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Editorial Committee

- Dr Raghunath Ghodake
- Ms Mellisa Wood
- Dr Trinh Khac Quang
- Ms Martina Spisiakova
- Dr Bhag Mal

Editorial

APAARI Charts Pathways to Strengthen Agri-food Research and Innovation Systems

Recently APAARI, its partners and key stakeholders have designed APAARI Strategic Plan 2017-2022. Based on the framework provided by the APAARI Vision 2030, the Strategic Plan provides the key pathways to strengthen agri-food research and innovation systems (AFRIS), in order to develop agri-food systems (AFS) and to bring about sustainable agricultural development in Asia and the Pacific. This development is considered fundamental in the post-2015 development agenda and in realization of the sustainable development goals by 2030 in the Asia-Pacific Region.

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Expert Consultation on Best Practices in Agri-food Innovations in Asia and the Pacific

The Expert Consultation on Best Practices in Agri-Food Innovations was organized jointly by the Asia-Pacific Association of Agricultural Research Institutions (APAARI); the Council of Agriculture (COA), Taiwan; Australian Centre for International Agricultural Research (ACIAR); the World Vegetable Center (AVRDC), Taiwan;



Participants of Expert Consultation, Taichung, Taiwan

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and the Asian Farmers Association (AFA), the Philippines at Taichung, Taiwan on 1-3, November, 2016 and was attended by 87 participants from 14 countries including researchers, policy makers, innovative farmers and representatives of NARIs, NAROs Higher Education Institutions, the private sector, CSOs (NGOs, FOs), women and youth representatives, CG Centers, and International Agricultural Research Centres. The programme was planned in six technical sessions besides inaugural and concluding sessions and provided a platform to have discussions and develop a road map to catalyze policy/decision makers and sensitize stakeholders in agri-food research and innovations and to embrace successful agri-food innovations for upscaling and outscaling in Asia and the Pacific.

On 2 November 2016 a field trip to the genebank and demonstration garden of the World Vegetable Center and the Taiwan Orchid Plantation was carried out.



Participants visiting the World Vegetable Center (AVRDC)

Major Recommendations

- There is an urgent need for innovation platforms in order to share knowledge between the various actors.
- There is a need to develop good agricultural practices which will address pesticide residue and food safety concerns.
- There is a need to develop a road map, platform and document innovative partnerships.
- Incubation centres should be developed for adoption of good agricultural practices and to promote and upscale local agri-food innovations in public-private partnership mode.
- Market intelligence should be ensured to strategize production and marketing, and to develop database on agri-food market chains and post-harvest losses.
- There is a strong need for participation of cooperative societies, NGOs in technology dissemination and to have fair distribution of profits among all actors in the value chain.
- The capacity in agri-food innovations area will need to be built individually to work collectively, must be specific to the time and there should not be any risk to farmers.
- Capacity development for innovation should be based on a long-term strategy with plans covering individual, and organizational innovation capacity.
- There is a need for political support in capacity building for sustainable and new concepts and institutional innovations and skill development.
- There is greater need for the collection, documentation, maintenance, application of information related to all processes in the supply chain.
- Concerted efforts are needed to develop public-private partnership to catalyze private investment in scaling-up of agri-food innovations through development of business models.
- Special efforts need to be made on the process of developing the strategy which should be open, specific to the time, adaptive and to evolve over time.
- Greater thrust needs to be given on development of new technologies to help improve the productivity of farming systems while decreasing their impact on the environment, and minimizing postharvest and storage losses.
- There is a need for ICT led agriculture, train farmers in agricultural extension, biosafety and quarantine, conservation and profiling of indigenous breeds, strengthening local institutions and the capacity to maintain and use biodiversity.
- Concerted efforts are required for collection, customization, and dissemination of innovative knowledge and information in order to convert personal knowledge into organizational knowledge and corporate information.
- Focused attention is required in managing the knowledge on technical innovations in production process, postharvest handling, product processing, reduction of greenhouse gas emissions, climate change, and non-technical innovations.
- There is an urgent need for more innovations for technology management, by establishing industry clusters, strengthening agribusiness assistance, enhancing agro-tech marketing and finance and training human resources.
- Concerted efforts are needed to organize a series of workshops including skills for partnering and engagement, monitoring evaluation and learning tools.
- To promote long-term growth and the jobs of tomorrow, governments must ensure that framework conditions, institutions and policies facilitate business investment in knowledge-based capitals.
- There is urgent need for policy of agricultural transformation to revitalize rural community and to increase rural income by encouraging collective actions of multi-sectoral stakeholders.
- The poor and less privileged in the country should not be neglected. There should be fair treatment and equal opportunities for all the people and a national policy should be in place to address all these issues.
- Special efforts need to be made on facilitating cooperation, networking activities and partnerships among different innovation actors working in the same field to achieve synergies and technology transfers.
- Focused attention is needed to provide the necessary financial services and training that will help farmers increase their crop yields, improve income and food security.
- Concerted efforts are needed to develop indicators and tools to evaluate the performance of agricultural innovation systems, and innovation policy regularly.
- APAARI should play a major role in sharing knowledge of agri-food innovations across countries in the region.

- There is an urgent need to share database between public and private organizations for upscaling and outscaling the technologies in a public-private-partnership mode.



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Editorial

The Strategic Plan directs and guides APAARI, its partners and others to focus on four main themes: i) mobilization, management and use of natural resources for sustainability; ii) management of risks and uncertainties; iii) inclusive development and integration of value chains targeted at benefiting smallholders; and iv) analysis, strengthening and formulation of public policies and overarching regulatory frameworks in support of the transformation and development of AFS.

The implementation focus areas of APAARI, termed as APAARI programmes are: i) knowledge management, ii) partnership and networking, iii) capacity building, and iv) advocacy, and two cross-cutting areas of i) women and youth and ii) foresight and visioning. Each of these programmes and cross-cutting areas are adequately enriched with key strategies, specific strategies and indicative activities which show articulated and prioritized pathways, as both guidance and direction, in strengthening agri-food research and innovations systems in Asia and the Pacific.

The Strategic Plan is ambitious in its strategies, actions and deliverables through development outcomes and these give rise to a number of implications to reform APAARI in terms of its governance and development. The key implications are:

- Enhanced/proactive partnership among APAARI members, partners, and stakeholders;
- A platform based on ownership and self-commitment and a mechanism to catalyse change;
- APAARI to be a more diverse multi-stakeholder platform, with membership not only of research organizations but many others such as CSOs (NGOs/FOs), higher education, extension, policy makers, the private sector, development organizations, national, sub-regional and regional governments, etc.;
- The platform to be equitable with inclusivity for key actors involved in agri-food systems;
- Transformative and speedy improvements, especially strengthening human and financial resources;
- A step-wise transformative process in progressive manner, and to be consistent with structure of APAARI;
- APAARI constitutional reform will be required to enable effective changes.

The above implications and changes will require APAARI reform to be systematically assessed, planned and advanced. Successful implementation of the Strategic Plan will depend on effective partnership and cooperation between APAARI, agri-food research and innovation organizations, and primary stakeholders as identified in the Strategic Plan. Therefore, it will also be paramount to do the necessary ground-work through canvassing and advocacy to solicit commitments by members, partners and primary stakeholders.

In successfully developing the Strategic Plan 2017-2022 and charting the pathways, APAARI has realized a watershed accomplishment in strategically addressing the post-2015 development agenda towards 2030. If the Strategic Plan is implemented with sincerity, conviction and rigor, APAARI will prove to be a successful platform of its kind in addressing and contributing to the 2030 development agenda in Asia and the Pacific.



APAARI 14th General Assembly Meeting (GAM)

The 14th General Assembly Meeting (GAM) of APAARI was hosted by the Council of Agriculture (COA) and held at the Hotel National, in Taichung, Taiwan on 3 November 2016. Forty six members, partners, special invitees and APAARI staff and consultants participated in the meeting.



Participants of 14th APAARI General Assembly Meeting, Taiwan

The key decisions taken by the meeting, which have far reaching progressing implications for the growth and accomplishments of APAARI, are presented below:

- The audit report and the audited financial statements for the years 2014 and 2015 were endorsed. Also endorsed was the audit report and financial statements for the interim period January – September 2016.
- Advanced and refined version of the “APAARI Strategic Plan 2017-2022: Pathways to strengthened agri-food research and innovations in Asia and the Pacific” was unanimously endorsed after systematic deliberation and enriched consultations.
- By considering implications arising of the Strategic Plan, the APAARI Executive Committee and the APAARI Secretariat have been directed to work and progress on changes necessary in the areas of APAARI governance and development.
- As an immediate implication arising through implementation of the APAARI strategy, an enhanced resource (human and financial) mobilization plan was approved for the biennium 2017-18.
- The necessary change to Article 10 of APAARI constitution on the composition of APAARI Executive Committee was approved, providing for two additional members on the Committee representing: i) the Association of International Research Centers for Development in Agriculture (AIRCA) and ii) the Higher Education Sector (Universities).

New Executive Committee for the Biennium 2017-2018

Chair : PARC, Pakistan
Vice-Chair : NARI, Papua New Guinea
Members : DOA, Thailand
COA, Taiwan
NARC, Nepal
MAF, Western Samoa
World Vegetable Center (AIRCA)
IAUA, India (Higher Education Sector)
Executive Secretary, GFAR
CGIAR (to be nominated by CGIAR Systems Office)
Farmers Associations (to be decided by EC)
NGO (to be decided by EC)
Private Sector (to be decided by EC)

- As an urgency for immediate replacement of Dr Raghunath Ghodake, who would be concluding his assignment effective as of 31 December 2016 due to his ill-health, a decision was made to have an Interim Executive Secretary to manage APAARI programmes/activities.



