro* and cryopreservation techniques; and molecular markers for genotype identification and genetic stability testing. The trainees also got opportunity to discuss their research programs with the international experts invited for conducting the training.

(Source: Dr. J.L. Karihaloo, Coordinator, APCoAB, j.karihaloo@cgiar.org)



Group Photograph of Participants

The Secretariat of the Pacific Community (SPC) in Fiji Opens State-of-the-Art Biodiversity Centre

The new SPC Centre for Pacific Crops and Trees (CePaCT), located some 10 km outside of Suva, Fiji is the first modern genebank built to international standards in the Pacific Islands region. A regional genebank was first conceived by the Pacific Ministers of Agriculture in 1996, when they recommended a regional approach to conservation of crop diversity, acknowledging the significance of crop diversity to food and nutritional security. The same sentiment was expressed by the SPC Deputy Director, Ms Fekitamoeloa 'Utoikamanu, in welcoming guests to the opening of the new complex, when commenting that "the Centre provides an excellent example of how regionalism works. Due to economies of scale, and the financial and technical resource requirements, a setup like CePaCT would be alarmingly difficult to be established in each of the member states. However, with the pooling of resources to establish this state-of-the-art biodiversity centre, technical services in plant genetic resources to member countries are upgraded and maintained."

Conservation is the core business of the Centre with priority given to the region's staple crops. However, CePaCT is very active in making germplasm available to countries, having distributed over 24,819 plants in the period 2004-08. *In vitro* techniques are used to conserve a wide range of crops, namely alocasia (*Alocasia macrorrhiza*), banana (*Musa* spp.), bele (*Abelmoschus manihot*), black pepper (*Piper nigrum*), breadfruit (*Artocarpus altilis*), cassava (*Manihot esculenta*), cyrtosperma (*Cyrtosperma merkusii*), Irish potato (*Solanum tuberosum*), kava (*Piper methysticum*), pandanus (*Pandanus tectorius*), sweet potato (*Ipomoea batatas*), taro (*Colocasia esculenta*), vanilla (*Vanilla fragrans*), xanthosoma (*Xanthosoma sagittifolium*) and yam (*Dioscorea* spp.). The taro collection is unique, acknowledged as the largest *in vitro* collection in the world consisting of over 850 varieties from the Pacific and Asian countries including improved lines obtained through collaboration with breeding programs in Papua New Guinea and Samoa. The importance of both the taro and yam collections to food security have been recognized globally with the recent signing of a long-term agreement with the Global Crop Diversity Trust providing funding support *ad infinitum* for these collections. This is the first long-term grant provided by the Trust to a collection outside of the Consultative Group for International Agricultural Research (CGIAR).

In June 2009, CePaCT became part of the global system, which facilitates the sharing of plant genetic resources. The fact that no one country is self-sufficient in crop diversity or plant genetic resources for food and agriculture is the basic premise of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)- a global treaty for food security. The Treaty is vital in ensuring the continued availability of the plant genetic resources for food and agriculture that countries will need to feed their people. At the opening of 3rd Session of the Governing Body to the Treaty, the Honourable Taua Kitiona Seuala, Samoa Minister of Agriculture, formally placed the



A View of the Inauguration of CePaCT Centre

collections of the CePaCT, held in trust for the Pacific Island Countries and Territories, into the Multilateral System of the Treaty. In his address to the Governing Body of the Treaty, he said "The signing of these agreements by SPC has been fully endorsed by the Pacific region, recognizing we live in one world, despite the miles that often exist between us all, and to survive the many challenges of this century we need to work together, sharing our resources and importantly further recognizing that genetic diversity found in genebanks today may become the most important resources we have in shaping an effective response to climate change."

SPC's work on genetic resources also includes the Pacific Plant Genetic Resources Network (PAPGREN) established in 2004 to strengthen capacity in the region for conservation and utilization of plant genetic resources for food and agriculture. This network continues to be active in supporting countries in the conservation and utilization of crop diversity. The linkage with PAPGREN greatly strengthens the work of the CePaCT in both conserving the crop diversity of the region and delivering new diversity.

