

Newsletter

Pathways to strengthened agri-food research and innovation systems in Asia and the Pacific



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Editorial

Reflection on 2019

The year 2019 came to an end – and what an exciting and successful year it's been for APAARI! The year started not only with diverse efforts to reform the Secretariat's administration, revision of our Constitution, applying for a legal status of APAARI in Thailand, membership management, but also with rich operations, cooperation and development of new projects, all envisioned to benefit our members. This Newsletter shares APAARI's activities and accomplishments achieved during the last six months.

On the administration side, APAARI has published an amendment to APAARI Constitution (seventh edition), and has continued the dialogue and pursue with Thailand's Ministry of Foreign Affairs for obtaining the legal status in the country. The Secretariat also strives to develop its management standards in various administrative areas, to improve the efficiency and effectiveness of our operations and services to members. With the appointment of a Finance Coordinator and new finance policies that have been drafted, APAARI's financial management is bound to improve. Management standards for membership, and performance review and development of APAARI staff, have recently been developed. The commitment we've made to our members and partners on Monitoring, Evaluation, Reporting and Learning (MERL) has been fulfilled, and all staff have been actively participating in implementing the MERL Plan.

At the same, APAARI has been involved in the mobilization of new members, nurturing existing partnerships, and developing new ones. The aim is to strengthen APAARI's membership and partnership base to bring Asia-Pacific institutions – particularly those from within national agricultural research systems (NARS) – under the regional agri-food knowledge umbrella to enhance agricultural innovation systems (AIS). As a result, five new members joined APAARI and a number of new projects have been developed and secured with new partners.

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EDITORIAL TEAM

- Ms. Martina Spisiakova
- Ms. Celilu Bitong
- Dr. Peter Horne
- Dr. Ravi Khetarpal

Our engagement with stakeholders particularly intensified with the South Asian Association for Regional Cooperation (SAARC) through APAARI's contribution to the development of the Ten-Year Multi-Sectoral Workplan for SAARC Agriculture Centre 2020-2030. Earlier this year, APAARI developed a project proposal entitled 'Asia Pesticide Residue Mitigation through the Promotion of Biopesticides and Enhancement of Trade Opportunities' together with Rutgers University, US and United States Department of Agriculture (USDA), which has recently been approved by the Standards and Trade Development Facility (STDF) of the World Trade Organization (WTO). Furthermore, APAARI has been selected as an important partner for two projects funded by the European Union (EU). The first one is the Agroecology and Safe food System Transitions (ASSET) in Southeast Asia, also funded by the French Development Agency (AFD), and led by the French Agricultural Research Centre for International Development (CIRAD).

The second project entitled 'Developing capacities in agricultural innovation systems (AIS): scaling up the Tropical Agriculture Platform (TAP) Framework', is a continuation of APAARI's partnership with the Food and Agricultural Organization of the United Nations (FAO). With FAO, APAARI has also recently successfully completed the testing of the FAO AIS Assessment Guidelines in Thailand that is being used as a model for conducting such assessments in other parts of Asia-Pacific, the next one in China. My recent selection as Vice-Chair of TAP at FAO for 2019-2021 shows even more commitment of APAARI towards these efforts.

Knowledge partnership with the Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GCHERA) has been strengthened through closer

collaboration in the area of agricultural education. APAARI has recently been nominated as a member of GCHERA's Steering Committee.

Despite the heavy workload on the above activities, APAARI has been focused on implementing its core activities, including the Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB), Agricultural Science and Technology Indicators (ASTI) Project, as well as the knowledge management (KM) programme that particularly aimed to strengthen agricultural education in the region. Not counting the numerous capacity development and knowledge sharing events, which APAARI either organized, co-organized or participated in, the year 2019 concluded with a successful Executive Committee Meeting (ECM) under the dynamic chairmanship of Dr. Peter Horne, General Manager, Country Programs, from the Australian Centre for International Agricultural Research (ACIAR).

This Newsletter provides highlights about these accomplishments, and I hope you enjoy reading this issue. As we close the year 2019, I would like to especially thank all APAARI members, donors and close partners for their continuous collaboration and contribution to the Association as the pillars of APAARI! This year, we are further committed to continue our support through knowledge sharing, capacity building and partnership development, to jointly contribute to the realization of the Sustainable Development Goals (SDGs).

On behalf of APAARI, I wish all our readers a Happy New Year!

Dr. Ravi Khetarpal
Executive Secretary, APAARI



HIGHLIGHTS FROM THE APAARI SECRETARIAT

The Executive Committee Meeting discusses APAARI's governance, operations and partnerships



2nd Executive Committee Meeting of 2019



Peter Horne from ACIAR is the new Chair of APAARI Executive Committee

The second meeting of the APAARI Executive Committee (EC) for 2019 was held on 7 November 2019 in Bangkok, Thailand, under the new Chairmanship of Dr. Peter Horne, General Manager, Country Programs, ACIAR. Twenty-nine participants attended the meeting, including EC members, special invitees and staff of the APAARI Secretariat.

The meeting focused on sharing and discussing the overall progress achieved by the Association during the second half of 2019. This includes the actions taken on recommendations of the past EC meeting; progress on APCoAB, ASTI and KM programmes; work plan for 2020 following the MERL Framework; update on the development of strategic partnerships; membership management; as well as administrative matters, including development of management standards and finance.

The members highlighted that in the context of the expansion of APAARI's activities as new projects have been secured, APAARI needs to better manage risks to enable the Association to move forward effectively. The EC appreciated the cooperation of the Government of Thailand in supporting APAARI in getting its legal status; and the current members and partners for their contribution to delivering on the Association's mandate, as well as facilitation of APAARI's financial security.