XIV APARIS Steering Committee Meeting

The XIV Steering Committee (SC) meeting of the APARIS for 2016 was held at the Hotel National, Taichung, Taiwan on 31 October 2016. Dr Raghunath Ghodake, Executive Secretary, APAARI welcomed all the participants. Dr Waraporn Prompoi, Deputy Director General, Department of Agriculture (DOA), Thailand chaired the meeting on behalf of Dr Suwit Chakiattiyos, Director General, DOA, Thailand. Dr Andrew Campbell, Chief Executive Officer, Australian Centre for International Agricultural Research (ACIAR), Australia was the Vice-Chair. Dr S.G. Abbas, Consultant represented APARIS Coordinator and presented the APARIS Progress report.



APARIS Steering Committee meeting in progress

The Steering Committee considered and discussed all agenda items in order of its schedule. The chairperson showed her satisfaction on the current and the past achievements of APARIS and also work plan for the year 2017. The following main recommendations emerged during the SC Meeting:

- APARIS should under the APAARI Strategic Plan 2017-2022, bring its members, partners and other stakeholders closer together to address priority needs of the agri-food system through strengthening of agri-food research and innovation systems.
- Knowledge Management should become an overarching strategy of APARIS.
- Facebook is getting more popular in the social media thus, APARIS should focus on increasing its number on Facebook.
- Focal Point from the NARS should share information for APAARI and APARIS.
- CEO, ACIAR assured continued support for the APARIS future work plan and activities



XVIII APCoAB Steering Committee Meeting

The XVIII Steering Committee (SC) Meeting of Asia-Pacific Consortium on Agricultural Biotechnology (APCoAB) was held on 31 October 2016 at Hotel National, Taichung, Taiwan. The meeting was attended by 11 participants, comprising SC members, their representatives, special invitees and observers. APAARI Chairman, Dr Suwit Chakiattiyos, Director General (DG), Department of Agriculture, (DOA) Thailand was represented by Dr Waraporn Prompoj, DDG, DOA while Vice-Chair, Dr Chun-yen Chen, DG, International Affairs, Council of Agriculture, (COA) Taiwan was represented by Ms Rose, Dong-chong Hsiou, DDG, Department of International Affairs, COA. Other participants included Dr Reynaldo V. Ebor, Acting Executive Director, Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), Philippines; Prof Andrew Campbell, Chief Executive Officer, Australian Centre for International Agricultural Research (ACIAR), Australia and Dr Raghunath Ghodake, Executive Secretary, APAARI. Dr Jawahir Karihaloo, Sr. Consultant, APAARI representing Coordinator, APCoAB presented a report on background, progress and proposed future programmes of APCoAB. He also introduced the



Participants of APCoAB Steering Committee Meeting, Taichung, Taiwan

outline of proposed extension of APAARI-COA collaborative programme for the period 2017-2020. Prof Andrew Campbell, Dr Waraporn Prompoj and Ms Rose, Dong-chong Hsiou, made important observations/suggestions on APCoAB programme, progress and future plan. As a result of in-depth discussions, the following major recommendations emerged:

- The outputs of APCoAB workshop on communication strategies to be utilized by APCoAB and APAARI member organizations to develop future strategies for public engagement and debate on agricultural biotechnology.
- Appointment of new APCoAB Coordinator to be taken up on priority. Notification to be sent to all member organizations so that they could nominate candidates for the post.
- APCoAB Progress Report for 2016 to be submitted to COA by the end of December 2016.
- COA has agreed to continue funding support to APCoAB. New Proposal for the next phase of APAARI-COA (2017-2020) collaborative programme based on newly developed APAARI Strategic Plan to be submitted soon. Decision on the requested enhancement of funding support shall be taken by COA after a review of the proposal.
- Activities for 2017 to be initiated soon after the joining of new Coordinator. It is expected that larger number of activities shall be taken up during this year since there would be some additional savings available due to the absence of APCoAB Coordinator during 2015.
- ACIAR-FAO project on regional consultation meetings on biotechnology is presently under discussion and APCoAB will also be involved in its implementation.

Food Safety Management Systems (FSMS): Advanced Course for Small and Medium Enterprises (SMEs) in the Agri-food Industry

APAARI jointly with COA and Asia Productivity Organization (APO) organized a Training Course on Food Safety Management Systems (FSMS): Advanced Course for Small and Medium Enterprises (SMEs) in the Agri-food Industry, on 3 to 7 October, 2016 in Taipei. Six participants from five countries; Nepal, Philippines, Lao PDR, Malaysia and Thailand were sponsored by APAARI.

Food safety that has become a global issue as contaminated food causes widespread health problems with serious implications for families as well as public healthcare systems. It also causes



Participants of training course on food safety management systems

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Implementation of CRP Dryland Cereals Scholarship Programme

Under the Memorandum of Understanding (MoU) between APAARI and ICRISAT, a collaborative CGIAR Research Programme (CRP) on Dryland Cereals Scholarship Programme was implemented. The objective of the programme is to: i) develop a new cadre of scientists with core competencies, knowledge and experience in advanced science and technologies; ii) encourage and develop excellence in fundamental and practical research capabilities of women and early-career scientists in developing countries, and iii) strengthen and enhance human resource capacities of national agricultural research institutions. Six candidates from different universities are pursuing their Ph.D. research work under this collaborative programme. As per the Letters of Agreements between APAARI and the respective Universities/Institutions, the total allocated scholarship grant was USD 150,000 which was subsequently reduced to 94,212 out of which USD 64,212 is allocated for scholarship of these six candidates. Out of this allocated amount, USD 50,000 has been disbursed and the remaining amount of USD 14,212 will be disbursed in January 2017. The CRP-DC Programme will now be closed and the liquidation statement will be submitted to ICRISAT by 31 January 2017.

Knowledge Management Programme

- The APAARI article composed by Ms Martina Spisiakova, Knowledge Management Coordinator is given in the link below: <http://www.apaari.org/news/e-agriculture-solutions-forum.html>
- The APCoAB website was revived with latest relevant news and content uploads regarding Biotechnology as of September 2016. This was done with the help of Dr Karihaloo, Senior Consultant, APAARI <http://apcoab.org/>
- The Common Framework on Capacity Development (CD) for Agricultural Innovation Systems (AIS) of the Tropical Agriculture Platform (TAP) supported by FAO, was promoted during the recent Expert Consultation on Best Practices in Agri-Food Innovations in Asia and the Pacific held in Taichung, Taiwan 1-3 November 2016. This was done through a presentation, display of a poster, brochures and flyers, as well as through the APAARI website



Tamil Nadu Agricultural University

The Genesis

In 1868, a full-fledged public agricultural school was started at Saidapet, Chennai, India for the purpose of training young people in different branches of agriculture. The school was transferred to the control of the Director of Public Instructions in 1884 to achieve stability and controlled development in



Bad Pic

Administrative Block of TNAU, Coimbatore

academic programmes. Later, the foundation stone for the Madras Agricultural College and Research Institute was laid in Coimbatore on 24 September, 1906 by the then Governor of Fort St. George, Chennai, Sir Arthur Lawley. A three year B.Sc. (Ag) degree programme was introduced in 1920. In the year 1960, the 4 year B.Sc. (Ag) degree course was launched.

Tamil Nadu Agricultural University and its Constituent Units

The Tamil Nadu Agricultural University (TNAU) was established in 1971. Currently, TNAU has 14 Colleges and 38 Research Stations with the first Agricultural Research Station started at Kovilpatty in 1901 and the 38th (Citrus Research Station) started in 2015 at Sankarankoil in Thirunelveli district. The TNAU also has 14 Farmer Training Centers in different parts of the state and one University Training Center at Chennai.

Apart from the Directorate of Research and Directorate of Extension Education, Coordinating Research and Extension activities, fifteen Directorates primarily coordinate research activities among the Constituent Departments.

Mandate, Mission and Vision

Mandate

The mandate of the University as defined in Section 4 of the TNAU Act is:

- To impart education in various branches of agriculture and allied sciences, as the university may determine
- To further the advancement of learning and prosecution of research in agriculture and allied sciences
- To undertake the extension of such sciences to the rural people in co-operation with the concerned Government Departments

Mission

- Mission of TNAU is to impart agricultural education aimed at building adequate manpower required for undertaking quality research programmes and dissemination of technologies which are critical for enhancing food security and commercializing agriculture in order to help the farming community in improving their levels of living.

Vision

- To maintain the excellence in agricultural education and research and in the communication of the results of research to target groups
- To collaborate in agricultural education, research, policy interfacing and outreach with national and international institutions
- To make agriculture in Tamil Nadu and India, globally competitive
- To improve the livelihood of people depending on agriculture and other rural avocations

Teaching

Currently, the courses in different disciplines are offered in 14 of its constituent colleges.

Learning Resources

The TNAU library has a collection of over 190,000 books and other publications. It also has a stock of micro-films, slides, video cassettes, CD-ROMs and other resources. On an average, about 3,313 books and other documents are added to the library every year.