The CePaCT manager and SPC Genetic Resources Coordinator, Dr. Mary Taylor said, "The Centre for Pacific Crops and Trees (CePaCT) is one of a kind in the Pacific and is a resource that has been built up over the years through the commitment of the people of the Pacific, donors and SPC. Importantly, it is a resource the Pacific region now truly values for its role in conserving traditional crops and trees, and providing "new" material to fulfill all the functions required of diversity. With the challenges of the 21st century this role is becoming increasingly important. The demands are huge on the fragile resources of the Pacific, maintain food security with the unpredictability of climate change, address the problems of nutritional security, and respond to the needs of the markets."

(Source: Dr. Mary Taylor, SPC, maryt@spc.int)

Update on Cereals and Legumes Asia Network (CLAN)

Coarse cereals and grain legumes are the major staple food crops of the poor people in the poorest regions of the world—the semi-arid tropics (SAT), characterized by harsh climatic conditions and unstable production. These crops are considered 'orphan crops' with limited support from the national governments for research and development. Hence the Asian National Agricultural Research Systems (NARS) expressed the need for a concerted and coordinated effort to address the production constraints on these crops and to provide technology for increasing their productivity and production.

Mandate crops of Cereals and Legumes Asia Network (CLAN), include sorghum, pearl millet, chickpea, pigeonpea, groundnut, lentil and mungbean and related natural resource management. The main aim of CLAN is to facilitate agricultural research and technology exchange among network member countries and agricultural research institutions to enhance member countries' capabilities for increased productivity and production of network mandate crops.

The Asia Pacific Association of Agricultural Research Institutions (APAARI) in its general assembly meeting held at Penang, Malaysia during 2-4 December, 2002 recommended that lentil (ICARDA mandate) and mungbean (AVRDC- The World Vegetable Center mandate) should be included in CLAN. This inclusion has widened CLAN's scope and responsibility both in rice and/or wheat based cropping systems in Asia.

CLAN is now co-facilitated by ICRISAT, ICARDA and AVRDC- The World Vegetable Center. The coordination unit is located at and supported by ICRISAT, Patancheru. APAARI has committed support to the expanded CLAN, to help sustain the network activities.

The overall objective of the "New CLAN" is to support, coordinate and facilitate research collaboration and technology exchange involving CLAN mandate crops and their resource management among Asian NARS scientists. It is also to strengthen linkages and enhance exchange of germplasm, breeding material, technical information, and technology options among members.

CLAN membership consists of 13 countries in Asia: Bangladesh, China, India, Iran, Indonesia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, Vietnam and Yemen. Activities in Chinese Taipei and Syria also form a part of Network activities. The CLAN Steering Committee meets in alternate years to review the progress and plan future network activities. The CLAN Steering Meeting was expected to be organized during 2009, and hosted by Iran. However, the meeting has been postponed to 2010. The main achievements of CLAN during 2009 are mentioned below:

Germplasm Exchange

- (a) **ICRISAT:** A total of 11094 germplasm samples, 20834 breeding lines, and 522 sets of trials/nurseries were supplied to the member countries
- (b) **AVRDC- The World Vegetable Center:** A total of 54 germplasm accessions and 67 breeding lines of mungbean were supplied to the member countries.
- (c) **ICARDA:** A total of 606 germplasm samples, 1000 breeding

lines and 127 sets of trials and nurseries of lentil were supplied to the member countries.

Varieties Released (2008-09)

Using the germplasm and breeding material provided by AVRDC, ICARDA and ICRISAT, the network member countries have released 37 varieties which includes 3 sorghum, 15 pearl millet, 3 chickpea, 1 pigeonpea, 7 groundnut, 4 mungbean and 4 lentil varieties in Bangladesh, China, India, Indonesia, Myanmar, Nepal, Philippines and Yemen.

