



# APAARI

## Newsletter

Asia-Pacific Association of Agricultural Research Institutions

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### Editorial

Economy of most of the developing nations in the Asia-Pacific depend to a greater extent on agriculture. Hence, growth in agriculture is key to alleviate poverty and improve the livelihood of resource poor farmers. Beside depleting natural resources, one of the reasons of slow growth is factor productivity decline mainly due to poor ability of farmers to invest more in agriculture. On the contrary, capital investment in agriculture has also declined in many developing countries. Hence, in order to reverse the process, it is necessary to have a paradigm shift in agriculture from current less remunerative practices to those of innovative farming and better income generating options. This would require scientific planning, adoption of new technological options and much needed agricultural diversification. In this context, "Linking Farmers to Market (LFM)" approach appears to be the best recourse currently. Access to information, organizing major stakeholders for establishing partnerships among them, and capacity building of farmers are overarching issues which need to be addressed on priority. Fortunately, expanding internal markets in different countries and globalization of agriculture offer new options provided LFM approach is adopted and necessary technical backstopping for the post-harvest technology (PHT) is provided.

Success of LFM would largely depend on enhanced capacity at the national level for technological advances, new cost effective and resource saving processes that add value to the products, and appropriate knowledge of markets associated with the ability of the farmers to get themselves organized. All these would demand agricultural innovations-both on-farm and off-farm so that producer – consumer chain is strengthened for desired benefits to all concerned. Also LFM would demand greater R&D efforts in agriculture linked to PHT; agricultural diversification around low volume high value crops or products; market intelligence; and ITC for knowledge management and dissemination.

Realizing the importance of LFM, APAARI had organized an Expert Consultation on "Post-harvest Technologies for Ensuring Food Security and Value Addition for Enhanced Income" from 1-3 December 2004 in Bangkok and later convened a Working Group meeting to review the recommendations of the Expert Consultation in order to decide our future course of action for strengthening LFM initiatives in the Asia-Pacific region. Details of main recommendations are provided inside this issue. APAARI is working in partnership with Global Forum on Agricultural Research (GFAR) to develop both regional and global partnership programs (GPP) on LFM so that ultimate beneficiaries are the resource poor farmers of the Asia-Pacific region. APAARI would continue its efforts to work with all stakeholders to strengthen LFM related activities in the region.

**Editors**

## APAARI – a Forum for Regional Issues

As an offshoot of the 10 November 2005 IPGRI-APAARI Roundtable meeting on the implementation of the International Treaty on Plant Genetic Resources on Food and Agriculture (ITPGRFA), APAARI in collaboration with IPGRI facilitated a meeting of the seven Asian Representatives nominated by the Chairs of the FAO Regional Groups for the drafting of the Standard Material Transfer Agreement (SMTA), on 15-16 April 2006 in Royal Princess Hotel, Bangkok, Thailand. Dr. Rashid Anwar from Pakistan is the Chair of the Asian SMTA Contact Group. The meeting provided the Asian Representatives an opportunity to prepare a well coordinated Asian position which they used for negotiation during the 24-28 April 2006 SMTA Contact Group meeting held in Sweden. Based on the feedback from the Asian Group, the output of the meeting was adopted by those countries (Japan, China and South Korea) that were unable to join the Bangkok meeting. Hence, APAARI, in partnership with IPGRI, was pleased to have facilitated the process of arriving at a common understanding to develop SMTA, which would have greater implications on APAARI NARS for dealing with exchange and benefit-sharing of genetic resources in the future. For more details visit <http://www.apaari.org>.



## APAARI Represented in NACA 17<sup>th</sup> Governing Council Meeting

Dr. Jafar Khalghani, Deputy Minister and Head, Agricultural Research and Education Organization (AREO) of Iran, and Dr. Roozitalab, Deputy Head, AREO actively participated and represented APAARI in the 17<sup>th</sup> Governing Council Meeting of the Network of Aquaculture Centers in Asia-Pacific (NACA) held in Tehran from 25 to 28 February 2006. NACA is a member of APAARI on reciprocal basis and is located in Bangkok, Thailand.

During the meeting, Dr. Roozitalab presented a statement on behalf of APAARI reiterating APAARI's continued support to strengthening different Networks, including NACA, established in Asia and the Pacific region. He indicated that APAARI has established in the past several years many commodity and non-commodity Networks in collaboration with the international agricultural research centers active in the region as well as regional and international organizations. He emphasized that the main objectives of these networks are to enhance the NARS capacity and to facilitate their cooperation in achieving food security and alleviating poverty in the region. He extended an invitation to the new Director General of NACA, Prof. Sena De Silva, to attend the APAARI Meeting and GFAR-triennial 2006 Conference which will be held back to back in New Delhi from 6-8 November and 9-11 November, respectively.



## Strengthening Linkages between Farmers' Organizations and Agricultural Research

APAARI participated during the meeting of the International Federation of Agricultural Producers (IFAP) Asian Committee on 15 May 2006, in Seoul, Korea, which was part of the 37<sup>th</sup> World Farmers Congress and 60<sup>th</sup> Anniversary Celebration of IFAP. Dr. Betty del Rosario, APAARI Assistant Executive Secretary, presented a paper that outlined the mechanisms and APAARI activities where the Civil Society (CSOs) such as the NGOs and farmer organizations can participate actively so that the needs of farmers can be very well articulated and addressed accordingly by the research community. She informed the group that APAARI has extended membership to regional fora/associations on a reciprocal basis. It strives to involve all stakeholders, including CSOs, in its programs and activities. A number of NGOs and farmer representatives have taken active part in APAARI meetings. Efforts are intensified to have continued partnership of representative organizations from the region, having established legitimacy of the constituencies involved in agricultural research for development.

These mechanisms and activities include a more formal linkage such as through membership in APAARI, regional priority setting, identification and formulation of regional collaborative program on thematic areas critical to small-hold agriculture in the region, documentation and dissemination of best practices (also known as success stories) for wider promotion and adoption of technological, institutional and social innovations, and networking for information, experience, and knowledge exchange.

Dr. David King, IFAP Secretary General, welcomed the proposed mechanisms and activities presented and indicated that IFAP shall support the participation of its Asian representatives in these activities. Regarding membership to APAARI, the IFAP Asian Committee under its newly elected Chair Mr. K.P. Singh of the National Institute of Agriculture, India, shall look into the matter. Dr. King mentioned that IFAP will soon finalize its four-year Strategic Plan which will include, among others, raising the status of IFAP in the region and strengthening linkage with research, creating an Asian desk in IFAP Headquarters in Paris and a Liaison desk in the region to build the network and coordinate regional activities.