Special Features

- The library is provided with internet connectivity. It has access to CeRA journals beside other e-resources (websites) such as; India stat.com, commodity India.com, DELNET resources
- Reciprocal Inter-Library loan agreement between Main Library, Cornell University, USA
- Automation using Auto Lib software integrated with RFID
- On-line Public Access catalogue facility
- Old and rare books and documents are digitized and maintained

Physical and Instructional facilities

The following facilities are available at Tamil Nadu Agricultural University, Campuses:

S. No.	Name	No.
1.	Class rooms	97
2.	Laboratories and glass houses	101
3.	Instructional farms	45
4.	Students hostels	50
5.	Sports – Play grounds	7

Research

TNAU caters to the research needs of seven agro-climatic zones in the State of Tamil Nadu and undertakes research in all the college campuses and 38 research stations, covering agricultural and horticultural crops. The researchable areas and topics are identified through the Annual Researchers Meet, Scientific Workers Conference, Research Council and Extension Council meetings conducted annually.

There are 668 research projects currently in operation. A total of 235 scientists are primarily involved in research besides scientists working in the university campus and colleges. Post graduate students are also involved in the funded research through student fellowships. The UG students are involved in research to certain minimum extent for recording observations, etc. in the field.

Varieties and Implements/Machinery Released and Patents Filed / Obtained

Between 2009 and 2015, a total of 75 varieties / hybrids, 22 implements / machinery and 13 management technologies were released. Some of the initiatives like, spraying of PPFM could help rice crop to withstand drought. Tamil Nadu Agricultural University has applied for a total of 53 patents and so far obtained 7 patents. Overall, 806 crop varieties / hybrids, 164 farm machinery / implements and more than 1,500 management technologies have been released since the inception in the year 1971.

Extension Education and Service

The constituent units of Directorate of Extension Education are; Krishi Vigyan Kendras, Farmers' Facilitation Centre, Training Division, Agricultural Technology Information Center, e-Extension Center, Educational Media Centre (EMC), Community Radio Station and Kisan Call Centre (KCC).

The TNAU AGRITECH Portal (www.agritech.tnau.ac.in) contains more than 700,000 pages of information. The portal recorded more than 1.5 million hits annually. Portal receives about 4,000 visitors daily.

Promotion of Information Based Agriculture

Price Forecasting by Domestic and Export Market Intelligence Cell (DEMIC)

The DEMIC forecasts prices before sowing season and once again before harvest for 24 crops. The forecasts have 95 per cent reliability. The forecasts are disseminated through dailies, periodicals, text SMS, television, radio and also through the Market Committees in the districts. It could help farmers to realize higher unit price.

Weather Forecasting by the Agro-Climate Research Centre (ACRC)

The Agro-Climate Research Centre makes medium range forecasts for different districts and also issues advisory to take-up appropriate crop husbandry practices. This would help to optimize input use, irrigation water and also to plan plant protection measures.

Financial Resources

The major funding agencies are; Tamil Nadu State Government, ICAR, Government of India Departments, Foreign agencies and Private agencies. TNAU also generates revenue from internal sources, such as; fee, farm output, venture capital schemes, license fee for technologies commercialized, self supporting programmes, etc.

Overall Accomplishments

Tamil Nadu Agricultural University was conferred with the ICAR Best Institution Award in the year 2009-10 for the second time. It was also conferred with the 'Overall Excellence Award' by the Federation of Indian Chambers of Commerce and Industry (FICCI) during the 10th Higher Education Summit jointly held by India and UK in 2014 at Delhi. Even while increasing the student strength with over 70 per cent girl students at UG level, the university has provided them sufficient accommodation and other facilities. They are made computer savvy. All the campuses and hostels are provided with Wifi connectivity. On-line examination is being conducted since 2007-08. On-line evaluation and registration of courses are the other features. The TNAU continues to endeavor to improve its system, infrastructure and human resources to deliver quality education, research and outreach services.

TNAU is ranked 2nd after the Indian Council of Agricultural Research in India among all the State Agricultural Universities. The University Grants Commission of India ranked TNAU 40th among more than 5,000 Educational Institutions in India. The BRICS – QS ranking for TNAU 130-140.

(Source: Dr K. Ramasamy, Vice-Chancellor TNAU, Coimbatore ; vctnau@tnau.ac.in)



Release of New APAARI Publications

The Chairperson and Vice-Chairperson officially released two recent publications of APAARI: (i) High Level Policy Dialogue on Investment in Agricultural Research for Sustainable Development in Asia and the Pacific: Proceedings, and (ii) High Level Policy Dialogue on Investment in Agricultural Research for Sustainable Development in Asia and the Pacific: Papers Presented.



Taiwan

Evaluation of the effect of substitution of corn by brown rice in diets on the growth performance and carcass quality of growing-finishing LD pigs

A total of 50 LD (Landrace×Duroc-Jersey) crossbred pigs with average body weight of 30 kg were used. Pigs were allocated into 5 treatments by body weight and fed with five diets, i.e. control, graded levels substitution of corn (SC) in the control diet by brown rice (SC 50%, SC 75%, SC 100% and SC 100% with iron-amino acid). Feed and water were provided *ad libitum*. Pigs were fed the finisher diets when the average body weight reached 65 kg. When body weight reached 120 kg, all pigs were weighed and six pigs from each treatment were delivered to the slaughterhouse and the carcass characteristics



Dairy farm women registering for training programme at Porbandar

The programme was inaugurated by Shri Babubhai Bokhria, Hon'ble Minister of Animal Husbandry, Gujarat State. On the occasion, Shri Babubhai Bokhria encouraged dairy farm women to pursue advanced animal husbandry practices to maximize their income and become self-reliant. He also stressed on judicious savings from the proceeds of dairying for women empowerment.

Prof M.C. Varshneya, Vice Chancellor, Kamdhenu University, highlighted that Kamdhenu University is playing a role of catalyst by promoting clean milk production and increasing milk production leading to rural development in the State. He also appealed for conservation of indigenous breeds of cattle.

Around 800 dairy farm women participated in this training programme. During technical session, training lectures were given by Dr R.G. Shah and Dr M.B. Rajput followed by question answer session and interaction with the dairy farm women. The training was mainly focused on dairying, ration balancing, health and artificial insemination about which trainees obtained recent technical update.

Tamil Nadu Agricultural University (TNAU), Coimbatore

Rice Variety CO 51

This variety was released during the year 2013. Its special features are: i) resistance to blast, BPH and bacterial blight; ii)



CO 51: A high yielding and disease resistant variety of rice



LD crossbred pigs



Graded levels substitution of corn by brown rice

were measured. The growth performance, carcass quality, meat composition, panel test of loin meat and fatty acid composition of the meat were evaluated. The results showed that the pigs fed a diet of SC 50 per cent had more efficient utilization of feed during the growing period. The pigs of SC 50 per cent had less backfat thickness and higher marbling in the loin meat. The overall acceptability of loin from pigs fed the SC 50 per cent did not differ from the control group, but was higher than the other groups. No difference was observed on the fatty acid composition of loin meat among groups. Substitution of corn by brown rice in the diet of growing-finishing pigs to 50% is recommended. (C. W. Liao, B. L. Shih, G. J. Fan, T. C. Yang, H. F. Lee, W. S. Chen, M. H. Lai, and C. F. Lee, Livestock Research Institute, Council of Agriculture, Executive Yuan, Taiwan)

(Source: Siao-huei Jiang, Department of International Affairs, COA, Taiwan; ssjiang@mail.coa.gov.tw)



India

Kamdhenu University (KU), Gandhinagar

Dairy Farm Women Training Programme at Porbandar, Gujarat

The Directorate of Extension Education Kamdhenu University, Gandhinagar organized one-day “Dairy Farm Women Training Programme on “Animal Husbandry, Animal Nutrition, Animal Health and Artificial Insemination” at Porbandar, Gujarat on 16 October 2016 with support of Sudama Dairy, Porbandar.

yields an average of 6.6 tons/ha: 11 per cent higher yield than the popular variety ADT 43; iii) white medium slender grain with good cooking quality; iv) high milling and head rice recovery (67.0%); v) intermediate amylose content, gelatinization temperature and soft gel consistency; and vi) suitable for short duration *Sornavari / Kar / Kuruwai / Navarai* seasons and all early duration rice cultivating tracts of Tamil Nadu.

Papaya Variety CO 8

This variety was released during the year 2012. Its special features include: i) unique red pulped dioecious variety (most dioecious varieties are yellow pulped); ii) high yield potential (230 t/ha) in a duration of 20-22 months; iii) better pulp quality (TSS 13.5%); iv) ideally suited for production of fresh fruits



CO 8: A high yielding and better quality variety of papaya

for dessert purpose; v) suitable for pulping and processing as ready to serve beverages, jam and tutti-fruity; vi) suitable for papain extraction with good papain activity of the latex (138TU/mg); vii) recommended for cultivation in areas with tropical climate having moderate weather conditions; can be cultivated in many parts of Tamil Nadu.

Double Chamber Centrifugal De-huller for Millets Released in 2015

At present, de-hulling for millet is carried out with the abrasive roller type machines. In this process, along with the husk, bran and small portion of endosperm is also removed which leads to the depletion of nutrients. Moreover, the de-hulled grains contain about 20 per cent of broken grains. To overcome these problems, a double chamber centrifugal de-huller has been developed at Post Harvest Technology Centre, Agricultural Engineering College and Research Institute, Coimbatore.