Training

- (a) **ICRISAT:** Thirteen training courses were organized [253 participants (207 Male and 46 Female)] to impart training on special skills, new methods and technologies to NARS scientists. Three hundred and thirteen scientists and students including 85 Research Fellows, 53 Research Scholars, and 175 Apprentices have improved their capabilities to conduct research and development activities at ICRISAT.
- (b) **AVRDC- The World Vegetable Center:** Twenty six NARS staff (3 India, 11 Taiwan, 11 Philippines and 1 Indonesia) were trained. Apart from this special training course for 50 women farmers, 8 field demonstrations and 2 field days were also conducted.
- (c) **ICARDA:** Twelve Indian scientists (11 Male, 1 Female) participated in a two week molecular marker training at ICARDA, Syria. Four Individual trainees (2 Bangladesh, 1 Nepal and 1 Pakistan) spent about 3 weeks at Aleppo for training. Food Legume Travelling workshop was organized in India in 2008 with 32 participants (including 2 Bangladesh, 1 Pakistan, 25 India, 3 ICARDA and 1 ICRISAT scientist).

Scientific Exchange

- (a) **ICRISAT:** Forty eight scientists from ICRISAT made 80 visits to Asian Countries (other than India) and spent 607 days to assist NARS Scientists. Eighty three NARS scientists made 33 visits to ICRISAT or ICRISAT supported meetings and workshops and spent 129 person days for research and development activities.
- (b) **AVRDC- The World Vegetable Center:** Four scientists from AVRDC made 3 visits to Asian Countries (other than India) and spent 34 days to assist NARS Scientists.
- (c) **ICARDA:** Twelve NARS scientists (2 Bangladesh, 5 China, 3 India, 1 Nepal, 1 Pakistan) visited ICARDA, Aleppo for exchange of research and Technology information, and planning collaborative research. ICARDA scientists participated in Rabi workshop in India, Annual Research Planning and review meeting in Bangladesh, and Legumes planning meeting in Nepal.

Based on earlier recommendations of APAARI, a joint proposal on incorporation of legumes in several crop based production systems has been submitted for consideration by Donor agencies in the region.

(Source: Dr. C.L.L. Gowda, ICRISAT, c.gowda@cgiar.org)

□ Meeting of the GlobalHort Board of Directors

The 6th meeting of the Board of Directors of the Global Horticultural Initiative (GlobalHort) was held on 12-13 November, 2009 in Bangkok. Coordinator, APCoAB was deputed by APAARI to represent GFAR in the meeting on the request of the latter. The meeting was attended by Prof. Norman Looney, Chairman and representatives of CIRAD, ICDF, CGIAR, IFAD, NEPAD, AVRDC, GFAR and HortCRSP. HortCRSP was represented as special invitee to explore the possibility of collaboration with GlobalHort in view of the common objectives of the two organizations in promoting horticulture for development.

The two day meeting opened with the welcome address of the Chairman, approval of minutes of the 5th Board Meeting, and discussion and approval of the agenda of 6th meeting. Dr. Ronald Voss made a presentation of HortCRSP activities which was followed by discussion on the probable areas of cooperation with GlobalHort. Later, Executive Secretary, GlobalHort presented progress report on activities which along with the work plan for 2010 and proposed budget for 2010 were discussed during subsequent sessions. On the second day of meeting, Chairman, APSA addressed the board members who later interacted with him with suggestions for collaborative activities with GlobalHort. A guided visit of the fruit and vegetable market of Bangkok was organized on 13 November followed by visit to AIT, School of Environment Resources and Development. During the discussion on work plan, APAARI offered to accommodate GlobalHort nominees in its training programs on relevant topics.

□ Workshop on ICM in AR4D

A five-day workshop on "International Consultation on Agricultural Research for Development and Innovation: Addressing emerging challenges and exploiting opportunities through Information and Communication Technologies" was jointly organized by APAARI, GFAR, FAO and ICRISAT at ICRISAT, Hyderabad, India during 7-11 December, 2009. Sixty information and communication experts from 27 countries and 8 international organizations attended the workshop. The main aim was to identify and define new strategies, policies and actions that are needed to enhance and sustain adoption of ICM in ARD keeping the needs of resource poor farmers in focus.