During the Opening of the IFAP Congress on 17 May 2006, some new developments which are of relevance to APAARI were mentioned by Dr. Lennart Bage, President, International Fund for Agricultural Development (IFAD) during his key note address. These include, among others, the institutionalization of the 2005 Farmers Forum organized by IFAD using bottom-up approach. He mentioned that in 2007, twenty national level consultations will be conducted and before 2008, four regional/sub-regional consultations are planned to develop IFAD's priority areas.

Both APAARI and IFAP believe that the active engagement of the Regional Farmers Network in APAARI activities and vice-versa can contribute to more meaningful partnerships in ARD, with the farmers being the primary beneficiaries of APAARI's efforts.

## Development and Adoption of BMPs by Self-Help Farmer Groups

For farmers, and users and gatherers of aquatic resources, being organized into a formal association or a self-help group is to collectively achieve a strong capacity to enter and stay in aquaculture, effectively demand and absorb institutional services and technical assistance, cope with natural hazards and economic risks, address barriers to property and financial access, and acquire and effectively use capital and operating assets.

These are some hard evidence of the advantages of small farmers being organized, sharing resources, helping each other and adopting better management practices or BMPs, from NACA-assisted projects, in India and Vietnam:

**Case No. 1.** The small shrimp farmers in India are, like other shrimp farmers in the region, repeatedly hard hit by virus diseases. They are the most vulnerable to shocks and least able to rebound from adversities. Yet, other than providing 70 percent of the total volume of exported shrimp, they also comprise more than 80 percent of the shrimp farmers in India. This led to MPEDA requesting NACA assistance in developing and providing technical assistance to a shrimp health management project.

The shrimp health management project developed best health management practices (BMPs) for small farmers that are organized into "aquaclubs" (a group of 15-20 farmers). Initially piloted by volunteer farmers, it eventually evolved into a community development project which resulted in 2005 to increased yield by two-fold, 34 percent increase in shrimp size, and 65 percent reduction in disease prevalence compared to surrounding non-adopting ponds. There was a remarkable improvement in the quality of the shrimps due to non-use of drugs and banned chemicals and the adoption of better harvest and post-harvest handling practices. It also resulted to a contract seed production system that allows the organized small farmers to procure high quality seeds at reasonable price by entering into a contract with hatcheries for batch supplies of certified healthy seed, even offering premium price to hatchery owners for quality and reliable seed supply.

The success of this project led to other positive developments including the provision of financial assistance by MPEDA to 25 aquaculture societies nationwide that register with MPEDA and adopt the prescribed code of practices. The assistance will be for various items including infrastructure development, hiring of technicians, capacity building of members, and promotion of environment friendly farming methods. NACA-MPEDA-ICAR jointly trained a team of young Indian technicians who will be assisted by a marketing expert and a Thai farmer who shall occasionally provide field advice. The National Center for Sustainable Aquaculture is planned to institutionalize the BMP scheme.

**Case No. 2.** Vietnam witnessed an outstanding 3-fold increase in aquaculture production, from 374,000 mt in 1993 to 1,150,000 mt in 2003, and a 2-fold increase only in the 5-year period 1998-2003. Shrimp farming played a major role in this rapid development, with a production that, according to FAO data, over the 5 year period between 1998 and 2003 registered a 4-fold increase reaching over 220,000 mt and that, according to national statistics, grew constantly to reach an estimated 350,000 mt in 2005. This sharp

increase in production came at a cost. Escalating environmental deterioration and the associated shrimp health problems, which in 2004 led to an estimated loss of more than 11 percent of the total shrimp production, began to damage the sector. Farmers usually dealt with these health problems by increasing the use of chemicals, involving sometimes the application of banned substances, which led importing countries to impose restrictions on Vietnamese aquaculture products that in turn most likely resulted in a negative impact on the livelihoods of farming communities.

The government of Vietnam recognized the need for promoting a more sustainable development of the sector and initiated several activities in this direction. For instance, a project on coastal aquaculture promoted responsible development of the shrimp farming sector at all levels and for all links in the production chain. BMPs were developed for broodstock traders, hatcheries, seed traders and farmers. The focus was on simple and practical BMPs, which addressed the needs of resource-poor small-scale farmers. Ten sets of extension material were developed and disseminated in close collaboration with the Ministry of Fisheries. The tangible outcomes include the following (MOFI/NACA, 2005): (a) Implementation of BMP for hatcheries was supported in six hatcheries and resulted in seed production up to 1.5 times higher and a price per unit seed of about 30-40 percent higher than non-BMP seed; (b) There was remarkably lower risk of mortality, higher production and higher probability of making a profit in seven pilot farming communities (655 direct beneficiaries); (c) Farming communes that introduced seed testing increased their chances of making a profit of over 7 times; (d) Average yields were sometimes more than 4 times higher in BMP adopters compared with non-adopters; (e) Incorporation of BMPs into the draft standards for the production of organic seed; (f) Institutional strengthening in the areas of seed screening and certification; and (g) Engendering social harmony among the players in the market chain (hatchery owners, farmers, processors/exporters).

For more details on the above cases, visit [www.enaca.org](http://www.enaca.org).

*\*Source: Pedro B. Bueno, NACA Director General. 2005.*

## Dr. J.L. Karihaloo Joins APCoAB



Dr. J.L. Karihaloo joined as APCoAB Coordinator on 1<sup>st</sup> February 2006 on deputation from Indian Council of Agricultural Research. Dr. Karihaloo has more than 36 years of research and teaching experience in plant genetics, biotechnology and biodiversity. Before joining APCoAB, he was Project Director, National Research Center on DNA Fingerprinting and Officiating Director, National Bureau of Plant Genetic Resources, New Delhi. Dr. Karihaloo has served as a member of several Advisory Committees of ministries responsible for research, development and management of biotechnology and biodiversity.

## NACA Governing Council Endorses Work Program Focused on Farmers, Elects Sena De Silva as Next Director General

The NACA Governing Council, at its 17<sup>th</sup> Meeting, held in Tehran on 25-28 February 2006 has approved the new work program for regional aquaculture development and elected the next Director General (DG), Prof. Sena De Silva, a Sri Lanka-born Australian national, currently with Australia's Deakin University's School of Ecology and Environment. The theme of the work program, which the new DG will implement, is "Aquaculture for Rural Development Focused on the Farmer." It emphasizes more farmer participation and active involvement in policy and program development, and capacity building for voluntary and self-management to complement regulatory measures to manage the aquaculture sector. The tenure of the DG coincides with the work program period, which is now the fourth since NACA's independence in 1990.