The characteristic features of the variety are : i) 10 per cent more recovery (since the bran is retained in the kernel); ii) suitable for little millet, proso millet, foxtail millet, barnyard millet and kodo millet; iii) the capacity of the de-huller is 300 kg per hour; iv) the efficiency of the unit is 95 per cent; v) breakage of 4-5 per cent; vi) labour required: one person; vii) cost of the unit Rs. 1,20,000 (USD 1,758.75); and viii) cost of operation Rs. 5 (USD 0.07) per/kg.

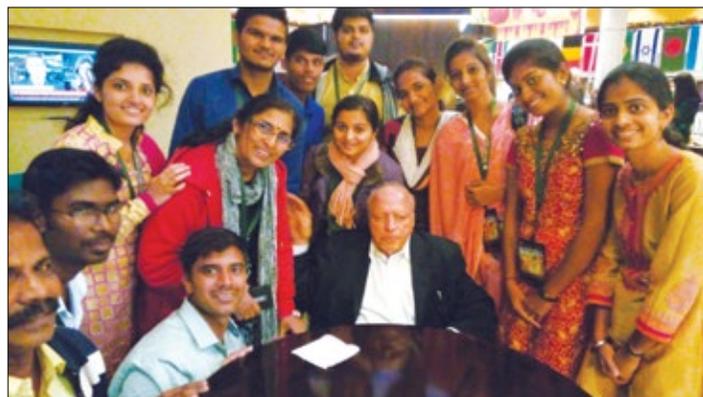
(Source: Dr K. Ramasamy, Vice-Chancellor TNAU, Coimbatore ; vctnau@tnau.ac.in)

University of Agricultural Sciences (UAS), Dharwad

Study Abroad Programme 2016

The second batch of Study Abroad Programme (SAP) -2016 titled 'Food and Agriculture Scenario in North America' was successfully completed in collaboration with Iowa State University, Ames, USA during 2-15 October 2016. During the two weeks training, undergraduate students were exposed to varied situations of agriculture in America in the form of lectures, visits, discussions, hands-on-training. Different areas of agriculture including biotechnology, food science, seed science, forestry, food technology, quality control, waste management, packaging, meat processing were covered during the stay. Students had an opportunity to participate in the famous World Food Prize event for three days at Des Moines and witnessed deliberations by the global stalwarts. It was a rare opportunity for students to interact with World Prize Award winners like Prof M.S. Swaminathan, Dr Maria Andrade, Dr Robert Mwangi, Dr Jan Low and Dr Howarth Bouis.

Further, the students had an opportunity to explore the culture and social ethics of America like work culture, dignity of labour, time keeping, self monitoring, respecting the fellow citizens, etiquettes in day to day life, marketing outlets, entrepreneurship activities and alike. Besides academics, students had lots of recreation and pleasure trips along with learning. They had an opportunity to taste cuisines of different countries. The success of the programme can be credited to the efforts of Iowa State University in meticulous planning and execution of the programme for 14 days and untiring support by UAS, Dharwad. At the tender age of 20-21, Study



Students interacting with world food prize laureate Prof. M.S. Swaminathan

Abroad Programme is a life changing event which facilitates the students to take up further studies abroad.

Global Water Meet, 2016

Scientists, researchers, academics, policy makers, social activists, NGOs and farmers from across 20 countries met at the Global Water Meet 2016 (GWM 2016) organized by the University of Agricultural Sciences, Dharwad, India on 24-26 October 2016.

The participants unanimously agreed for Dharwad Declaration 2016 on Climate Changes, Water and Agriculture which shows ways and means for execution of Paris Agreement and SDG 2030 The Dharwad Declaration will pave the way for creating a Global Forum for initiating a global action plan for restoration of natural water cycles, climate resilience and for taking forward the spirit and message of the GWM 2016.

(Source: Dr Rajendra Poddar, Head, PPMC, UAS, Dharwad; poddarrs@uasd.in)

Uttarakhand University of Horticulture and Forestry, Bharsar

Empowering Rural Women through Food Processing Training Programmes

Agriculture occupies a vital position in the overall economy of our country. It not only provides food and raw material but also employment opportunities to a large proportion of population. However, a huge quantity of the fresh commodities like fruits and vegetables are being wasted due to lack of adequate postharvest handling and processing techniques. The agriculture sector can further be strengthened if these postharvest losses are minimized throughout the value chain. The need for women involvement in agriculture training programmes is crucial to make sure that their full potential is utilized.

The Institute of Food Science and Technology of Uttarakhand University of Horticulture and Forestry has taken the initiative in empowering the rural women through such skill development programme especially in the field of food processing and preservation. Number of trainings (on and off-campus) were organized regularly on value addition of seasonal fruits and vegetables, regional staple foods like finger millet (ragi), etc. Speakers from the nationalized banks were invited to brief these



Women participating in food processing training

participants on various subsidies given by the government and how they can make best use of such schemes.

The training includes a group of 30-40 rural women from nearby villages generally in the age group of 25-40 yrs. The group is further divided into small groups of five members each and then given hands-on practical trainings. The different value added products prepared by these participants are jam, chutney, squash, pickle, preserve, candy, papad, biscuits, etc. The feedback from the participants suggested to conduct trainings at their villages as they wanted to attend such programmes but could not take out time and so many other trainings were organised at their venue.

The participants also showed their willingness to start their own cooperatives for establishing home-scale processing units.

(Source: Dr Surabhi Sharma, Officer-in-charge, IFST, Uttarakhand University of Horticulture and Forestry; surbhism1@gmail.com)



Fiji

New Cherry Tomato Variety Released in Fiji

Research and development plays an important role in Fijian Government's plan for the long-term sustainability and growth of the agricultural sector. Research on higher yielding varieties, low cost of production, pest and disease tolerance and resilient to the effects of climate change are vital for food and nutrition security.

Fiji imports 300 tonnes of tomatoes annually at a value of FJ\$2.5 million. The price of locally produced tomatoes in the market ranges from \$1.71/kg in the main season to \$4.50 during offseason.

The Fiji Ministry of Agriculture in collaboration with the World Vegetable Centre (formerly AVRDC) and the Secretariat of the Pacific Community (SPC) under the Australian Centre for International Agricultural Research (ACIAR) funded Integrated Crop Management (ICM) Project released a new cherry tomato variety for commercial cultivation. In honor of Fiji's gold medal win in the Rio Summer Olympics in August 2016, the new variety was named "Rio Gold". Fiji won its



Bad Pic

New cherry tomato variety "Rio Gold" released by the Ministry of Agriculture, Govt. of Fiji

first ever gold medal in any Olympics and this is also the first cherry tomato variety being released in Fiji. It has been tested for four years in two climatic zones and is highly recommended for local conditions in Fiji.

The marketable yields from the regular season field trials on station and on farms in the Sigatoka Valley recorded yields as high as 60 tonnes per hectare. The variety is resistant to bacterial wilt and tobacco mosaic virus. Rio Gold is a variety for which farmers can produce and save their own seeds for future use.

There is a lot of demand for cherry tomato in the hotels and until now we have been importing cherry tomatoes in Fiji. The new release will make it possible to use our local produce in our hotels.

The Ministry of Agriculture will continue to conduct research, evaluation and release of new varieties of crops to boost production, improve farmers' income and provide diversity in the agricultural sector in Fiji.

(Source: Dr Apaitia Macanawai, Act. Director Research, Ministry of Agriculture, Fiji; apaitia.macanawai@govnet.gov.fj)



Philippines

Detection and Control of Cacao Disease

The cacao industry has great potential in the Philippine market, not only as a source of food but also as a good source of medicines. However, the industry is now facing disease management threat.

Addressing this concern, government and private agencies worked together to better understand, detect, and control the Vascular Streak Dieback (VSD) through a hands-on seminar.

Held on 21 July 2016 at the Cacao Agribusiness Zone Center, Cocoa Foundation of the Philippines, Inc. (CocoaPhil), Talandang, Tugbok, Davao City, the hands-on seminar sought to disseminate information on management and detection of VSD through biological-based approaches.

Fifty participants from both government and private agencies and local cacao farmers attended the seminar. Aside from the lectures and presentations, the participants also engaged



Participants during the nursery and plantation visit and hands-on training (Photo by Dr D.M. Amalin, DLSU Programme Leader)

themselves on hands-on activities during the cacao nursery and plantation visit.

The Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD) is supportive of the cacao industry, being one of the priority crops under its Industry Strategic Science and Technology Programmes (ISPs). The programme seeks to further develop the cacao industry through science-based solutions and innovations.

VSD has been found in most cocoa-growing areas in South and Southeast Asia, and Papua New Guinea. It has been a major problem in the large commercial plantations in West Malaysia and Sabah. It is widespread in Indonesia, including in the cocoa plantations in East and West Java. Cases of VSD are also reported from Southern Thailand, Burma, Vietnam, and the Southern Philippines.

When cacao tree is infected with VSD, irregular patch or unsightly marks appear on its leaves until they deteriorate. The deterioration begins from the second or third flush behind the shoot apex. Eventually the shoot apex as well as the infected branches die. The fungus may grow through the xylem down into the main stem and kill a mature cacao tree.