The EC members welcomed the establishment of the new Centre of Excellence (CoE) on Value Chains in National Chung Hsing University (NCHU), Taiwan, which now calls for the development of a medium-term strategy. The establishment of APAARI's sub-regional presence in the Pacific is in the pipeline, with current efforts to define its rationale, key partnerships and budget. The EC members noted that SDG17 – Partnerships – is the key SDG for APAARI, which is better placed than many other organizations to contribute to. Hence, this is an opportunity for APAARI to play to its strengths. In the context of the new projects being developed and secured, the EC members recommended that it is important that APAARI shares the lessons from these initiatives with all APAARI members, and

defines a process of developing new projects involving the members and aligning with APAARI's mandate.

Nine special invitees – new members, partners or potential members of APAARI – were invited to share their thoughts on planned collaborative areas with the Association. The guests included Dr. Ouk Makara, Director General, Cambodian Agricultural Research and Development Institute (CARDI), Cambodia, who confirmed CARDI's membership in APAARI from 2020; Dr. Wais Kabir, Executive Director, Krishi Gobeshona Foundation (KGF), Bangladesh, that envisions the exchange of best practices, research findings and policies through APAARI; Dr. M. B. Chetti, Vice-Chancellor, University of Agricultural Sciences (UAS), Dharwad, India; that particularly needs APAARI's support in building strong communication skills of students, scientists and extension workers; Dr. Kanokwan "May" Chodchoey, Executive Director, Asia-Pacific Seeds Association (APSA), that is interested to collaborate with APAARI particularly on phyto-sanitation, gene editing, CoE on supply and value chains, capacity building, and information exchange, to achieve a stronger impact on the seed sector; Dr. Tzong-Ru Lee, Professor of Marketing Department, NCHU, Taiwan, who stressed collaboration with APAARI through the CoE on Value Chains; Dr. Tooraj Valinasaab, Head of AREEO, Iran, who highlighted the upcoming regional workshop on Innovations in Vegetable Seed Productions Technology organized with APAARI in February 2020; Dr. Sanjay Saxena, General Manager and Head of Investments, Biotechnology Industry Research Assistance Council (BIRAC), India, that envisions APAARI to guide the Council's entrepreneurs and academia, and implement joint programmes; as well as Ms. Maria Elena V. Rebagay, Policy Advocacy Officer, Asian Farmers' Association for Sustainable Rural Development (AFA), that expects APAARI to support AFA's advocacy of farmer issues and popularize research outputs in local languages in the context of the decade for family farming.

The meeting concluded successfully with endorsed work plan for 2020.



The ASTI Project is concluding in 2020

ASTI, globally recognized as the authoritative source of agricultural research statistics and analyses for the developing world, is a programme of the International Food Policy Research Institute (IFPRI) covering 90 countries and spanning 30 decades of operation. From 2017-2019, ACIAR supported a two-year project in Southeast Asia and Pacific.

IFPRI entered into a strategic alliance with APAARI, to manage day-to-day operation of ASTI in Southeast Asia and the Pacific. The project aims to reduce the knowledge and information gap on the inputs, performance, and outcomes of agricultural research systems in ten countries in the region, and to build a solid foundation for the long-term

monitoring of agricultural research investment and capacity. In December 2017, ASTI trained ten focal points representing national agricultural research institutes (NARIs) from ten countries, namely: Cambodia, Fiji, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, PNG, Thailand and Vietnam. The training focused on survey instruments and data management systems. Since then, the focal points have been coordinating survey activities in each country.

In December 2019, eight of the ten countries, in which ACIAR-supported ASTI activities have taken place, completed data collection. Data has been processed, analyzed and a series of research publications are currently being developed with the focal points using the data. 400+ agencies were surveyed and detailed data were collected on



The ASTI Team: Norah Omot, Gert-Jan Stads, Ravi Khetarpal, Nguyen Thi Pham and Alenjandro Nin Pratt

human resources, investment, research focus and output. The publications will describe key trends, challenges, and policy implications emerging from the data.

All reports on national-level data will be made available on interactive country pages, benchmarking, and data download tools on the ASTI website, promoted through APAARI. In addition, four countries are implementing an analytical agenda, which focuses on transforming research results into stakeholder-friendly applications.

Once completed, the research outputs will be useful tools for R&D stakeholders particularly to: track progress toward agricultural development commitment and investment targets; identify key resource gaps and help mobilize required resources; and inform efforts to restructure and

reform national agricultural systems. ASTI is working with the focal points and NARS leaders to map policy impact pathways, outreach strategies, and exploring ways to embed ASTI-type data collection in NARIs.

The ASTI team visited the Socio-Economics and Research Division of the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD)/Development of the Department of Science and Technology (DOST) from 17-18 December 2019. The visit was part of the project activity to work with partners to check progress on the in-country survey of ASTI indicators. During the visit, a plan was developed with PCAARRD for completing the Philippines survey.

Read more: [ASTI](#)



APAARI contributes to the dialogue on food and agriculture in SIANI's Annual Meeting 2019

APAARI was invited to participate in the annual meeting of the Swedish International Agricultural Network (SIANI) held on 28 November 2019 in Bangkok, Thailand. SIANI is an open and inclusive network with a mission to facilitate, promote and engage in dialogue to support SDG2 (Zero Hunger). With over 300 members in the ASEAN region, SIANI seeks regional priorities related to food security, improved nutrition and promotion of sustainable agriculture. The meeting gathered a diverse group of stakeholders from academia, private sector, international organization and civil society, and provided opportunities for knowledge sharing and cross-fertilization of ideas related to food and agriculture.

Read more: [SIANI](#)



Global leaders of agricultural science and technology in Asia-Pacific meet at a global forum

Since 2006, the Chinese Academy of Agricultural Sciences (CAAS) has been organizing the Global Forum for Leaders of Agricultural Science & Technology (GLAST), together with FAO and CGIAR. GLAST gathers leaders in agricultural science and technology of countries, international organizations and the private sector, to share experience, study coping measures for major issues that hinder the development of global agricultural science and technology, and build a community that promotes cooperation for agricultural innovation in the region.