Prof. De Silva has had a significant substantive association with NACA, dating back to 1989 when he represented the IDRC at the meeting in Bangkok, and when the Provisional Governing Council adopted the NACA Agreement to become a regional autonomous inter-governmental organization. Subsequently, he had been working in conjunction with NACA management and scientists in the development and execution of several collaborative projects.

Prof. De Silva has been Professor of Aquaculture and Fisheries Management, since 1991, at the School of Ecology & Environment



Prof. Sena De Silva (right) being interviewed after having been elected NACA Director General. NACA Governing Council Chair Mr. Ebrahim Maygoli of Iran (left) looks on.

of Deakin University in Victoria, Australia. He has excellent academic credentials and is a recipient of various prestigious awards from national and international academic and scientific organizations. In May 2005, he was awarded Honorary Life Membership of the World aquaculture Society. He was founding and continuing member of the Asian Fisheries Society since August 1983; and member of other aquaculture and fisheries societies worldwide. He was involved in various aquaculture and inland fisheries development related projects in many countries for various international donor/government agencies such as: Overseas Development Agency, UK (now DFID), IDRC, Swedish Agency for Research Cooperation, Organization for Tropical Research of the Netherlands, International Foundation for Science, AUSAID, ACIAR, APEC, the State Government of Sarawak, Malaysia, the Ministry of Water Resources and Conservation, China and other national research funding agencies.

Prof. De Silva will assume his post on 1 August 2006. He will succeed the current Director General, Pedro B. Bueno, who has been appointed by NACA Governing Council as adviser to NACA on inter-regional cooperation and linkages, tsunami rehabilitation, the technical advisory arm and the STREAM Initiative.

\*Source: Pedro B. Bueno, NACA Director General. 2005.

## Bringing Farmers' Products Closer to the Markets: The Subak Approach

In the highlands of Bali, about 1,200 m ASL, particularly in Bangli and Flores, Arabica coffee is grown mainly for export (beans) to the U.S. and Japan. The government provides funds to Subak, a local farmers' organization which empowers the farmers to work collectively to achieve economies of scale, be more productive and cost effective, fosters quality management to achieve high quality of products required by the market, enhance farmers' income and welfare and sustain agribusiness for the future. Subak adopts the basic Balinese philosophy for maintaining the integrity of natural resources managed sustainably in order to achieve welfare for all.

In Belantih village, Kintamani district, regent of Bangli, Bali province, a Subak named Kerta Waringin (Mabi) has about 41 members. During the last three years, the bean quality and quantity of its members have improved from 21 tons to 40 tons due to the interventions of key players such as the private sector exporter who provided processing equipment and good incentive in terms of premium price (73 percent increase for high quality beans). The Central Coffee and Cacao Research Center in Jember, East Java provided technical and management support to coffee agribusiness (good farming practices, good post-harvest practices, and good manufacturing practices), and linked the Subak to the markets

through joint partnership with two coffee companies, namely, PT. Tri Agung Mulia (TAM) and PT. Indocafe Lampung. In future, this Subak plans to go into value addition by producing good powder Arabica coffee and down stream products and selling them throughout the world. Efforts are geared towards organic certification with assistance from CIRAD, an advanced research and development institution in France. Farmers' income also increased through adoption of technologies such as cattle integration and use of manure to improve soil fertility, and utilization of coffee husks and grass as cattle feed. These technologies are provided by government through the Coffee and Cacao Research Center.

The Subak is believed to be a good start to encourage farmers to work together. Consistent with the government policy to reorient agriculture from production to a market-oriented one, this model has also been replicated in other Arabica coffee-growing areas in Indonesia such in Ngada, Flores Island, and is now progressing well. A more detailed write-up is given in [www.apaari.org](http://www.apaari.org).

\*Source: Dr. Nyoman Oka Tridjaja, Director of Processing and Marketing of Horticulture Product, Ministry of Agriculture, Indonesia.

## Breaking into Distant Institutional Vegetable Markets through Marketing Cluster and Application of Cold Chain System



Harvesting of lettuce in one of the members of the marketing cluster, the field of Bukidnon, Southern Philippines

Philippines small scale growers started out producing vegetables such as lettuce, carrots and garden pea for sale to local traders in Cagayan De Oro City, about 75 km away from the farms. Green Haven Farm began growing lettuce in 1999 producing only 100 kg per week, incurring post-harvest losses and selling the lettuce to local traders at low prices. Later on, it established market linkage with a vegetable processor that supplies minimally processed lettuce to the big fast-food chains in Manila, namely, MacDonald, Wendy's and Pizza Hut. The challenge of timely delivering the required 3.5 tons of lettuce weekly and meeting high quality standard were resolved by organizing

This case study illustrates how vegetable growers can work together to break into high end institutional markets, namely, fresh produce processors, hotels and fast-food restaurants, and the supermarkets.

In the highland province of

Bukidnon, Southern

a marketing cluster composed of five growers, application of cold chain technology combined with sea transport to preserve lettuce quality and, at the same time, bring down transport cost.

In addition, the processor provided technical advice to the grower (who shared them with the cluster) on improved production protocols and good post-harvest handling practices. In order to further improve the lettuce supply chain, the Department of Agriculture's Bureau of Post-harvest Research and



Lettuce in plastic crates being loaded in the refrigerated truck

Extension (BPRE) in partnership with other government agencies provided technical assistance as well as facility support in terms of soft loan package to the lettuce cluster. A ten-foot refrigerated truck, a 20-foot reefer van, and a pre-cooler, comprised the equipment loan package.