Early detection is very important for the control of the disease. To manage the disease, biological control is being developed in a programme titled, "Cacao Pest Management Programme: Biological-based Approaches", which is being implemented by the De La Salle University (DLSU), University of the Philippines Los Baños (UPLB), and is funded by DOST-PCAARRD. A VSD pictorial guide was provided during the seminar to initially aid the farmer-participants on VSD detection both on cacao seedlings and planted trees.

The importance of using biological-based approaches was stressed as a better and sustainable strategy in managing pests and diseases of cacao compared with the chemical-based control methods.

(Source: Dr R. Ebor, Acting Executive Director, PCAARRD, Philippines; pcaarrd@pcaarrd.dost.gov.ph)



Participants from different agencies and cacao stakeholders (Photo by Dr D.M. Amalin, DLSU Programme Leader)

APSA

Seed Business Blossoms at 23rd Asian Seed Congress

The 23rd Asian Seed Congress (ASC) organized by the Asia and Pacific Seed Association (APSA) at Incheon, South Korea from 7-11 November 2016 with the support of a National Organizing Committee (NOC) in alternating host countries, was sponsored this year by the Korean Seed Association and the Korean Seed and Variety Service (KSVS). More than 1,250 delegates from 50 countries around the world attended the Congress

Delegates attending ASC represented mostly APSA members, including national and regional seed associations, government agencies, research institutions and enterprises dealing in seed, agro-inputs and biotechnology. Most of APSA's members came from Asian countries. The association also includes associate members from Europe, Africa and the Americas, who are all keen to relay and exchange seed market and industry intelligence in Asia, one of the world's fastest growing regions.

Host to a series of technical meetings and workshops covering everything from hybrid rice, cover crops and vegetables, to seed technology and the rights of plant breeders (PBR) and intellectual property (IPR), ASC's main attraction was an exhibition with hundreds of booth, meeting rooms and trading tables facilitating networking, business and trade of quality seeds.

New President

Ms Brenda Dossey, Managing Director of Gold Coast Agribusiness Pty. Ltd., Australia was appointed APSA's 22nd President and confirmed at the APSA Executive Committee (EC) meeting.

Prior to serving on APSA's EC, Ms Dossey served as Chair and Co-Chair of the Special Interest Group on Forage and Amenity Turf Seeds (Cover Crops) for many years. She has also been an APSA guest participant for an APSA Long Term Planning Meeting and Governance Review.



APSA's 22nd President,
Ms Brenda Dossey

Former President, Mr Wang Zhiping, Managing Director and President of Celestial Seeds, China will now serve one year as Immediate Past President before stepping down from the EC. Mr Jack Metzelaar, Vice President of Sales Asia for HM Clause, Thailand, who was re-elected to the APSA EC at the Association's General Assembly Meeting (GAM) on 10 November 2016 will serve a second two-year term as APSA Treasurer.

Filling out the Office Bearer roles is the new Vice President elected from within the EC, Muhamad Tahir Saleemi representing Haji Sons, Pakistan.

Opposition to Child Labour

The ASC ratified the Association's official stance opposing child labor in the seed industry. APSA members unanimously voted to ratify the position at the General Assembly Meeting on 10 November 2016. Mr Michel Devarrewaere, Vice President of East West Seed Company, and Chairman of APSA's Vegetables

and Ornamentals Special Interest Group said, "We came up with the initiative following the Asian Seed Congress in Goa last year when a rather damaging report exposing the use of child labour in the industry came to our attention." He noted that the practice of utilizing child labour prevails in many Asian countries' seed sectors. It was realized that this was a big concern for every company producing seed in the region and so a small working group, comprising representatives of companies was formed, who had actually tackled the issue on the ground. The resulting paper reaffirmed APSA's clear and firm stance against child labour alongwith guidelines on how to prevent child labour in seed operations.

Passing on the flag

Every year, the ASC is held in a new host country within the APSA territory. This year's flag-waving ceremony welcomed to stage a delegation on behalf of the Philippines Seed Industry



Traditional flag waving ceremony to confirm the hosts of ASC 2017

Association, who confirmed the 24th ASC to be held in Manila from 12-17 November 2017.

(Source: Steven Layne, Communications Officer, APSA; steven@apsaseed.org)



CACAARI

9th Steering Committee Meeting of CACVEG

The 9th Steering Committee Meeting of Regional Network for Vegetable Research and Development in Central Asia and the Caucasus (CACVEG) took place on 25-27 October 2016 in Tashkent, Uzbekistan. The meeting was attended by the national coordinators on research and development of vegetable production, specialists from CAC countries and the representatives, leading specialists of the World Vegetable



Steering Committee Meeting of CACVEG in Session

Center and donor organizations. The meeting was officially opened by the key stakeholders in the face of ICARDA-CAC Regional Representative Office, CACAARI, World Vegetable Center for South Asia and Central Asia and World Vegetable Center for Central Asia and Caucasus (CAC).

The meeting included the presentations of leading specialists from World Vegetable Center and the national coordinators of the CAC countries on collaborative work with the World Vegetable Center and discussions of regional varietal trials of vegetable crops, cooperation within the framework of new projects implemented on vegetable production and reports on innovative jointly research in the field of vegetable production.

CACAARI was represented by the Executive Secretary, Dr Alisher Tashmatov who provided a general overview on the activities of World Vegetable Center and particularly the Regional Office for CAC. He expressed his sincere gratitude for the work of the World Vegetable Regional Office for CAC, especially to Dr Ravza Mavlyanova for her productive work and significant contribution on developing the vegetable production research in CAC. He also emphasized on collaborative work of the World Vegetable Center and CACAARI. Dr Warwick Easdown provided a general overview of activities of CACVEG.

Basically, the discussion aimed at jointly conducting a socioeconomic analysis on the constraints of vegetable varieties in Central Asia, improving the demand, dietary diversity and the value chain and the role of different stakeholders including youth in the regional network. Dr Alisher Tashmatov also had a discussion with Dr Rafik Khakimov, National Coordinator of Vegetable Production for Uzbekistan and Co-Chair of CACVEG Regional Network regarding partnership with the World Vegetable Center. Dr Khakimov stressed on the need for training young professionals and scientists, the capacity development of national stakeholders and the high priority need to introduce English language courses in each country of CAC so that young people can receive internship positions at the World Vegetable Center and other the international centers.

(Source: Dr Alisher A. Tashmatov, Executive Secretary, CACAARI; a.tashmatov@cgiar.org)



SPC

Saving the Pacific's Coconuts

Government representatives from Fiji, Papua New Guinea and Samoa met in Lautoka, Fiji with other Asia-Pacific and international stakeholders to launch a mission to help protect Pacific coconut diversity and associated livelihoods from climate change and other threats. The mission will be coordinated by Bioversity International and COGENT in collaboration with the Pacific Community.

Bioversity hosts the international Coconut Genetic Resources Network (COGENT) which has 40 country members representing 98 per cent global production (with 80% produced in Asia). COGENT will publish a new Global Strategy for Coconut Genetic Resources Conservation and Use (see <http://www.cogentnetwork.org/>). Whilst current work focuses mostly



Participants of inception workshop at Lautoka, Fiji

on conserving coconut genetic resources, COGENT has links to work along entire coconut value chain, for their better use.

COGENT organized an inception workshop on 14 - 17 June 2016 in Lautoka, Fiji in conjunction with the Pacific Community (SPC). The workshop has gathered the main project partners: the Asia and Pacific Coconut Community (APCC); COGENT/Bioversity International (Coordinator of the project); the curator of the South Pacific International Coconut Genebank (ICG-SP) hosted by the Cocoa Coconut Institute (CCI) in Papua New Guinea (PNG); Government relevant ministries from Fiji, PNG (represented by Kokonas Industri Korporasen, KIK) and Samoa; and the Pacific Community (SPC), the Centre de coopération Internationale en Recherche Agronomique pour le Développement (CIRAD); the Global Crop Diversity Trust (GCDDT); Also invited for the meeting include representatives from: the Australian Centre for International Research (ACIAR- Pacific region); the FAO Sub-regional Office; the regional focal points for the Convention on Biological Diversity (CBD), and for the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA, The Treaty).

The 3-year project on “Upgrading and Broadening the New South-Pacific International Coconut Genebank” is funded by the Darwin Initiative (<http://www.darwininitiative.org.uk/>), a UK government grants scheme helps to locally protect biodiversity and the natural environment worldwide. A new International Coconut Genebank (ICG) is to be established in Papua New Guinea (PNG), where the existing ICG (ICG-SP) is threatened by a lethal yellowing disease, *Bogia Syndrome*. A proposed transfer of the ICG-SP, partly supported by the Government of PNG, from Madang to Punipuni in PNG, with a duplication back-up planned in Fiji and Samoa, is a unique opportunity to collect and protect endangered cultivars. The project will amend the current list of coconut varieties held in the ICG-SP with new varieties coming from other Pacific countries. Selection of new varieties will be based on several validated criteria.

A partner-panel of experts from international, regional and local organizations will collaborate to identify the most threatened coconut varieties on habitat loss during the next 40 years. A zone of ‘most-endangered areas’ will be established and explored for identification and characterization of unknown or “orphan” coconut varieties. Other criteria such as uses, and resistance to cyclones or diseases will also be considered. The identified and selected varieties will then be safely moved

Contd. on Page 20...

IRRI

IR8, world's first high-yielding rice, turns 50

November 2016 marks the 50th anniversary of IR8; the world's first high-yielding rice variety and the first rice variety released by the International Rice Research Institute (IRRI).