On 12-14 November 2019, CAAS hosted the 6th GLAST meeting focusing on 'Science and Technology for Green



*Signing of an agreement for international partnership
(Source: CAAS)*

Development of Agriculture and Rural Areas' in the context of the SDGs. The meeting took place in Chengdu, China, and was organized by the Chengdu Agricultural and Rural Bureau, and Sichuan Academy of Agricultural Sciences. In the presence of about 400 participants from around the world, the meeting discussed new thinking in the area of agricultural research and innovation, and presented models that promote the transformation agri-food development to support more effective, green and sustainable agriculture and food security. China's latest policies for agriculture and rural areas, including the latest initiatives aimed at poverty eradication, were presented as well.

APAARI was honored to take part in this important international platform to pursue win-win development of food and agriculture. Dr. Ravi Khetarpal made a presentation on 'Biosecurity Issues and Challenges due to the Transboundary Movement of Crop Pests in Asia-Pacific'. He also contributed to the panel discussion on 'Agricultural Players' Empowerment and Capacity Building' where he highlighted the role of APAARI in the context of its ongoing activities on AIS with FAO. Further, he signed an agreement with Dr. Xueping Zhou, Director General of Institute of Plant Protection, CAAS, for 'International Partnership for Cooperation on Transboundary Crop Pests Monitoring and Control'. A Chengdu Declaration was signed at the end of the Forum to formalize the commitments and partnerships in important areas of agricultural research, extension and development.

Read more: [The 6th Global Forum of Leaders for Agricultural Science and Technology \(GLAST-2019\)](#)



Methodological workshop for the new ASSET project takes place in Vietnam

The Agroecology and Safe food System Transitions (ASSET) in Southeast Asia is a new project funded by the EU and AFD, led by CIRAD in Vietnam, and to be implemented by over 30 partners, including APAARI, starting in 2020. The overall objective is to harness the potential of agroecology to transform food and agricultural systems into more sustainable systems, notably safer and inclusive, in Southeast Asia.

Specifically, the project will develop and promote a shared vision of the transitions towards agroecology and safe food systems at Southeast Asia through mobilizing the theory of change, strengthening and broadening the partnerships of the Agro-ecological Learning Alliance in SouthEast Asia (ALiSEA), as well as raising awareness and building capacity of a large public audience, including consumers, towards that shared vision. Building upon national AIS processes, the project will also support technical, organizational and institutional innovations and consolidate pathways towards bringing innovative approaches to scale.

APAARI will be leading the project sub-component on 'Promoting ASSET transitions through capacity development, communication and visibility actions, in partnership with the International Technology Centre (ITC) of Cambodia. The rationale is that widely harnessing the potential of ASSET entails a broad-based capacity development and outreach processes towards raising awareness and actions from diverse stakeholder groups. These groups include: (i) farming communities, service and input suppliers, and extension agents, as well as consumers and citizens to help shift agricultural and food practices, and demand for changes; (ii) researchers, professors and students to revisit agricultural and food research agendas and university curricula; (iii) policy makers to feed into policy development; and (iv) development practitioners for adapting their support to innovation processes.

As such, the ASSET Secretariat based in Hanoi, Vietnam, called for a methodological workshop from 18-20 November 2019. The meeting discussed the purpose and objectives of the project; built a common understanding on what agroecology and safe food system transitions are about; formulated a common vision for the project; presented and agreed on the different approaches to impact pathway development, theory of change, monitoring and evaluation, and the knowledge hub. All participants were actively involved in methodological discussions and operational framing in line with the project vision and key objectives. The meeting concluded with developing concrete ways forward that fed into the work plans of the different sub-components.

Read more: [ALiSEA](#)



Innovation and sustainability of agriculture: The topic of the IAAS annual meeting



Participants of the IAAS Annual Meeting

The International Association for Sustainable Agriculture (IAAS), School of Agricultural Resources of the Chulalongkorn University, and APAARI, met at the Chulalongkorn University, Bangkok, Thailand, on 9 November 2019. The occasion was IAAS' Annual Meeting focusing on innovation and sustainability of agriculture. Dr. Ravi Khetarpal presented the challenges faced by the Asia-Pacific region in the context of climate change, the increasing number of small farmers and their poor access to suitable technology. He also highlighted the importance of capacity building and partnerships in

strengthening agricultural value chain in Asia Pacific and shared the initiatives taken up for reinforcing APAARI-IAAS relationship.

Specialists, scholars and experts in the field of digital ecosystem, sustainability and blockchain from Russia, Singapore, Taiwan, Thailand and United States, shared their views on sustainability of value chain in the agriculture sector.

Read more: [IAAS](#)



Scientists trained in in vitro and cryopreservation approaches for conservation of plant genetic resources

The National Bureau of Plant Genetic Resources (NBPGR) of the Indian Council for Agricultural Research (ICAR) and Bioversity International, India Office, New Delhi, in collaboration with APAARI/APCoAB, organized an international training on 'In vitro and cryopreservation approaches for conservation of plant genetic resources'. The two-week course took place from 8-19 November 2019 at the Tissue Culture and Cryopreservation Unit (TCCU) of ICAR-NBPGR in New Delhi.

The TCCU was established to carry out research on in vitro conservation and cryopreservation of difficult-to-conserve crops and species, leading to the development of techniques for their short-, medium-, and long-term germplasm conservation in the In Vitro Genebank (IVGB) and Cryogenbank. The TCCU has been designated as a Centre of Excellence (CoE) in 2006 under the NBPGR-Bioversity International work plan, for undertaking international training programmes on in vitro conservation and



Laboratory training (Source: ICAR-NBPGR)

cryopreservation of plant genetic resources, to enhance the capacity of national programmes, especially in developing countries.

Twenty-two trainees from 13 countries participated in the training, including Africa (Algeria, Madagascar, Senegal), Central Asia (Uzbekistan, Kazakhstan), Europe (Ukraine), Asia (Bangladesh, India, Philippines, and Taiwan) and Pacific

Region (Fiji, Papua New Guinea, Samoa).