In his message, ICRISAT's Director General, Dr. William Dar, pointed out the importance of information in agriculture, and wanted the workshop to come up with fresh and innovative ideas that could be mainstreamed in the new paradigm of international agricultural research. Inaugurating the workshop, Dr. Dave Hoisington, DDG-Research noted that ICT has immense potential in empowering the farming communities and should be put to greater use by the agricultural research and extension institutions to achieve more positive results. Dr. Ajit Maru of the GFAR defined the theme of the consultations and emphasized that ICT should be treated as frontier technology on par with biotechnology and nano-technology to attract more investments to take on new and challenging tasks of improving the livelihoods of resource-poor smallholders and producers. Dr. Stephen Rudgard of the FAO stressed the importance of ICT and its usefulness in transferring technologies to the poor farming communities. Dr. Attaluri of APAARI said that ICT should be extended to benefit the growing number of farming families, especially in the Asia-Pacific region. Dr. V. Balaji of ICRISAT proposed vote of thanks.

During the workshop, events that included Developing Framework for ICM in ARD, CIARD Asia-Pacific Regional Consultation, ICM4ARD Inter-regional Meeting and Meeting of EGFAR Task Force were organized. The format of the workshop was unique and helped high level of participation and experiential learning through 'marketplace' where posters, prototypes and multimedia tools displayed; group work on investments, capacity / policies and innovations in ICM; research in ICM on advocacy, capacity and coherence in information objects followed by group presentations, plenary sessions, sharing of think pieces and field visits. The outcome of the workshop will feed into all Global Conference on Agricultural Research and Development (GCARD-2010) related processes including those of the CGIAR, CIARD, FAO and GFAR.

□ Bt Eggplant Poised for Commercial Release in India

Following the huge success of Bt Cotton, Genetic Engineering Approval Committee (GEAC), the Indian Regulatory Authority has approved commercial cultivation of genetically modified eggplant (brinjal). GM eggplant carrying *cry1Ac* gene is resistant to fruit and shoot borer (FSB), the most devastating pest of eggplant in India. FSB causes a loss of 60-70% in commercial plantings, to control which farmers apply as many as 40 insecticide sprays.

Bt eggplant has been developed by Mahyco, India's leading seed company which has also donated the technology to a number of national and regional public institutions.

The approval of Bt eggplant follows rigorous testing for biosafety and agronomic performance. While the final release is pending the approval of Indian Environment Minister, cultivation of Bt eggplant is likely to benefit farmers and consumers in a big way. There is likely to be 40% reduction in pesticide application which would translate into reduction in cost of cultivation by approximately US\$ 113/ha. With further advantage of significantly increased marketable produce, a net increased benefit of approximately US\$ 350/ha is from Bt eggplant cultivation is expected over its non Bt counterpart.

APARIS Coordinator

Dr. Attaluri Srinivasacharyulu has joined APAARI as Asia-Pacific Agricultural Research Information System (APARIS) Coordinator on 1st July 2009 on deputation basis from the National Institute of Agricultural Extension Management (MANAGE), Hyderabad, India. Dr. Attaluri holds a Ph.D. in Information Science, a Post-Graduate Diploma in Agricultural Extension Management (PGDAEM) and a Post-Graduate Diploma in Library Automation and Networking (PGDLAN). He has more than 15 years of experience in the areas of Information and Communication Technology (ICT), Documentation and Publication. His areas of specialization include research and capacity building programs in ICTs, agricultural marketing information, process documentation, distance education, market-led extension and mass media support to agricultural extension. He also served the SAARC Agriculture Centre (SAC), Dhaka, Bangladesh as Information Specialist during 2003-2006.



APAARI welcomes him as a new member of the family.

Forthcoming Events / Meetings

The next **APAARI General Assembly** is proposed to be held on 13th October 2010 at International Technical Cooperation Center (ITCC), Suwon, Republic of Korea. The meeting is being hosted by the Rural Development Administration (RDA), Republic of Korea.