The success the marketing cluster of five lettuce growers had achieved so far can be attributed to the close collaboration among the vegetable industry association in the area,



Lettuce packed in plastic crates ready for loading in a refrigerated truck

Continued on page 6 ➤

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

APAARI and GFAR had jointly convened a planning workshop on 6-7 June 2006, of an *Ad Hoc* Working Group (RWG) for the preparation of Asia-Pacific's participation in a Global Partnership Program (GPP) on Linking Farmers to Markets (LFM). The workshop participants included representatives from the NARS, advanced research institutions, private sector, farmers' organization, academe, NGOs, and regional financing and development institutions. The RWG achieved greater definition of what the partnership program on "linking farmers to markets" will look like and defined initial commitments from a number of important stakeholders. The LFM program envisions "enhanced livelihoods of rural households and farming communities by providing opportunities of choice for market integration through responsive R & D". The RWG agreed on the four components of



Participants of the Regional Ad Hoc Working Group Meeting  
6-7 June 2006, Rama Gardens Hotel, Bangkok

the LFM program: information (and documentation), cluster and linkages, responsive R&D, and training. The following initial commitments were expressed and acknowledged: Farmer group training (APRACA); NGO training (FAO); Information and documentation (APAARI, FAO); Research responsiveness (BPRE-Philippines and CFTRI-India); JIRCAS – dispatch of experts on market analysis; Private sector (Nuhem Seeds) – Research

to deliver products); and CLT/FFF/IFAP as partners in the long term. The specific details have yet to be formulated by the coordinators to be designated in time for the September 11-15, 2006 inter-regional meeting in Cairo, Egypt, to be convened by GFAR. GFAR shall consolidate the regional outputs into a Global Partnership Program on Linking Farmers to Market which is expected to take off in 2007.

## APCoAB Fifth Steering Committee Meeting Held

The fifth Steering Committee Meeting of Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) was held on 5<sup>th</sup> June 2006 at Rama Gardens Hotel, Bangkok. The meeting was chaired by Prof. H.P.M. Gunasena, Chairman, APAARI and attended by ten Steering Committee members and special invitees.

During the discussion following the presentation of Action Taken Report and Progress Report, the participants appreciated the overall progress made by APCoAB. Views expressed and recommendations made mainly related to the following aspects:

- 1) There was consensus that the publication on status of Bt Cotton in India had presented a balanced report of the impact of Bt Cotton technology in India. The title of the publication had also been appropriately kept as "Status Report" since it indicated the per se neutral position of APCoAB with respect to GM technology. However, the analysis of various studies did lead to the conclusion that the technology has resulted in significantly reduced bollworm infestation and higher cotton yields, which has been appropriately projected. It was recommended that a 1-2 page summary of the Status Report should be circulated for wider distribution and general public awareness, in association with ISAAA.
- 2) Need was expressed for bringing out more status reports/ success stories of relevance to the Asia-Pacific region. The preparation of status report on Bt Cotton in China needs to be followed up. The success story on date palm micropropagation in Iran should become available very soon, as promised by Dr. Ghareyazie.
- 3) APCoAB needs to develop information on emerging issues like food safety, labeling and public acceptance of GM crops.
- 4) Suggestions were made regarding the proposed Workshop on Biosafety Regulations. It was recommended that since the workshop would be one of the many efforts required

- 5) Syngenta Foundation should be approached for funding support to the proposed training program on Marker Aided Selection, as was suggested by Dr. Andrew Bennett during the High Level Policy Dialogue in November last year.
- 6) Besides conducting activities within the Asia-Pacific region, APCoAB should also pay attention to developing inter-regional linkages, in order to see if a GPP on biotechnology could be established under the umbrella of GFAR with needed funding support.
- 7) Funds need to be raised from different sources to meet the core budget requirements as well as for its expanding activities. Activity sheet with required funding for each activity may be attached with these proceedings in order to have a clear picture regarding resource requirements.
- 8) In addition to the expected funding support from APAARI, ACIAR, Monsanto, MAHYCO and Rockefeller Foundation, organizations/donors such as Asian Development Bank, French Ministry of External Affairs, CIDA, Islamic Development Bank, USAID, JIRCAS, Global Crop Diversity Trust, IDRC etc. should be approached for support.
- 9) GFAR should be approached for contribution of \$ 30,000, on par with others, for 2006. The Chairman, APAARI may flag this issue for discussion in the forthcoming Steering Committee meeting of GFAR to be held in Sana'a, Yemen in the last week of June, 2006.

## GFAR Steering Committee Meeting and AARINENA General Conference Held in Yemen

Prof. H.P.M. Gunasena, Chairman and Dr. Raj Paroda, Executive Secretary, APAARI attended the GFAR Steering Committee meeting as well as AARINENA General Conference from 23-27 June 2006 in Sana'a Yemen. A status report of APAARI's activities was presented by Prof. Gunasena in the GFAR Steering Committee Meeting, whereas Dr. Paroda made a presentation on Inter-Regional Collaboration in the AARINENA General Conference. Both presentations were well received and participants were impressed by multifarious activities to strengthen partnership for agricultural research both within the region and at inter-regional level. One of the highlights of the GFAR Steering Committee meeting is the inclusion of the Civil Society groups (CSOs) in the decision making of the regional fora. APAARI is in the process of consulting its members regarding amendment in its Constitution providing a seat each for the CGIAR, GFAR and the CSO representative.

### *From page 5 Breaking into Distant ...*

local government units (LGUs), logistics service providers, research institutions, NGOs, and the processor-buyer within a policy environment that supports the development of high value crops. This working model of linking farmers to market provided an impetus for other independent, small lettuce growers to join in the marketing cluster. And this development had given the marketing cluster a window of opportunity to expand its production volume and, in turn, its captive institutional market. For details visit <http://www.apaari.org>.

*\*Source: Dr. Rosendo Rapudas, Director, Post-Harvest System Analysis and Development Department, Bureau of Post-Harvest Research and Extension (BPRE), CLSU Compound, Science City of Munoz 3120, Nueva Ecija, Philippines.*



## Indian Council of Agricultural Research (ICAR) A Profile

In India, agriculture is the largest private enterprise sustaining livelihood of about two-thirds of the billion plus population and contributing nearly 21 percent to the national GDP. The adoption of modern agricultural technologies, particularly during the last four decades, paved the way for the country to move from an era of chronic food shortages to a position of food self-sufficiency, buffer stocks and even food exports. The impact of technology development and adoption is evident in all sectors of agriculture. With reference to 1950, the productivity gains have been nearly 3.3 times in foodgrains, 1.6 times in fruits, 2.1 times in vegetables, 5.6 times in fish and marine products, 1.8 times in milk and 4.8 times in egg production. More than 3,300 improved varieties/hybrids of various crops have been released. The production figure of about 150 million tons of fruits and vegetables has placed India among the leading horticultural producing countries. The estimated milk production of 90 million tons is the highest for any country in the world. Poultry sector has also shown remarkable progress with per capita consumption of eggs rising from 5 in 1951 to 41 in 2003-04. Fisheries sector has grown at a rate of 4.5 percent to the current annual fish production of 6.1 million tons (**Box 1**). In recognition of its significant research contributions, the Indian Council of Agricultural Research (ICAR),