The training covered all aspects of in vitro and cryopreservation of germplasm, through 21 lectures and 14 practical sessions. These were delivered by national resource persons from NBPGR, as well as international experts from Royal Botanic Gardens, Kew, UK; Bioversity International; Mahidol University, Thailand; Dr Takao Niino (University of Tsukuba, Japan); and APAARI/APCoAB. In addition to the presented theory, the trainees acquired hands-on experience in handling vegetatively-propagated crops and difficult-to-conserve recalcitrant plant species. The trainees also visited the National Genebank and the National Herbarium of Cultivated Plants (NHCP), both housed within the ICAR-NBPGR Campus.

Over 93 per cent of trainees rated the course content, hands-on practical sessions and demonstration, as well as the expertise of faculty as excellent or very good. In addition to the newly-acquired knowledge, the participants appreciated the training as a platform for opening up new ways for collaboration with other institutes in other countries. It was also an opportunity for South-South Cooperation, as well as North-South collaboration in capacity development on biotechnology for conservation of plant genetic resource.

Read more: [Laboratory Manual for In-Vitro and Cryopreservation of PGR](#)



Precision agriculture and value chain disruption: An opportunity for sustainable development

From 5-7 November 2019, APAARI was privileged to attend the Precision Application Asia Conference in Bangkok, Thailand. Among almost all participants coming from the private sector, APAARI was a strong advocate for meeting the needs of small farmers and sustainable agriculture. Participants included manufacturers, formulators, distributors, and dealers of crop protection and plant health products; precision application (PA) technology companies providing inputs, artificial intelligence (AI), sensor technology, and data management/decision support tools for agriculture; and large grower co-op and food processing executives engaged in agronomic standards, farm management, and traceability, from all over Asia.

The event succeeded in exploring how PA is affecting the application of seed, fertilizers, water, and crop protection products, and how data is driving new application methods, including drones, variable-rate application, AI-powered spot application, and new formulations of crop inputs. APAARI participants have learned how and when new technologies are creating disruption of current value chains, and opportunities to capitalize on the evolution of agriculture that promotes more efficient and effective farming systems,

more profitable farmers, and better food security for the communities they serve.

APAARI was invited to a panel discussion and made a presentation on capacity building and partnerships in Asia-Pacific, highlighting the disruption's role in value chains in the context of small farmers and ongoing efforts towards the achievement of the SDGs. Dr. Ravi Khetarpal particularly stressed the key global advancements, with new technologies creating new industries to serve farmers, and new ways to assess crop value, access markets, generate more income, and establish more sustainable agronomic systems. He pointed out to the key challenges in Asia-Pacific agriculture that is dominated by small farmers. Firstly, climate change risks are looming large, and access to technology, particularly by small farmers, is often an issue. The region is home to countries with diverse state of economies, all requiring a tailored approach to agricultural innovation. Finally, and most importantly for technology adoption is that capacity building to enhance agricultural value chain is often not a focus.

APAARI has partnered with NCHU, Taiwan, to establish a Centre of Excellence on Value Chain that will provide capacity development and policy positioning on value chains in Asia-Pacific. It is envisioned to become a knowledge hub for agricultural value chains. Together with WTO, APAARI will also facilitate WTO compliances, branding, adding value to waste, understanding consumer and end-user preferences, through a new project – Asia Pesticide Residue Mitigation through the Promotion of Biopesticides and Enhancement of Trade Opportunities – to start in 2020. APAARI's participation in this event was therefore a great learning experience to feed into these ongoing initiatives.

The meeting was organized by Meister Media Worldwide – an agriculture-only business-to-business publisher for more than 80 years. Its eleven Branded Magazines, Websites, and Newsletters reach an audience of more than 200,000 each month, and their global event portfolio connects more than 4,500 business professionals each year.

Read more: [Precision Agriculture](#)



The GCHERA World Agriculture Prize Award: Attracting nominations of Asia-Pacific scientists

On 28 October 2019, Ms Martina Spisiakova, APAARI, attended the World Prize Award Ceremony of the Global Consortium of Higher Education and Research for Agriculture (GCHERA) and the 10th GCHERA Conference on Transforming Higher Education in Nanjing, China. The Prize of USD 100,000, generously sponsored by the Education Development Foundation of the Nanjing Agricultural University (NJAU) and Da Bei Nong Group in China, was awarded to Emeritus Professor José Miguel AGUILERA, a leading food engineer and food technologist from the

Pontificia Universidad Católica de Chile. Professor Aquilera earned the Award for his outstanding lifetime contribution in the fields of food engineering and food technology, and success in developing fruitful global collaborative partnerships with visible impacts on education and research in Chile.



International experts with the GCHERA World Agriculture Prize Award 2019 winner – Prof. Aguilera (in the middle)

What is the World Agriculture Prize?

The World Agriculture Prize is an annual international award of GCHERA aiming to promote the global development of the mission of its member institutions in education, research, innovation and outreach in the agricultural and life sciences. It recognizes the distinguished contribution of an individual to this mission. A nominee's achievements should be demonstrated locally and in the wider geographical region of the institutions in which the nominee has served, but not necessarily globally. The Prize is USD 100,000 per person and two recipients are normally awarded, with at least one recipient not coming from a country classified as having a developed economy. The selection process followed by the received nominations is led by a group of international experts.

The Prize was formally proposed by Prof. Zhai Huqu, the former Vice President of the Chinese Academy of Agricultural Sciences (CAAS) and Prof. Zhou Guanghong, the President of NJAU and Chairman of Educaon Professional Committee (EPC) of the Chinese Association of Agricultural Science Societies (CAASS) on 20 October 2012 in the occasion of NJAU's 110th anniversary. It was consequently approved at the GCHERA Steering Committee in Uruguay on 29 October 2012.

How can we attract more nominations from Asia-Pacific?