IR8 sparked the Green Revolution in Asia—a phenomenon that saved the region from famine in the 1960s and 1970s. This scientific innovation was soon followed by other high-yielding varieties that each offered increasing vigour and resistance to pests and disease—the major scourges of that period. These varieties were also adaptable where they were most urgently needed: the Philippines, Vietnam, Myanmar (then Burma), Cambodia, Indonesia, Malaysia, and the biggest of them all—India.

A series of global events took place in New Delhi on 21 November and at IRRI headquarters in the Philippines on 29 November 2016 to commemorate this milestone in food security.



Scientists examining IR8 in the field at IRRI, Philippines

Miracle Rice

In the 1950s, Asia was on the brink of famine and millions of people were in danger of starving. In 1960, IRRI was established with one pressing mission: to develop high-yielding rice varieties.

Thus began intensive research and breeding work that sought ultimately to enable the production of more-much, much more-rice than previously possible in order to stave off predicted mass food shortages across the continent.

IR8 is the first offspring of these efforts. It is a semi-dwarf rice and was the result of a cross between Peta, a tall vigorous variety from Indonesia, and Dee-geo-woo-gen, a dwarf variety from Taiwan.

In the 1960s, average yield in the Philippines was at about a ton per hectare. In initial tests at the IRRI fields in Los Baños, IR8 produced an average of 9.4 tons per hectare.

In the business of growing food, this breakthrough is no small deal. The Philippine press dubbed the grain a befitting “Miracle Rice.”

IR8 and Jaya in India

Earlier this year, Prime Minister Mr Narendra Modi launched a seven-point strategy that aims to double rice farmers' income and reduce rural poverty by 2022 through innovations in food and farming.

This strategy will propel India's vibrant rice sector onto another promising trajectory, made possible by a rich history in plant breeding innovation.

In the late 1960s, IR8 was introduced in India at about the same time another variety, 'Jaya,' was released. Quick field evaluations and rapid promotion of the two varieties by the Indian government, with the help of some pioneering Indian farmers, started the country's own Green Revolution in rice.

Jaya, bred from an IRRI-introduced variety and an indica variety, is a high-yielding semi-dwarf rice that produces long, bold grains—preferred qualities of the Indian palate. It was a product of intensive breeding under the All-India Coordinated Rice Improvement Project (AICRIP), a collaboration between India and IRRI launched by the Indian Council of Agricultural Research (ICAR) in 1965.

The event on 21 November 2016 celebrated this rich history in which a panel of global experts spoke on the future of the rice industry.

Back where it all started

In the Philippines, where IR8 and succeeding high-yielding rice types had their first real-world tests, the 50th year celebrations were held in a *Farmers' and Partners' Day* at the IRRI headquarters in Los Baños on 29 November 2016.

Agriculture Secretary Manny Piñol presented the Philippine government's rice programme in a session. The Philippine Department of Agriculture is a staunch partner of IRRI in its mission and in the IR8 commemoration.

Peter Jennings, who led the breeding team that developed IR8, had spoken about IR8 and the revolution it catalyzed.

(Source: V. Bruce J. Tolentino, DDG and Secretary, IRRI; b.tolentino@irri.org)



World Vegetable Center

Virus-resistant tomatoes prompt huge seed industry interest

The world's second largest tomato producing country gave a resounding vote of confidence in the breeding work of the World Vegetable Center through a successful field day held on 7 September 2016 at the WorldVeg South Asia campus in Hyderabad, India—and presented a national partnership award to tomato breeder Peter Hanson.

The first WorldVeg tomato virus field day ever held in India was an outstanding success, attracting more than 70 seed industry staff representing 38 companies from across the country.

Peter Hanson and Virologist Lawrence Kenyon discussed the complexity of virus resistance and the Center's breeding work to address the issue. Viruses cause immense problems for tomato growers, who spray their crops repeatedly to control whitefly, a pest that spreads viruses.

The value of the Center's tomato breeding work to India was highlighted by the presentation to Peter Hanson of a top partnership award by Dr A.T. Sadashiva from the Indian Institute of Horticultural Research. The prestigious award from the Indian Council of Agricultural Research was for outstanding interdisciplinary research to produce improved tomato varieties for Indian farmers.

A recent WorldVeg survey of the Indian seed sector found that one in six commercial hybrid tomato plants and more than one in three public sector hybrid plants sold in India contain germplasm from the World Vegetable Center.

Seed companies are working hard to produce stable resistance and to address the complex of viruses that are often involved. A major focus of their concern is tomato yellow leaf curl disease caused by begomoviruses. The World Vegetable Center is currently conducting a multilocation trial supported by members of the Asia Pacific Seed Association to assess the performance of 15 improved WorldVeg tomato lines pyramided with different resistance genes for the disease.



Participants viewing the field trials of tomato

needs of the industry. The success of the field day and the unmet demand indicate a major continuing role for the Center in supporting the growth of the Indian tomato seed industry.

(Source: Maureen Mecozzi, Head, Communications and Information, World Vegetable Center; maureen.mecozzi@worldveg.org)



CABI

Sustainable Tea Production - An Ecological Approach to Pest Management

Over the past year, CABI has been working hard on sustainable tea production under the project commissioned by Unilever Ltd. that aims to develop a toolkit for non-chemical, economic pest management practices in the tea ecosystem. Project activities have focused on three tea estates in different agro-ecological zones in Assam. Monitoring and record keeping of plant yield, tea pest incidence and disease infestation has been undertaken at project sites with various integrated pest management and ecological pest management strategies.

Tea is infected by more than one thousand insect and mite species globally. Various synthetic pesticides are widely used



An ecological approach to pest management for sustainable tea production



Seed Production officer Lucy Sarkar addressing participants in the field

The field day featured these improved lines on the WorldVeg research site in Hyderabad. Established by seed production officer Lucy Sarkar, the trial amply demonstrated the robust performance of several lines with multiple gene resistance, and tracked the progression of the disease in each line over the season.

"We were absolutely overwhelmed by the interest the field day generated," said South Asia Regional Director Warwick Easdown. "Because of a lack of space we had to turn away more than 40 other seed industry staff who wanted to come. We will definitely be organizing more field days in the future."

As an indication of the interest in continued collaboration, 45 attendees stayed on after lunch for a strategic planning session in the afternoon to discuss future tomato field days and the

to control these pests. However, the excessive use of chemicals causes ecological, economical and health problems. The project aims to combat pests and diseases through ecofriendly and sustainable pest management by avoiding the use of toxic chemicals.

The pest and disease management strategies will subsequently be upscaled to other tea producing zones in India, as well as other regions. The field experiments have researched trials of non-chemical approaches like the use of Hot Melt Pressure Sensitive Adhesive (HMPSA), tree banding, standardized use of traps, pheromones, ecological farming, nutrient composting, etc. The field trial results have been encouraging with success stories including the revival of plant health from fungal attack using biological control. The yield obtained using non-chemical pest management practices is comparable to that of chemical practices used conventionally in the plots. The number of natural enemies is also increasing, which is a sign of sustainability for pest control measures.

The project emphasizes a systems' approach of environmental health, soil health and bush health with optimum pest-predator ratio to keep the pest population below economic threshold levels. This project supports Unilever's strong ecological vision and its commitment to sustainable tea production. Looking to the success achieved in the first year, we are hopeful that once the entire roadmap has been followed and all results obtained for making a toolbox of best practices, it will open new vistas in ecological pest management in monoculture plantation.

(Source: Rachel Winks, PR and Social Media Manager, CABI, UK; r.winks@cabi.org)



The Crawford Fund

'Poor Management of Science Leads to Poor Science' – the Inaugural Crawford Fund Master Class on Agricultural Research Leadership and Management

The Crawford Fund organized a Master Class in Agricultural Research Leadership and Management at the WorldFish Centre, Penang, Malaysia during 6-11 November 2016. The training was attended by twenty-three (23) mid-career participants from national agricultural and extension agencies, the CG system (IWMI, CIMMYT, ICRAF, ICARDA, ILRI and WorldFish) and universities attended

The class was sponsored by the Crawford Fund with help from APAARI and ACIAR. APAARI also identified seven participants from Bhutan, Nepal, Pakistan, Lao PDR, Vietnam, Malaysia and the Philippines. Other participants were from Sri Lanka, Jordan, Mexico, Indonesia, Belgium, the USA, the UK and Australia.

The Master Class was conducted by Shaun Coffey (past CSIRO Chief and CEO of a New Zealand Crown Research Inst.), Colin Chartres (past IWMI DG), Lynne O'Brien (formerly Australian Department of Agriculture) and Mark



Participants of the Master Class on Agricultural Research Leadership and Management

Hardwick (formerly CSIRO). Its focus was on leadership and management skills and tools at the research programme level.

Class content focused on strategic planning, institutional organization and structure, programme leadership and management, research monitoring and evaluation, human resources management, financial planning and management and communication to donors and stakeholders. Sessions were focused around a mixture of presentations, individual learning and role plays. A key feature was the development by participants of individual learning plans, which will be followed up over the next six months.

Participant discussions were robust, constructive and insightful, and the key message was 'Poor management of science leads to poor science'. Not surprisingly, people management issues dominated, and were subject to several major simulations and activities during the Master Class.