### Box 1. Indian Agriculture – A Perspective

|                               |   |
|-------------------------------|---|
| 16.8%                         | of the world's population & 15% livestock |
| 4.2%                          | of the world's water                      |
| 2.4%                          | of the world's land                       |
| 51%                           | arable land & 135% cropping intensity     |
| 142 m ha                      | cultivated & 55 m ha irrigated            |
| 65%                           | of population engaged in agriculture      |
| Contributes 21%               | to national GDP                           |
| First in Milk                 | 91 mt                                     |
| Second in rice & wheat        | 88 & 72 mt                                |
| Second in fruits & vegetables | 47 & 78 mt                                |
| Fourth in fish                | 6.4 mt                                    |
| Fifth in eggs                 | 41 bn                                     |

### Box 2. The National Agricultural Research System

- 48 Central Research Institutes
- 5 National Bureaus
- 31 National Research Centers
- 12 Project Directorates
- 1 Central Agricultural University
- 40 State Agricultural Universities
- 529 Farm Sciences Centers
- 82 All-India Coordinated Projects
- Other public and private institutions including NGOs



*National Agricultural Science Center: State of the art infrastructure for seminars, conferences etc. It also houses the professional scientific societies, National Academy of Agricultural Sciences, National Agricultural Museum and offices of several CGIAR Institutions*

was awarded the 1988 “King Baudouin Development Prize International” for being the best agricultural institution in the world.

The present National Agricultural Research System (NARS) of India comprises a vast network of agriculture related organizations led by the Indian Council of Agricultural Research (ICAR) (**Box 2**). Historically, the first step towards establishment of an agricultural research system in the country dates back to 1889 when Imperial Bacteriological Laboratory was established at Pune. In 1905, Agricultural Research Institute was established at Pusa, Bihar which

was shifted to Delhi in 1936 and named Indian Agricultural

### Box 3. Mandate, Goal and Vision of the ICAR

#### Mandate

- To plan, undertake, aid, promote and coordinate education, research and its application in agriculture, agro-forestry, animal husbandry, fisheries, home science and allied sciences.
- To act as a clearing-house of research and general information relating to agriculture, animal husbandry, home science and allied sciences, and fisheries matters through its publications and information system, and instituting and promoting transfer of technology program.
- To provide, undertake and promote consultancy services in the field of education, research, training and dissemination of information in agriculture, agro-forestry, animal husbandry, fisheries, home sciences and allied sciences.
- To look into the problems relating to broader areas of rural development concerning agriculture including post-harvest technology, by developing cooperative programs with other organizations, such as the Indian Council of Social Science Research, Council of Scientific and Industrial Research, Bhabha Atomic Research Center, Universities, etc.
- To do other things considered necessary to attain the objects of the Society.

#### Goal

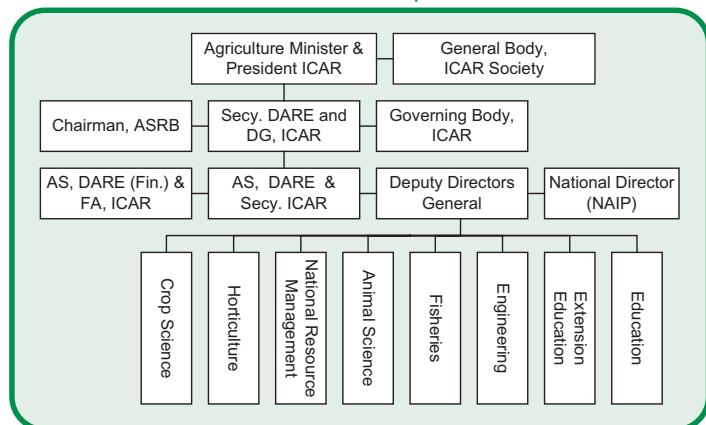
Sustainable growth of Indian agriculture by interfacing education, research, and extension initiatives complimented with efficient and effective institutional, infrastructural and policy support, that will create a proper fit between the humanity and its habitat.

#### Vision

To harness science to ensure comprehensive and sustained physical, economic and ecological access to food and livelihood security to all Indians, through generation, assessment, refinement and adoption of appropriate technologies.

*Continued on page 8*

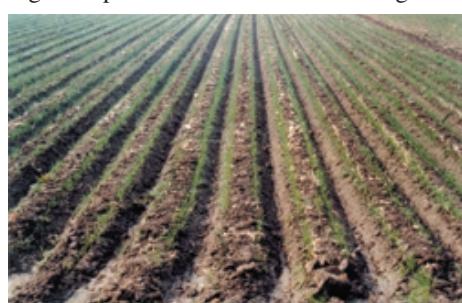
## ICAR at Headquarters



Research Institute. The ICAR has its foundation in Imperial Council of Agricultural Research that was established on 16 July 1929 on the recommendations of Royal Commission Report of 1928. The Director General is the CEO of ICAR, eight Deputy Directors General provide technical support while Secretary, ICAR and Financial Advisor provide administrative and financial support to the Director General.

The ICAR is a registered Society under the Societies Registration Act-1860, but it also functions as the research wing of the Ministry of Agriculture, Government of India performing a variety of functions including development of national research policies and priorities and linking them with the government's development objectives through a network of research institutions. The mandate, goal and the vision of the ICAR are given in **Box 3**.

The ICAR research, teaching and extension activities are conducted by nationwide network of Central Research Institutes, National Research Centers, Project Directorates, National Bureaus and All-India Coordinated Research Projects conduct research. The Central Research Institutes carry out basic and applied research on problems of national importance with some focus on regional problems as well. Realizing the importance of scientific



Zero-till wheat crop on permanent raised beds.

Rice in previous season has been harvested manually.

management of natural resources, five National Bureaus have been established to collect, conserve, evaluate and document soil, plant, animal, fish and microbial resources and initiate such measures as would lead to their

long - term conservation and sustainable utilization. The National Bureau of Plant Genetic Resources has one of the largest gene banks with a capacity to hold over a million seed samples. The



ICAR Headquarters, New Delhi

National Research Centers have the mandate of basic and strategic research on specific agricultural commodities or problem areas. They feed the national research network with new materials, techniques and information for subsequent adoption in the different production oriented research program. All-India Coordinated Research Projects established since 1957 link up the research programs in the ICAR research institutes, the state agricultural universities, and non-governmental institutions in a cooperative framework. Further, Farm Science Centers, *Krishi Vigyan Kendras* (KVK), have been established at the rural district level throughout the country for assessment, refinement and on-farm demonstration of agricultural technologies, and training of trainers and farmers. It is envisioned to have one KVK in each of the 588 rural districts of the country by the end of 2007.