In 2019, APAARI became a member of GCHERA and its Steering Committee. It is therefore our duty and commitment to promote the World Agriculture Prize among our members and partners in the Asia-Pacific region that is so rich in agri-food research and science, and a home to many outstanding scientists, including many women. APAARI currently has 85 members, 31 per cent of which are higher education institutions. We feel the need to step up to our commitment to our members in the region by ensuring their visibility, sharing their innovations, and facilitating

their recognition for excellence in the area of food and agriculture at the global level. The next call for nominations will be announced early 2020, and APAARI will make special efforts to reach out to its scientific community to facilitate nominations for the 2020 World Agriculture Prize Awards.

10th GCHERA Conference on Transforming Higher Education in Nanjing, China

From 29-30 October 2019, thirty participants from higher education institutions (HEI) and various associations – GCHERA's members – from around the world attended the 10th GCHERA Conference on Transforming Higher Education hosted by NJAU in Nanjing, China. Asia-Pacific was represented by NJAU, China, and its various agricultural departments; University of the Philippines, Los Banos; and APAARI that represented all its member universities from the region. The meeting focused on sharing the cases for education transformation. Presentations were made by Dr. John Kennelly, Former President of GCHERA and Dr. Jose Zaglul, Rector Emeritus, EARTH University that has just been elected as GCHERA's new President. They talked about the new 'Transforming Higher Education Project' funded by the W. K. Kellogg Foundation, and the role of universities in producing ethical leaders. The President and CEO of the W. K. Kellogg Foundation – La June Montgomery Tabron – made a presentation on why the Foundation has decided to support this project.

The event also explored soft skills development in universities, particularly importance, trends, current initiatives and way forward. Presentations included research results on the soft skills required by employers; NEXTFOOD project – Transition to participatory and action-based education; employment problems facing university graduates in Africa; sustainable partnerships with universities in Asia; human resource development as the key to moving from excellence in research to development impacts; preparing graduates to be leaders in solving global environmental challenges; impacting food and nutrition security in Sub-Saharan Africa; student engagement; Purdue University's CATE programme; innovation in education at Chinese universities; Iowa State University and LaSalle University initiatives in transforming education; experiential learning in the Philippines; and the role of industry in transforming university education.

A special space was made for presenting the 'Transforming Higher Education Project', including the project overview, implementation arrangements, leading education reform at American University of Beirut (the project's implementing agency), the EARTH Education Model and the five key elements of success, transformation taking root at the Technological Institute Superior of Calkini, Mexico, and some testimonials from students.

Ms. Martina Spisiakova presented APAARI's model based on the AIS perspective as its main innovation strategy, highlighting the Association's work under TAP and ongoing

efforts to develop functional capacities (soft skills) to enable innovation of agri-food systems, particularly among national agricultural research system (NARS) organizations and HEIs in Asia-Pacific. The work with the Tamil Nadu Agricultural University (TNAU) was presented as an example of the model's application in higher education. APAARI also participated in a panel discussion with all represented associations. Some key challenges facing agricultural university transformation were highlighted, including the role of HEIs in agricultural extension, cultural barriers in engaging students, motivating professors to innovate education curricula, and interactions with government agencies and the industry.

Finally, APAARI would like to congratulate Dr. Jose Zaglul – the newly elected President of GCHERA – and it looks forward to working together in 2020 on making a difference in agricultural education.

Read more:

[GCHERA World Agriculture Prize 2019 Laureate](#)

[GCHERA World Agriculture Prize 2020 Nominations Open](#)



Youth as torchbearers for business-oriented agriculture in South India



Distinguished speakers during the workshop (Source: PJTSAU)

Professor Jayashankar Telangana State Agricultural University (PJTSAU), Hyderabad, India, hosted a two-day regional workshop on "Youth as Torchbearers for Business Oriented Agriculture in South India" - INSPIRE from 21-22 October 2019 in Hyderabad, India. It was jointly organized by the Trust for Advancement of Agricultural Sciences (TAAS), APAARI and National Academy of Agricultural Research Management (NAARM) of ICAR.

In addition to the technical content, the workshop attracted participants through a novel youth contest – IGNITE and an exhibition on "Potential Agri Enterprises". It attracted about 1,500 visitors, including college students, school children, faculty, and young farmers from nearby districts.

The workshop aimed to INSPIRE youth to – Ideate, Navigate, Skill, Perform, Innovate, Reach out and Engage their community to facilitate transformation of their farms into viable business enterprises.

The workshop provided a platform for over 500 participants, including 150 students, 75 faculty from different universities, 100 innovative farmers/agripreneurs from the South Indian States, as well as representatives of the industry and financial institutions to share knowledge and experiences concerning innovations, success stories on agri-entrepreneurship and opportunities for specialty modern farming. They discussed their constraints in executing innovative ideas and suggested measures to address them. The role of different institutions was explored as well, particularly with regard to technical, financial and policy support required for entrepreneurship. The workshop also explored opportunities for building a neutral platform for collaboration and partnerships in South India.

The event was inaugurated by the Honorable Governor of Telangana, Dr. Tamilisai SoundaraRajan, who urged universities to make the agricultural subjects more interesting and remunerative so that pre-college students opt for it as a first choice and not as the last option. The distinguished speakers emphasized the need for developing enterprises in food processing and value addition that are export oriented; harness the digital IOT technologies to foster large-scale agri-entrepreneurship, shift academic curriculum towards enterprise development, and build strong linkages with industry for nurturing creative minds.

Key recommendations that emerged from the sessions are summarized below. There is a need to:

- Build functional capacities of youth for commercial horticulture, niche farming, digital/precision farming, organic products sector, agro advisories, agricultural

extension, custom hiring farm machinery, food processing, IOT based agri innovations, as well as supply chain management, where there are ample opportunities for young people.