International Conference on Food Security and Climate Change in Dry Areas, 1-4 February, 2010, Amman, Jordan

The conference aims to bring together national and international experts and other stakeholders to exchange views and experiences on urgent food security issues expected to be impacted by climate change in the dry areas; identify R&D priorities; cooperation needed between national, regional and international institutions to achieve desired objectives and support required activities to strengthen R&D in this field. The conference will address the following main topics: (i) climate change in the dry areas; (ii) impact of climate change on national resources availability (especially water), agricultural production systems and environmental dry radiation; (iii) impact of climate change and food security and poverty; (iv) adaptation and mitigation strategies; and (v) policy and institutional set up as enabling environments to cope up with climate change impacts. The conference is being organized by ICARDA in collaboration with the National Center for Agricultural Research and Extension (NCARE), Jordan, AARINENA, APAARI and other partners. For more information, visit: <http://www.icarda.org>

International Workshop on Fast Growing Economies' Role in Global Agricultural Research for Development, 8-10 February 2010, Beijing, China

The primary objective of the workshop is to bring together representatives of governments, especially senior policy makers and managers of the public sector national agricultural research systems and institutes, civil society organizations, farmer cooperatives and private sector companies and other ARD actors such as those represented by Regional ARD Forums to foster discussions on the new roles and needs of emerging economies so that they can, through collaboration and partnership contribute further to ARD globally. The outputs from the Workshop will be recommendations after discussing an "Issues to be considered paper" that can be considered by the global ARD community at the Global Conference on Agricultural Research for Development (GCARD 2010). For more information, contact Gianna.deCesare@fao.org

International Conference on Biodiversity in Relation to Food and Human Security in a Warming Planet, 15-17 February, 2010, MSSRF, Chennai, India

In memory of Dr. Norman E. Borlaug, this conference is being organized by M.S. Swaminathan Research Foundation (MSSRF) in collaboration with FAO, IFAD, Bioversity International, CBD, DBT, ICAR, ICRISAT, IFPRI, IRRI, WEP, IUCN, UNEP, SDC, ICRAF, Global Crop Diversity Trust, GEF, PPVRF and NBA. It is designed to promote exchange of ideas on the current situation in the implementation of CBD and FAO Treaty and develop a roadmap for ensuring that biodiversity continues to remain an important tool in achieving the goal of a hunger free world. This will be preceded by a one day discussion on the role of fertilizer trees in improving the productivity of

crops and farm animals (February 14, 2009) in arid and semi-arid areas. For more information, visit: http://www.mssrf.org/events_conferences/content_events/february_2010/International%20Conference.pdf

International Conference on Post-harvest Management and Valorization of Agri-horticultural Produce, 19-20 February 2010, NASC Complex, New Delhi, India

When the whole world is reeling under a severe food crisis, India loses a significant quantity of her harvested produce worth approximately Rs. 55,600 crores annually. The conference will deliberate on the various aspects of post harvest losses and stakeholders to minimize it in order to make more per capita food availability without much intervention or increase in production. Hence, the theme and exhibition is organized to review the recent developments in the field. The experts comprising scientists, academia and technocrats as well as professional consultants in the field would actively participate in the seminar and discuss the future prospects of assimilating post harvest management of Agri and Horticulture produce along with process industries. Apart from food security the conference will address the issues related to Nutritional Security and hidden hunger. This will further enlighten the scope for industry as well as discuss the bottlenecks and possibilities of export of finished goods. For more information, visit: http://www.pmfai.org/int_conf_nd_2009/flashnews.htm

Global Conference on Agricultural Research for Development (GCARD), 28-31 March 2010, Montpellier, France

GCARD aims to develop a new global agricultural research system, driven by tangible development outcomes and bringing together all those involved in agriculture research for development. The major objectives are to ensure that agricultural research systems are well integrated with regional and national partners (public, private and civil) and respond to national and sub-regional demands to help ensure development impact.

The GFAR is being given the responsibility to organize a rolling series of Global Conferences on Agricultural Research for Development (GCARDs), every two years, starting in 2009. These would involve regional reviews, electronic consultations and face to face dialogue in each region, and the reform process of the CGIAR. The 2010 GCARD is being held to align diverse stakeholders in agricultural research around a common agenda and develop the linkages required for its delivery. For more details either contact Dr. Mark Holderness, Executive Secretary, GFAR or visit GFAR website: www.egfar.org

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