The first **State Agricultural University (SAU)** in India was set up in 1960 at Pantnagar, in Uttarakhand state. Presently there are 39 SAUs and one Central Agricultural University with more than 200 constituent colleges. Developed on the US Land Grant pattern, the SAUs have integrated function of teaching, research and extension. The universities also cater to the agricultural education needs of developing countries by enrolling foreign students at graduate and post graduate levels.

The ICAR has entered into collaborative research programs with the several national organizations on research and development in biotechnology, industry, medicine, atomic energy and space. International collaborations have been established with IARCs, FAO and other UN organizations. The ICAR has signed



Memoranda of Understanding with CIMMYT, IPGRI, IIRR, ICRISAT, IFPRI, ICARDA, ILRI, CIP, IWMI and WFC. Presently, 10 CGIAR institutes have their regional/ sub-regional offices

housed in the National Agricultural Science Complex, in New Delhi. The ICAR has bilateral MOUs with nearly 30 countries, mostly in the developing world.

Continued on page 9

Some new technologies developed by NARS

- Resource conservation technologies adopted in ~2 mha; provide additional 0.5 mt of foodgrains and incremental monetary benefits of about US\$ 133 million per annum.
- Annual Breeder Seed Production – 75000 Q
- True Potato Seed – a low-cost healthy planting material
- Vaccines for Foot and Mouth Disease, Hemorrhagic Septicemia, Sheep Pox
- Diagnostic facilities for exotic diseases (Bovine Viral Disease, Rabbit Hemorrhagic Syndrome, Highly Pathogenic Avian Influenza)
- A simple ELISA kit for detection and typing of Foot and Mouth Disease Virus
- Carp fry production over 19 billion every year
- Animal vaccines: Zero 'rinderpest' achieved, annual savings US\$ 80 mn

**The Road Ahead:** The areas that have been targeted to receive priority attention include:

- i water management;
- ii soil health and productivity potential;
- iii genetic resources;
- iv biotic and abiotic stresses;
- v crop diversification;
- vi post-harvest management;
- vii energy management;
- viii marketing and trade;
- ix knowledge dissemination; and
- x enabling policy environment.

The key components of the strategy to address the concerns would call for a paradigm shift from food and nutrition security to prosperity; self-reliance in cutting-edge technologies; holistic natural resource and energy management; conversion of agricultural waste into useful products and changing by-products into main products; enhancing primary processing, value addition and product diversification; intensify on-farm employment and promotion of off-farm opportunities; improved competitiveness of farm



Zero -till ferti-seed drill

produce to harness trade advantages; regionally differentiated, socially acceptable, economically viable, ecologically sound, production to consumption oriented system-wide approaches and align technologies, services, supplies and policies to technology-led growth.

In keeping with the needs of fast changing global scenario, ICAR is endeavouring to make the Indian agricultural research system

India was the first country to develop hybrids in:

- Cotton
- Pigeon pea
- Castor
- Mango
- Pearl-millet

Second to develop hybrid rice.

forward looking and visible with appropriate agricultural research policies in place supported by cutting-edge technologies. In this endeavor, ICAR as the national nodal organization for agricultural research and education stands committed to achieve a sustainable national food and nutritional security and prosperity through excellence in agricultural research and education. ICAR is an active member of APAARI.



### APCoAB Progress to Date

During 2006, APCoAB brought out a publication entitled "Bt Cotton in India – A Status Report". The report gives details of the events that led to commercialization of Bt Cotton in India, adoption of Bt hybrids in different cotton growing zones, performance of the commercialized hybrids under experimental and farmer managed conditions, and the economic benefits realized from the adoption of Bt technology. Based on the experiences gained, strategies have been suggested for achieving improved pest resistance in cotton and better economic benefits especially to small and marginal farmers. The publication is available at [www.apcoab.org](http://www.apcoab.org). Other publications under compilation are: "Micropropagation of potato", "Micropropagation of sugarcane" and "Biotechnology case studies in the Pacific region".

APCoAB web site has been redesigned rendering it more user friendly. The web site has been reconstituted and it also provides comprehensive links to related web sites. All APCoAB publications are available at this site. Information is being compiled on national biosafety regulations of the Asia-Pacific countries for distribution among biosafety regulators and other stakeholders in the region. Workshop on "Biosafety regulations for transgenic crops and the need for harmonizing them in the Asia-Pacific region" is being organized in International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad from 31 July – 2 August 2006.



### APAARI Publications

#### Recent APAARI Publications

- Proceedings of High Level Policy Dialogue on Biotechnology for Food Security and Poverty Alleviation: Opportunities and Challenges. 7-9 November 2005.
- Bt Cotton in India. A Status Report. 2006. APCoAB. New Delhi, India.

#### Forthcoming APAARI Publications

- Some Success Stories on ICT. 2006.
- Some Success Stories on Linking Farmers to Market. 2006.
- Micro-Propagation of Potato. 2006. (APCoAB).
- Micro-Propagation of Sugarcane. 2006. (APCoAB).
- Biotechnology case studies in the Pacific. 2006. (APCoAB).
- APAARI in Fifteen Years. 2006.

## APAARI Represented in the 28<sup>th</sup> FAO Regional Conference

At the invitation of FAO Regional office, Bangkok, Mr. P.K. Saha, Liaison Officer, attended the 28<sup>th</sup> FAO Regional Conference for Asia and the Pacific which was held in Jakarta, Indonesia, from 15 to 19 May 2006 to represent APAARI. Representatives from 30 member countries participated in the Conference.

The two substantive agenda items discussed were on:

- i Adjustment and Restructuring in Major Asian Economies and their Implication on Food Security and Poverty in the Rest of the Region; and
- ii Reducing Vulnerability to Natural Disasters and Promoting a Livelihood Approach for Rehabilitation and Reconstruction in the Senior Officers Meeting held from 15 to 17 May 2006.

The Ministerial level Conference was held from 18 to 19 May involved the full delegation of all participating countries and organizations, including 15 Ministers and 3 Vice-Ministers responsible for agriculture. Dr. Jacques Diouf, Director-General of FAO, welcomed the President of the Republic of Indonesia and all the participants to the Conference. His Excellency Dr. Susilo Bambang Yudhoyono, President of the Republic of Indonesia, in his Conference inaugural address stressed that greater efforts were needed to overcome the challenges of increasing population, natural disasters, inefficiencies in agricultural production and food distribution, resource degradation and distortions in the international trade regime. Items discussed in the Plenary Session were:

- i General debate on Food and Agriculture situation in the Region;
- ii Report on FAO Activities in the Region with a Focus on the Achievement of the MDGs; and
- iii Report of the Senior Officers Meeting.