- Call for farmer collective friendly financing norms with emphasis on innovation of product and process, particularly rural innovations and non-farm sector.
- Promote change in mindsets and attitudes aligned to entrepreneurship both in faculty and students in agricultural and allied universities.
- Set up agricultural incubators in universities with experienced agribusiness professionals as mentors, offering vocational training and handholding services for rural and urban unemployed youth, students and faculty.
- Catch them young – incorporate agriculture as a subject in schools and agri entrepreneurship as part of curriculum of graduate studies in close collaboration with the industry.
- Develop IPR policy and research prioritization tending towards patentable innovations in technology in agricultural universities.
- Encourage faculty sabbatical in industry to build innovation ecosystem in universities.
- Ensure sustainability of agri enterprises after initial handholding by agricultural incubators through corpus funds.
- Include youth, especially women, in policy advocacy concerning agripreneurship.
- Launch a dedicated “National Mission on Youth in Agriculture”.
- Encourage rural innovation centres to organize more such workshops at the district level to empower rural youth.

The IGNITE Idea Contest saw the transformation of five young students from having ideas to winning the contest. Other participants carried away valuable take-home messages to improve their ideas.



International hands-on training on genome editing technologies

On 14-25 October 2019, Dr Rishi Tyagi, Coordinator of the APCoAB programme, APAARI, organized an international hands-on training on genome editing technologies in Hyderabad, India. Participants represented ICRISAT, BioNcube (DBT), and an ICRISAT-led Research Program on Grain Legumes and Dryland Cereals (RP-GLDC). Twenty-two participants representing NARS and the private sector from eleven countries, namely: Egypt, India, Kenya, Malaysia, Namibia, Philippines, Senegal, Taiwan, Thailand, Uganda, and Vietnam attended the training, 36 per cent of whom were women scientists involved in gene editing research. APAARI sponsored five trainees from Malaysia, Philippines, Taiwan, Thailand and Vietnam.

A comprehensive two-week schedule of the training

comprised both theory and practice. The trainees were exposed to laboratory practical exercises on various aspects of gene editing, including: bioinformatics tools to guide RNA designing; cloning of the guide RNA and Cas9 into the plant transformation vector; genetic transformation; confirmation of the recombinant clones by colony PCR; plasmid DNA isolation for the colony PCR positive colonies; agrobacterium transformation – electroporation; bacterial transformation for the gateway LR ligated reactions; demo arabidopsis/ tobacco transformation; functional characterization of gene-edited plants; surveyor assay/nano pore sequencing for identifying the indels in gene edited plants; as well as surveyor assay/nano pore sequencing data analysis.

Visits to the Centre for Cellular and Molecular Biology



Dr. Tyagi, APCoAB Coordinator, giving a talk to the trainees

(CCMB) and ICRISAT facilities, such as the Phenotyping Platform, and Centre of Excellence in Genomics and System Biology (CEGSB), were also arranged for the trainees. In addition to developing the capacities in gene editing research, the interaction among the trainees and between trainees and scientists of ICRISAT is envisioned to pave the path for the development of new partnerships and collaborative research programmes on gene editing at the regional level.

Read more: [International Hands-On Training on Genome Editing – Practical Manual](#)



Experts meet in India to discuss gene editing and its regulation

A Regional Expert Consultation on Gene Editing and its Regulation was held on 10-11 October 2019 at the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India. APAARI organized the consultation in the context of its APCoAB programme, in collaboration with ICRISAT, Council of Agriculture (COA) Taiwan, Federation of Seed Industry of India (FSII), and the ICRISAT-led Research Program on Grain Legumes and Dryland Cereals (RP-GLDC).

The objectives of the consultation were to: review the status of regulatory policies around gene editing across the globe particularly in Asia-Pacific countries; provide a platform to promote adoption of science-based predictable policies for regulating gene edited crops and breeds; provide a platform to discuss the impact of regulatory hurdles, delays and associated high cost on technology adoption; and discuss communication strategies and enabling policies for plant and animal breeding innovations.

A total of 110 participants from nine countries, Australia, India, Japan, Papua New Guinea, Philippines, Switzerland, Taiwan, Thailand and Vietnam, attended the first day of the workshop, and 70 participants participated in the capacity development on the following days. Participants included researchers and scientists, representatives of various public institutions and the private sector; FAO; CGIAR centres; as well as government departments and bodies, including the Department of Biotechnology, Ministry of Agriculture and Farmers' Welfare.

International experts presented the status and advances in gene editing, including its regulatory status; and the perceptions of gene editing by different stakeholders. The panel discussion focused on research priorities, capacity and infrastructure development, regulatory policy development, public awareness, and possible partnerships to achieve the SDGs. Key recommendations that emerged from the two-day deliberations and discussions are summarized below.



Participants of the Expert Consultation

Many governments are seeking to ensure that the regulation of genome-edited plants is commensurate with the potential risks of these plants to the environment, human or livestock safety. Some governments have already taken the position that gene edited plants with phenotypes that have been, or can be achieved using conventional plant breeding techniques (including mutagenesis techniques), should be subject only to those same regulations as their conventionally-bred counterparts, such as phytosanitary regulations and variety registration. Any regulatory oversight should be based on the final product rather than the process involved.

Therefore, it was recommended that consistency can be achieved by not regulating products of plant varieties developed through the latest breeding methods if they are similar or indistinguishable from varieties produced through earlier breeding methods. The genetic variation in the final product would not be regulated when it does not contain a novel combination of genetic material; the final plant product contains genetic material from sexually compatible plant species; or when any form of mutagenesis is involved. This will ensure that agricultural innovation can proceed unhindered for the benefit of farmers and society.

Developments in Asia-Pacific countries include Australia and Japan both excluding certain categories of gene editing products from the scope of GM regulation. Australia has expressly excluded all applications of SDN1; and Japan has excluded SDN1 on the basis that it does not involve the use of “extracellularly processed nucleic acids”. These exclusions are based on the basis of the technology being the natural cellular repair mechanism, non-homologous end joining.