There are popular perceptions of individual geniuses working alone coming up with dramatic breakthroughs. This is essentially myth. The reality is that for most of research, the process of scientific discovery and the creation of knowledge is incremental, with many individuals working collaboratively, sharing information and building on the creative ideas of each other. Research teams and research organizations are essential to delivery of research impacts.

Feedback on the course from participants was extremely positive with respect to content, presentation style, what they had learned and how it would help them in their jobs, and that they were likely to highly recommend the Master Class to colleagues.

The Crawford Fund intends to run this Master Class, at least once, again in 2017, and is also holding discussions with organizations interested in an in-house version of the Master Class. Information will be made available through APAARI and the Crawford Fund website.

(Source: Dr Colin Chartres, Director, Training and Master Classes, colin.chartres@crawfordfund.org and Shaun Coffey, ceo@shauncoffey.org, The Crawford Fund)



Delhi Declaration on Agrobiodiversity Management

The 1st International Agrobiodiversity Congress held in New Delhi, India, from 6-9 November, 2016 was attended by over 900 participants from 60 countries. Congress delegates discussed various aspects of conservation, management, access and use of agrobiodiversity in 16 technical sessions, four satellite sessions, a genebank roundtable, a public forum, a farmers' forum and poster sessions. Based on detailed deliberations, the delegates unanimously adopted the following declaration in the concluding session on November 9, 2016:

Preamble

- Agrobiodiversity includes crop varieties, livestock and fish breeds, and agriculturally useful insect and microbial species. Significant progress has been made towards the documentation, collection, conservation and use of agrobiodiversity related genetic resources, yet much more needs to be done towards their sustainable use, greater exchange and knowledge and technology transfer.
- If conserved and used sustainably, agrobiodiversity could make an important contribution towards resolving problems of hunger, food insecurity, malnutrition and climate change, thus help in attaining the Sustainable Development Goals (SDGs) and the Aichi Targets of the Convention on Biological Diversity.
- Limitations in policies, investment, infrastructure, technical capacity as well as cross-sectoral coordination and partnerships have often prevented efficient use of agrobiodiversity. This is particularly alarming since it is projected that the world, where almost 795 million people go hungry today, will need 70% more food to feed 9.6 billion people by 2050 (FAO, 2015). Hence, high priority and policy support by world leaders and organizations is warranted for enhanced use of agrobiodiversity.
- The world is also facing rapid loss and extinction of biodiversity. It is estimated that species are being lost at 1,000 to 10,000 times the rate at which natural extinction took place at any time during the past 66 million years mainly due to explosive population growth and overexploitation of natural resources. Extinction of agrobiodiversity and associated traditional knowledge is an irreversible process and hence must receive priority attention. In fact, loss of a gene is a major loss for our future generations.

Declaration

1. We call upon nations to accord top priority to the shared vision of agrobiodiversity conservation and sustainable use towards achieving the Sustainable Development Goals (SDGs) and the Aichi Targets of the Convention on Biological Diversity addressing poverty alleviation, food, nutritional and health security, gender equity and global partnership.
2. We recognize the importance of traditional agrobiodiversity knowledge available with farm men and women, pastoralists, tribal and rural communities and its central role in the conservation and use for a food secure and climate resilient world. We, therefore, call upon countries to develop the necessary legal, institutional and funding mechanisms to catalyze their active participation.
3. We urge researchers and the policymakers to initiate, strengthen and promote complementary strategies to conserve agrobiodiversity through use, including greater emphasis on using crop wild relatives. We call for them to ensure a continuum between ex situ, in situ, on-farm, community-based and other conservation methods with much greater and equal emphasis on each.
4. We propose that researchers employ modern technologies including, but not limited to, genomics, biotechnology, space, computational, and nano-technologies for genetic resources characterization, evaluation and trait discovery. The aim must be to achieve efficiency, equity, economy and environmental security through diversified agricultural production systems and landscapes.
5. We reemphasize the necessity of global exchange of plant, animal, aquatic, microbial and insect genetic resources to diversify agriculture as well as our food basket and to meet the ever-growing food and nutritional needs of all countries. To ensure this, nations need to be catalysed to adopt both multi-lateral (as envisaged in the International Treaty on Plant Genetic Resources for Food and Agriculture) and bilateral (as per the Nagoya Protocol) instruments to facilitate the exchange of genetic resources, while ensuring equitable access and benefit sharing opportunities.
6. Countries are also expected to harmonize their existing biosecurity systems, including phytosanitary and quarantine, and enhance their capacities to facilitate safe trans-boundary movement of germplasm.
7. We also expect that the governments and civil societies lay much greater emphasis on public awareness and capacity enhancement programmes on agrobiodiversity conservation in order to accelerate its effective and efficient use.
8. We recommend the development and implementation of an Agrobiodiversity Index to help monitor on-going genetic resource conservation and management efforts, with particular emphasis on agrobiodiversity hot spots.
9. It is also urged that public and private sectors and civil societies henceforth actively invest in and incentivize the utilization of agrobiodiversity to mitigate malnutrition, increase the resilience and productivity of farms and farming households and enhance ecosystem services. Such efforts should lead to equitable benefits and opportunities, with particular emphasis on women and youth.
10. We urge countries to reprioritize their research and extension with increased investments to support the conservation and use of agrobiodiversity. Furthermore, we strongly recommend to create an International Agrobiodiversity Fund as a mechanism to assist countries and communities in scientific *in situ* and *ex situ* conservation and enhanced use of agrobiodiversity.
11. We urge the United Nations to consider declaring a 'Year of Agrobiodiversity' in order to draw worldwide attention and catalyse urgent actions for effective management of genetic resources by the global community.
12. Finally, we recommend that the *International Agrobiodiversity Congress* be held every four years, with Bioversity International playing the facilitator's role, to maintain the momentum gained in 2016 and continue emphasizing the need to implement the 'Delhi Declaration on Agrobiodiversity Management' and monitor the progress so made by the different stakeholders and countries.

Director General, ICARDA

Mr Aly Abousabaa assumed the office of Director General of ICARDA in October 2016. He is an Egyptian national and Civil Engineer by training, with 33 years of professional experience in strategic leadership in sustainable development, operational and policy-based lending, as well as project and portfolio management.



Previously, Mr Abousabaa served as the Vice President of Agriculture, Water, Human Development, Governance and Natural Resources at the African Development Bank Group (AfDB). Mr Abousabaa helped prepare and execute AfDB's strategies which had transformational impact on the lives of millions of people in Africa. He was in-charge of resource mobilization and the management of a US \$11 billion portfolio in the areas of agriculture, water, natural resources management, climate change, green development, governance, women and youth, as well as human and infrastructural development. His experience spans more than 35 countries in the Middle East, Africa and Asia.

Chairman, PARC

Dr Yusuf Zafar joined as Chairman of the Pakistan Agricultural Research Council, Government of Pakistan, Islamabad on 4 October 2016.



Dr Zafar has 35 years of experience in Life Sciences/Biotechnology. During his career, he was involved in activities related to Academics, Research & Development and Agri-biotechnology. He was founding team member of National Institution of Biology & Genetics (NIBGE) Faisalabad and National Institute for Genomics and Advanced Biotechnology (NIGAB). Dr Zafar was instrumental in the development of three varieties of cotton and four varieties GM cotton (Bt) which were released for commercial cultivation and 28 cases of GM plants were submitted to NBC, EPA for approval.

Dr Zafar held key administrative and research managerial posts which include Head of Division, Plant Biotech, NIBGE, Faisalabad; Director (NIBGE) Faisalabad; Director General, Pakistan Atomic Energy Commission; Project Director, NIGAB, Islamabad; Project Management Officer (PMO), Technical Cooperation – Asia & Pacific (TCAP), IAEA, Vienna, Austria; and Minister Technical, Permanent Mission of Pakistan to IAEA, Vienna, Austria. In recognition of his excellence in agricultural sciences, he was conferred with the Best Scientist of the Year Award 2012 by International Cotton Advisory Committee (ICAC), Washington DC, USA. The Government of Pakistan awarded Civil Award (Tamgha-i-Imtiaz) in 2004. He was declared as the best scientist by PAEC in 2000. He also won Research Productivity Awards (RPA) announced so far by

Ministry of Science and Technology, Government of Pakistan based on quality publications at international level. He was appointed Governor from Pakistan to International Center of Genetic Engineering & Biology (ICGEB), Trieste, Italy. He was Member, Inter-Agency Task Force on Biosafety and Biosecurity by Ministry of Foreign Affairs, Government of Pakistan.

Dr Zafar, has excellent academic and professional career. He obtained his Ph.D. degree from Germany. He conducted three post-doctoral fellowships in USA and one in Italy. He was Fellow of Rockefeller Foundation as well as USDA Cochran Fellow. Dr Zafar has to his credit more than 200 publications in international reviewed journals with impact factor, contributed chapters in 3 books of International Publishers and edited of one book.

Director General, DOA, Thailand

Dr Suwit Chaikiattiyos joined as Director General, Department of Agriculture (DOA), Ministry of Agriculture and Cooperatives, Bangkok, Thailand in October 2016. Prior to this, he held several important positions including, Inspector General, MOAC, Deputy Director General, DOA, Director of Horticulture Research Institute, DOA, Bangkok, Director of Office of Agricultural Research and Development Region 6, DOA, Chantaburi, Director of Planning and Technical Division, DOA, and Director of Nongkhai Oil Palm Research Centre, DOA, Nongkhai.