Of the 53 main recommendations that emerged out of the Conference, some are relevant to the mission of APAARI, such as:

- i recommendation for increased bilateral and regional cooperation, and enhanced collaboration with international research centers, to facilitate the exchange of knowledge, technologies, skills and genetic resources, including those of coconut trees and pandanas;
- ii urging the member countries to carefully review policies, practices and institutional arrangements to ensure efficient and sustainable conservation and use of forests, land, water and other natural resources, including plant and animal genetic resources, needed to sustain agricultural productivity; and
- iii recommendation for member countries to strengthen agricultural research and development, to increase productivity and market competitiveness of farmers, especially in disadvantaged areas and indigenous communities.

Mr. P.K. Saha availed the opportunity to discuss with the Executives and Senior Officers of NARS and related sectors inviting their institutions to join APAARI as its subscribed members. Discussions were held separately with

- i Director-General of IAARD, Indonesia,
- ii Secretary, Ministry of Agriculture, Bhutan,
- iii Director-General, Department of Agricultural Planning, Ministry of Agriculture, Myanmar,
- iv Secretary-General, National FAO Committee, DPR Korea,
- v Deputy Director-General, Ministry of Agriculture, Beijing, China, and
- vi Director of UN-ESCAP Project CAPSA.

## APAARI Executive Committee Meeting Held

The mid-term APAARI Executive Committee (ExeCom) meeting was held on 5 June 2006 in Rama Gardens Hotel, Bangkok, Thailand. The ExeCom reviewed progress of APAARI activities, Work plan 2006 and discussed the proposed Amendment in the APAARI Constitution pertaining to the membership in the Executive Committee. It approved the work plan which includes, among others:

- i Publication of two success stories – one on “Bt Cotton in India” and the other one either on “Production of Virus-Free Citrus Plants” in Taiwan or “Bt Cotton in China” or tissue culture in date palm or in potato
- ii Publication of “Fifteen Years of Achievements by APAARI”
- iii Inter-Regional RAIS Workshop in the Asia-Pacific Region to be held from 3-4 July at AIT, Thailand
- iv APAARI Regional Synthesis Workshop on Research Needs in



APAARI Executive Committee Members

- Asia and the Pacific, 18-19 August 2006, in Bangkok, Thailand
- v Expert Consultation on Agricultural Innovations: Linking Farmers to Market and the 9<sup>th</sup> General Assembly Meeting of APAARI from 6-8 November 2006 in New Delhi, India.

It noted the active participation of APAARI in important regional and international meetings during the period to strengthen its linkage with other stakeholders such as NACA, FAO, IFAP, GFAR, and AARINENA. It noted the appointment of the new APCoAB Coordinator, Dr. J.L. Karihaloo, effective February 1, 2006, the updating and further improvement of the web site, CD on NARS and progress on ICT Success Story publication. The APAARI Constitution is proposed to be amended to provide for one seat each to GFAR and the CGIAR, subject to approval by the General Assembly in November 2006.

## An Update on Asia-Pacific Agricultural Research Information System (APARIS)

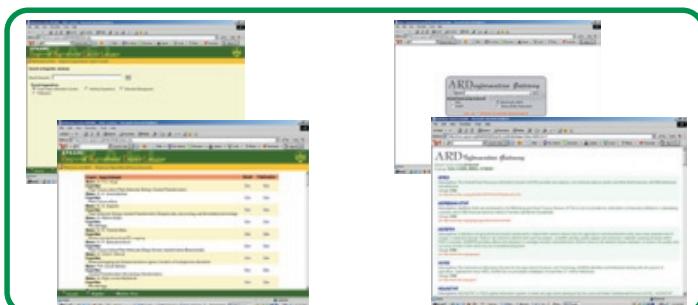


Participants of 2006 Workshop on Advocacy and Inter-regional Cooperation for ICT/M in ARD

APARIS, an ACIAR and GFAR funded initiative of APAARI, has been active since the year 2000, promoting information communication technologies and management (ICT/M) in agricultural research for development (ARD) to support agricultural knowledge management and dissemination in Asia-Pacific region. The thematic areas of APARIS activities include **advocacy**, **capacity building** and **integration of information resources**.

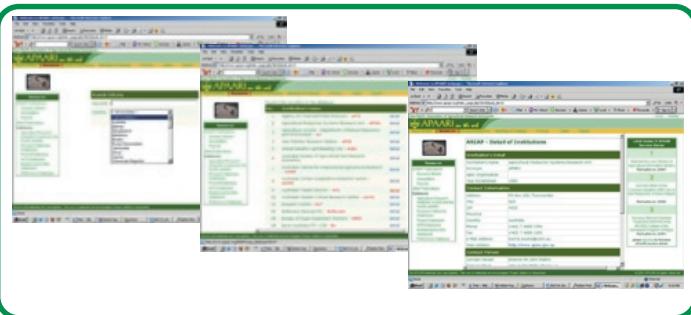
Under these themes, APARIS has conducted three expert consultations, two short-term training programs, and an inter-regional workshop on advocacy for ICT/M in ARD. More than 200 participants from various national, regional and international organizations have taken part in these activities. APARIS training programs have trained national agricultural information officers of 15 NARS of the Asia-Pacific region. APARIS has published the proceedings of the experts consultations, one status report, and is currently publishing "Selected Success Stories on Agricultural Information Systems."

APAARI web site, managed by APARIS, makes available these as well as all other APAARI publications in user-friendly formats. APARIS is also actively involved in annual CD-ROM publications such as "APAARI on CD" and "NARS Directory on CD", targeting users in some developing countries of the region, who lack adequate internet connectivity. Through APAARI web site, APARIS also provides services such as Regional Agricultural Expert Locator (RAEL) and Regional Agricultural Information Gateway (RAIG), and links to web sites of APAARI members, collaborators and diverse stakeholders of ARD.



Screen shots of RAEL and RAIG

Some of the APARIS outputs are shown in the pictures here. The final proceedings of the recently completed workshop on advocacy for ICT/M in ARD will be made available on APAARI web site soon. APARIS also actively participates in other similar forums, including AFITA and APAN.