In other regions, countries of Latin America (e.g. Argentina) have adopted approaches more aligned with the criteria listed above, and products developed using ODM, SDN1 and SDN2 have been exempted from GM regulatory requirements. Based on these criteria, only those products developed using SDN 3 that contain foreign DNA introduced from sexually incompatible species should be subjected to safety assessment on a case-by-case basis.

As is abundantly clear from the experience with regulation of GM plants across the globe, ambiguity in regulatory requirements causes unpredictable delays in approvals, thereby increasing costs, deterring innovation and restricting product pipelines. These costs have also effectively eliminated small- and medium-sized enterprises (SMEs) from being able to compete in this space. This has severely constrained the development and deployment of the GM crops that are important for food security or with traits that are relevant to smallholder agricultural systems. Science-based, predictable and proportionate regulations with clear timelines are urgently required to encourage innovations. It was recommended that countries should clarify the scope of their regulation for the products of gene editing at the earliest.

Should it be determined that a sub-set of gene-edited plants may warrant regulation as GM, then harmonization of approaches within Asia-Pacific is important for collaboration in research, capacity development, regulation and trade. Efforts towards common ground should be facilitated by organizing interactive meetings among researchers and regulatory agencies in the region, and should also be informed through appropriate stakeholder engagement.

Significant efforts are needed from all stakeholders to improve and prioritize communication and information exchange about gene editing, particularly focusing on how it is an extension of conventional plant breeding. Besides capacity and competency building in R&D, deployment and delivery of the products of gene editing should be enhanced at the regional level. Public-public and public-private partnerships should be encouraged. Better mechanisms for sharing knowledge and technology need to be in place to enable such partnerships. Regional organizations, such as APAARI should lead the development of network projects involving national partners in the interest of smallholder farmers and consumers of the region.

Crops, as well as areas of improvement, need to be prioritized for an efficient deployment of gene editing technology. The first applications of gene editing in the country can set precedents, and hence proactively establish effective policies. The innovative institutional arrangements, networks and collaboration will contribute substantially to the development of human capital needed to ensure the judicious application of these advanced tools and technologies in the region. Similarly, regional collaboration and networks can also contribute to capacity building, communication strategies, policy development and advocacy.



The 3rd Yushan Forum focus on deepening progressive partnerships in Asia



Dr. Khetarpal delivering a talk during the Forum

APAARI participated in the 3rd Yushan Forum: Asian Dialogue for Innovation and Progress organized by the Taiwan-Asia Exchange Foundation (TAEF) from 8-9 October 2019. Dr. Khetarpal presented the role of APAARI and its partnerships in sustainable agricultural development of

Asia-Pacific. The Forum is an important platform for Asian regional dialogue initiated by Taiwan, with the purpose of expanding multifaceted opportunities for cooperation and facilitating the exchange of ideas, talent, technologies and social initiatives. The event also aimed to deepen Taiwan's partnerships with Asian nations, leveraging the presence of diverse leaders, thinkers, innovators and youth from across Asia.



Scientists discuss microbial-based strategies for improvement of soil and plant health

APAARI participated in the 40th Annual Conference and National Symposium organized by the Indian Society of Mycology and Plant Pathology (ISMPP) from 24-26 September 2019 in Karnataka, India. The theme of this conference was 'Microbial-Based Strategies for Improvement of Soil and Plant Health'. The event gathered eminent speakers, scientists, research scholars and emerging graduates, who shared and discussed their views about agricultural challenges, especially those related to crops losses caused by plant diseases. It was an opportunity for industrialists and other stakeholders to share their ideas and solutions to address the current scenario. Dr. Ravi Khetarpal who is also the President of the ISMPP, presented phytosanitary measures on trade and related policies and practices in the region. He also highlighted risk mitigation strategies for plant, seed and germplasm, as well as the role of the private sector, regional bodies and international organization.



Testing the AIS Performance Guidelines in Thailand – The methodology applied by APAARI

Meeting the growing global demand for food in the context of changing climate, conflicts, crises and natural disasters and structural socio-economic change while protecting and preserving the natural resource base, requires major transformation of agri-food systems. A holistic, inclusive and system approach is needed, and should be deployed at an unprecedented speed and scale. The agricultural innovation system (AIS) approach is increasingly acknowledged as a key to improving the economic, environmental and social performance of the agri-food sector. However, accurate, reliable and timely data and information vital to effective decision making on the national AIS is hardly available.

In this context, APAARI is supporting the Food and Agriculture Organization of the United Nations (FAO) in testing the Guidelines for Assessing Agricultural Innovation System (AIS) in Thailand. The guidelines aim to assist member countries in undertaking a comprehensive diagnosis of their national AIS, in order to support the development of national agricultural innovation strategies.

The guidelines were developed in 2018 under the framework of the EU-funded Capacity Development for Agricultural Innovation Systems (CDAIS) project, by FAO, the French Agricultural Research Centre for International Development CIRAD, and other experts drawn from national, regional and international organizations.

APAARI was selected as the first institution to test the guidelines in Asia-Pacific, specifically in Thailand. As such, APAARI formed an assessment team consisting of its staff and consultants and led by the Executive Secretary. The team conducted a pre-assessment in the form of a scoping study, providing an overview of the agricultural sector, with major trends, challenges and opportunities supported by national indicators, as well as the status national AIS. Each team member volunteered to collect data related to different group of innovation actors that are part of Thailand's AIS. The data was then compiled and consolidated, which was integrated in a Country Report. The assessment also defined key issues facing the agricultural sector and AIS in Thailand, and specified the preliminary entry points for the assessment. The key tools used for the analysis were SWOT, stakeholder analysis, and policy mapping.

An inception workshop was organized with participation of policymakers, particularly from the Research and Development Division of the Department of Agriculture (DoA) and Department of Agricultural Extension (DoAE) under the Ministry of Agriculture and Cooperatives (MOAC), as well as the National Innovation Agency (NIA) under the Ministry of Higher Education, Science, Research and Innovation (MoHESRI). The prior literature review identified some key issues that were presented at this workshop. This led to the identification of main entry points that were further studied and validated through one-on-one interviews with various innovation actor groups, including: other government agencies (research and policy level), stakeholder platforms, higher education, farmer organizations and the private sector.