He obtained his Ph.D. degree from the University of Queensland, Australia in 1992, M.S. from the Kasetsart University, Thailand in 1986, and B.Sc. (*Honor*), from the Kasetsart University, Thailand in 1980. Dr Suwit Chaikiattiyos has a long and rich experience and effectively implemented several national and international projects and presented papers in international conferences. He has to his credit a large number of publications in reputed journals and proceedings of international conferences/symposia/workshops.



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Food Safety Management Systems (FSMS)...

reduced workforce productivity. Both developed and developing countries share concerns over food safety as international food trade and cross-border movements of people increase.

The training course comprised lectures on overview of food safety regulation, various national food regulatory systems, approaches and project plans for FSMS, case studies and assessment of FSMS. Site visits to food manufacturing and processing facilities were also organized. All the participants felt that the lectures, group activities and discussion were immensely useful in enhancing their knowledge for implementing the modern FSMS.



APAARI Staff Changes

Dr Raghunath Ghodake concludes his assignment as APAARI Executive Secretary

Dr Raghunath Ghodake concluded his two-year assignment as APAARI Executive Secretary on 31 December 2016 due to his ill-health. Dr Ghodake transferred the roles, responsibilities and planned programme activities of APAARI to the recently appointed Interim Executive Secretary, Dr Bhag Mal. Besides executing these activities during the interim period of 6 months, Dr Bhag Mal will be facilitating the appointment of a new Executive Secretary of APAARI .



Dr Raghunath Ghodake joined APAARI as its Executive Secretary in January 2015, when APAARI was to deal with the challenges of the post-2015 development agenda. The challenges were that of how APAARI would be relevant and effective in strategically and meaningfully contributing to the sustainable agricultural development and to the realization of the sustainable developments goals in the Asia-Pacific Region.

During this crucial two-year period, Dr Ghodake led APAARI superbly well in designing APAARI Vision 2030, which affirmatively focuses on strengthened agri-food research and innovations in Asia and the Pacific; the consideration being APAARI's unique position, as regional platform of its kind, in contributing to the overall development of humankind in the region. Further articulated directions and guidance were provided by way of the APAARI Strategic Plan 2017-2022, which charts the pathways to the strengthened agri-food research and innovation systems in Asia and the Pacific. In successfully developing the Strategic Plan, APAARI has realized a watershed accomplishment in systematically addressing the post-2015 development agenda towards 2030. Dr Ghodake

strongly believed that APAARI must move away from business as usual and must change its governance and development and implement the Strategic Plan with sincerity, conviction and rigor. That would prove APAARI to be a successful platform in addressing and contributing to the 2030 development agenda in Asia and the Pacific.

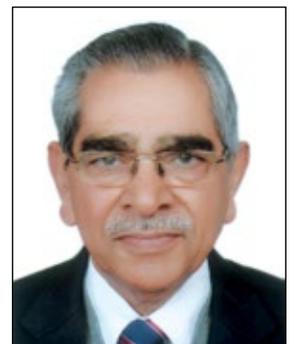
The two-year period also saw APAARI's targeted focus given to the major fundamental issues of policy advocacy and improved investment in agri-food research and innovations in Asia and the Pacific region and leading on these issues at the Global Conference on Agricultural Research for Development (GCARD 3). He also addressed and consistently followed the well streamlined and high priority areas through a series of complementary and synergistic events and actions. While joining APAARI, Dr Ghodake was no stranger to APAARI and to the agri-food research and innovation systems in the region and globally. He served as Director General of the PNG National Agricultural Research Institute (NARI) for 12 years, and was responsible for leading the establishment and nurturing of NARI and developing it as a centre of excellence in agricultural research for sustainable development not only in PNG but also in the Pacific. He represented PNG NARI on APAARI for 16 years, served as APAARI Chair for two years, and was a member of GFAR Steering Committee for several years. Dr Ghodake also served the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) for 10 years and was a member of CGIAR Fund Council for over 4 years.

APAARI is grateful for Dr Ghodake's contributions and wishes him and his family all the very best for his retired life with happiness, peace and good health.



Dr Bhag Mal, joins as Interim Executive Secretary, APAARI

Dr Bhag Mal has joined as Interim Executive Secretary, APAARI effective 1 January, 2017. Prior to this, he worked as Senior Consultant, APAARI for 6 years, South Asia Coordinator for 10 years and Senior Research Fellow for 4 years in Bioversity International. He also served the Indian Council of Agricultural Research (ICAR) in various positions as Head, Crop Improvement Division at IGFRI, Jhansi; National Coordinator for Underutilized Crops Programme at NBPGR, New Delhi; Assistant Director General (Food Crops; Seeds), ICAR, New Delhi; and Director, IGFRI, Jhansi.



Dr Bhag Mal had been the President of Indian Society of Range Management and Agroforestry and Indian Society of Plant Genetic Resources and Vice President of Indian Society of Genetics and Plant Breeding, Indian Society of Plant Genetic Resources and Indian Society of Plant Sciences. He

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Handing over/taking over the charge of the Executive Secretary, APAARI (seen in the picture (from left to right) are Drs Raghunath Ghodake (former Executive Secretary), Dr Suwit Chaikiattiyos (former Chairman) and Dr Bhag Mal (Interim Executive Secretary)

Forthcoming APAARI Meeting/Workshops

- APAARI Executive Committee (EC) Meeting at Bangkok in April 2017

Forthcoming International Conferences/Events

- Global Forum on Agricultural Research (GFAR) Steering Committee Meeting, Rome Italy, 8-9 February, 2017
- International Conference on Climate Change at Colombo, Sri Lanka, 16-17 February 2017
- The 3rd International Conference on Agricultural and Biological Sciences at Qiomdao, Shandong, 26-29 June 2017

APAARI Participation in other Fora/Meetings

- Dr. Raghunath Ghodake participated and presented paper on Conservation and Use of Genetic Resources through Implementation of Suwon Agrobiodiversity Framework and Partnerships in Asia and the Pacific in the 1st International Agrobiodiversity Congress (IAC), in New Delhi, India 6-9 November 2016.
- Dr. Bhag Mal chaired technical sessions and Dr. J.L. Karihaloo moderated panel discussion in the 1st International Agrobiodiversity Congress (IAC), in New Delhi, India 6-9 November 2016.



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Dr Bhag Mal, joins as Interim...

has been the Chief Editor of Indian Journal of Plant Genetic Resources and Bioversity-APO Newsletter. Dr Bhag Mal had been the Member Secretary, ICAR Scientific Panel on Plant Breeding (1988); Member, Central Sub-Committee on Notification and Release of Crop Varieties, Govt. of India (1995); Member, National Functional Committee on Plant Genetic Resources (2000-2007); Chairman, Expert Committee for Developing Guidelines for Management of Genetic Resources; Chairman, Quinquennial Review Team, All India Coordinated Project on Underutilized Crops; and Member, Quinquennial Review Team, All India Coordinated Project on Medicinal and Aromatic Plants.

At the international level, he had been Member of 4 Scientific Indian Delegations to USA, Italy and China; FAO Consultant; Session Chairman in International Conferences held in Australia, India and Thailand; Member of the International Organizing Committee/ Programme Committee of 7 International Symposia Conferences; Presented invited papers in the International Conferences held in UK, Malta, Argentina, Australia, Thailand, India, Malaysia and the Philippines. He also coordinated 4 international research projects, organized 8 regional/international training courses and also managed the activities of South Asia Network on Plant Genetic Resources (SANPGR) and Asian Fruit Genetic Resources Network (AFGRN).

He has been the recipient of merit certificates/prizes at all levels including Chancellor's Medal for being one of the two best students of all colleges of Agra University in B.Sc. (Ag.) Course and Dr Harbhajan Singh Memorial Award of Indian

Society of Plant Genetic Resources (ISPGR). Dr Bhag Mal has been a renowned plant breeder with 16 varieties of fodder crops, cereals and pulses; 155 research papers, 18 books/monographs and 24 book chapters to his credit.



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News Update from Regional Centers – SPC

if possible to PNG, or to the Fijian or Samoan sites. This project will also help in training young scientists in coconut breeding and conservation, and upgrading the capacity of the genebanks' staff. All the collected data will be registered under the Coconut Genetic Resources Database (CGRD) to be available for the international research community and all coconut stakeholders through COGENT facilities.

Mr Apaitia Macanawai said "How can we live without coconut? Coconut is about food and nutrient security and income generation for our people! This project is important to conserve our unique diversity for addressing global challenges". "Coconut is a tree of life and conserving unique diversity supported by innovative approaches and capacity building help to secure this important resource for food security in our country", said Mr Misa Konelio, Assistant Chief Executive Officer, Ministry of Agriculture, Samoa

(Source: Valerie S. Tuia, Genetic Resources, SPC valeriet@spc.int)

Executive Committee

<i>Chairman</i>	:	Dr Suwit Chaikiattiyos
<i>Vice-Chairman</i>	:	Dr Abul Kalam Azad
<i>Members</i>	:	Ms Mellisa Wood Dr Reynaldo Eborra Dr Hemantha Wijewardena Mr Jitendra Singh Dr Mark Holderness Mr Tony Simons Dr Muhammad Musa Ms Esther Penunia Ms Heidi Gallant
<i>Executive Secretary</i>	:	Dr Raghunath Ghodake

All queries relating to APAARI Newsletter be addressed to:

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