Screen shots of NARS Directory On-line

### GFAR New Chair Dr. Adel el-Beltagy



Dr. Adel el-Beltagy, the New Chair of GFAR, takes over the mantle of leading GFAR over the next three years from June 1<sup>st</sup> 2006 .

Dr. el-Beltagy obtained a PhD from the University of Wales, UK specializing in stress physiology and worked extensively in the area of arid land agriculture.

He was for many years (1995-2006) the Director General of the International Center for Agricultural Research in the Dry Areas (ICARDA) and prior to that held various positions of responsibility in the Egyptian NARS including the establishment of the Arid Land Agriculture Laboratory at Ain Shams University in 1981 and as Director General of the Agricultural Research Center in Cairo, Egypt (1991-1993). He also contributed in many ways to the establishment of the National Agricultural Genetic Engineering Laboratory (NAGEL) in 1990.

He brings to GFAR, this unique combination of a solid and practical researcher, a NARS leader and leader of an International Agricultural Research Center. His experience, expertise and network connections will be very much valued by the GFAR family.

Source: O. Smith. GFAR Newsletter. April 2006.

## APAARI Members

### MEMBERS

- ACIAR-Australian Center for International Agricultural Research (Australia)
- AREO-Agricultural Research and Education Organization (Iran)
- BAR-Bureau of Agricultural Research (Philippines)
- BARC-Bangladesh Agricultural Research Council (Bangladesh)
- CARP-Sri Lanka Council for Agricultural Research Policy (Sri Lanka)
- COA-Council of Agriculture (Chinese Taipei)
- DOA-Department of Agriculture (Thailand)
- IAC-Institut Agronomique Neo-Caledonien (New Caledonia)
- ICAR-Indian Council of Agricultural Research (India)
- JIRCAS-Japan International Research Center for Agricultural Sciences (Japan)
- MAFF-Koroniva Research Station, Ministry of Agriculture, Forestry and Fishery (Fiji)
- MARD-Ministry of Agriculture and Rural Development (Vietnam)
- MARDI-Malaysian Agricultural Research and Development Institute (Malaysia)
- MCFF-Ministry of Commerce, Forests and Fisheries (Western Samoa)
- NARC-Nepal Agricultural Research Council (Nepal)
- NARI-National Agricultural Research Institute (Papua New Guinea)
- PARC-Pakistan Agricultural Research Council (Pakistan)
- PCARRD-Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (Philippines)
- PNG UniTech – Papua New Guinea University of Technology (Papua New Guinea)
- RDA-Rural Development Administration (Republic of Korea)

### ASSOCIATE MEMBERS

- AVRDC-World Vegetable Center (Chinese Taipei)
- CIMMYT-International Maize and Wheat Improvement Center (Mexico)
- ICARDA-International Center for Agricultural Research in the Dry Areas (Syria)
- ICBA-International Center for Biosaline Agriculture (United Arab Emirates)
- ICIMOD-International Center for Integrated Mountain Development (Nepal)
- ICRISAT-International Crops Research Institute for the Semi-Arid Tropics (India)
- IFPRI-International Food Policy Research Institute (U.S.A.)
- ILRI-International Livestock Research Institute (Kenya)
- IPGRI-International Plant Genetic Resources Institute (Italy)
- IRRI-International Rice Research Institute (Philippines)
- IWMI-International Water Management Institute (Sri Lanka)
- UNESCAP-CAPSA-Center for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (Indonesia)
- The World Fish Center (Malaysia)

### RECIPROCAL MEMBERS

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

## Upcoming Meetings and Conferences

APAARI will host a two-day **Inter-regional Workshop for Developing a Common Regional Fora Strategy under a Global Framework of ARD Information Systems** on 3-4 July 2006 in **AIT, Bangkok Thailand**, in collaboration with GFAR. The workshop will provide an opportunity for inter-regional expertise sharing and joint development of tools/application for NAIS-RAIS networking.

A **Regional Workshop for the Synthesis of Research Needs in Asia-Pacific region** will be held on 18-19 August 2006 in Rama Gardens Hotel, Bangkok, Thailand with the aim of: (1) synthesizing regional research needs and identifying commonalities among sub-regions, and (2) identifying regional priority collaborative research and development programs and specifying the role of different stakeholders. This is consistent with the aim of both APAARI and GFAR to broaden partnership both the regional and global levels. In order to have a meaningful outcome, pre-workshop on-line interaction with key stakeholders in the region (NARS, CGIAR, NGOs, FOs, and private sector) will be ensured.

Under INCANA, an Inter-Regional Network on Cotton, an **IPM Traveling Workshop in Syria** is proposed to take place during 16-21 August 2006. The IPM experts from cotton growing member countries of the network will participate. From Asia-Pacific region, APAARI would sponsor participation of one expert each from India and Pakistan.

GFAR will convene an **inter-regional meeting on Global Partnership Program on Linking Farmers to Market (GPP-LFM)** on 11-15 September 2006 in Cairo, Egypt. The different regional fora have conducted regional working group meetings to prepare the regions to participate in the GPP on LFM. The results will be presented and discussed during the Cairo meeting.

The **APARIS Steering Committee** will be having its meeting during the APAARI General Assembly on 6-8 November 2006 in New Delhi, India. It will conduct a workshop on Rael and RAIG and discuss outcomes of the Inter-regional workshop for Developing a Common Strategy under a Global Framework of ARD Information Systems.

The **ICAR, India** will host the following international meetings: **2<sup>nd</sup> International Rice Congress-2006**, October 9-13, 2006, New Delhi, India. View details on [www.irri.org/irc2006](http://www.irri.org/irc2006); [www.icar.org.in](http://www.icar.org.in)

**APAARI General Assembly and Expert Consultation on "Agricultural Innovations: Linking Farmers to Market" 6-8 November 2006.** New Delhi, India. View details on [www.apaari.org](http://www.apaari.org)

**GFAR Triennial Conference 2006:** "Reorienting Agricultural Research to meet the Millennium Development Goals" 9-11<sup>th</sup> November 2006, New Delhi, India. View details on [www.egfar.org/gfar2006](http://www.egfar.org/gfar2006).

All queries relating to APAARI Newsletter be addressed to:

**APAARI Secretariat**  
**Maliwan Mansion, 39 Phra Atit Road**  
**Bangkok 10200, THAILAND**

**Tel: +662-697-4371**  
**Fax: +662-697-4408**  
**e-mail: [apaari@apaari.org](mailto:apaari@apaari.org); <http://www.apaari.org>**