The assessment team used the framing questions provided in the guidelines, which were refined and adapted to better suit the target interviewees. Finally, based on the findings of the scoping study, inception workshop and one-on-one interviews, APAARI conducted structural and functional analysis, as well as the analysis of the enabling environment in Thailand. The structural analysis focused on system-level factors such as agency-structuration (e.g. actors, institutions, interactions and infrastructure), functions (e.g. knowledge development and diffusion, resource mobilization, guidance of the search for innovations, market formation, entrepreneurial activities and experimentation, and creation of legitimacy) and enabling environment to assess supporting policies and legal frameworks. The findings were ultimately consolidated into a Country Report that is being finalized by FAO, and will be shared with the APAARI Community in due course.

From 18-20 November 2019, FAO organized a Technical Workshop on Assessment Metrics for Agricultural Innovation Systems (AIS) and Extension and Advisory Services (EAS) in Rome. APAARI presented its work on AIS in Thailand during the workshop.

A similar assessment led by APAARI will take place in March 2020 in China, in collaboration with the Chinese Academy of Agricultural Sciences (CAAS). The objective is to identify the key structural, functional and enabling environment gaps of China's AIS and provide recommendations on strategies and priorities to address these gaps. The assessment will take place in one province of China, where in addition to the structural-functional-enabling environment assessment, a mapping of agricultural innovations will also take place

and an innovation profile for the province will be prepared. APAARI will train the CAAS Assessment Team in the use of the FAO AIS Assessment Guidelines, using a tailored and adaptive approach to address the specific needs of China's AIS.

Read more: [About AIS](#)

[CDAIS](#)

[Presentations made during the three-day workshop on Assessment Metrics for AIS and EAS](#)



The 5th Asia-Pacific Expert Consultation on Phytosanitary Measures takes place in Thailand

The Asia and Pacific Seed Association (APSA) organized its 5th Asia-Pacific Expert Consultation on Phytosanitary Measures with a theme: 'Strengthening Regional Cooperation to Ensure Seamless movement of Quality Seeds'. Dr. Rajvir Rathi, Chair of APSA's Standing Committee for International Trade, highlighted the importance of pest and disease-free seeds for both domestic and international supply chains. He also highlighted the current spread of the fall army worm (*Spodoptera frugiperda*) that is threatening the region. APSA's President, Mr. Tahir Saleemi, expressed the significance of Asia-Pacific region for international seed trade.

Dr. Ravi Khetarpal delivered his keynote speech and emphasized practical phytosanitary risk mitigation strategies at the regional and global scales, including the principles, policies and agreements related to germplasm exchange. He also clarified the distinction between plant and health, stating that: "Seed is a part of the plant and of phytosanitation. But all plant health issues are not found in

the seed". Further, he urged the seed industry to align their work with the SDGs.

The public-private forum was held on the 28-29 August 2019 and joined by more than 40 delegates from ten National Plant Protection Organizations (NPPOs), two Regional Seed Associations (RSAs) and seven National Seed Association (NSAs). Delegates from American Seed Trade Association (ASTA), International Seed Association, CropLife Asia, and Thailand's Department of Agriculture attended the consultation together with participants from Australia, China, France, India, Indonesia, Japan, Malaysia, Myanmar, Netherlands, New Zealand, Philippines, and the United States. Seed is the basic unit of agriculture, and the work of APSA is of great relevance to APAARI and its mission. As such, both APSA and APAARI agreed to explore opportunities to collaborate in certain areas of phyto-sanitation in the seed sector for the benefits of the region.

Read more: [APSA](#)



Participants of the Expert Consultation

Experts meet at a conference on climate change agricultural sustainable system and construction of circular economy

During the Conference held on 23 September, 2019 in Taipei, Taiwan, APAARI gave the key note speech on

'Challenges in Mitigating Impact of Climate Change to Agriculture in Asia and Pacific.' The speech highlighted that many Asia-Pacific countries are geographically vulnerable and highly exposed to the damaging impacts of climate change. Higher temperatures, sea level rise, and extreme

weather events linked to climate change are harming the region's economies, natural and physical assets, and cause the compounding developmental challenges, including poverty, food and energy security and health. Without climate-oriented development, climate change could force over 100 million people into extreme poverty by 2030. This is likely to wipe out the gains in poverty reduction being achieved over the last decades.

Southeast Asia is one of the world's most vulnerable regions to climate change due to its long coastlines, high concentration of population, economic activity in coastal areas, and heavy reliance on agriculture, natural resources and forestry. It is also speculated that the worst is yet to come at regional and global levels. The agriculture sector is in fact facing the dual challenge of increasing food production to meet increasing demands, while coping with the changing climate. Agriculture is also a key source and sink of greenhouse gas emissions.

The economics of climate change rests on the premise that climate change represents a major market failure where the costs of greenhouse gases (GHGs) emissions are not borne by those, who emit them. Climate change is a long-term threat with inter-generational implications, characterized by uncertainty and non-negligible risks of major, irreversible change.

Many countries in the region have specifically highlighted adaptation and mitigation measures in the sectors as priority actions for investment and scaling up. Access to timely and cost-effective data to inform measures for increased resilience and transformative adaptation in agriculture is a key barrier. From a mitigation perspective, finding ways to collect and monitor geospatial information on forest cover and degradation, crop yields and other parameters becomes important.

In recent years, scientists have developed a range of different models to monitor, evaluate and predict the effects of climate change. However, this information is often incomplete or focused exclusively on one scientific domain. FAO, in partnership with research institutes, developed the Modeling System for Agricultural Impacts of Climate Change (MOSAICC) – an innovative, inter-disciplinary and country-driven approach, as an ideal tool to carry out climate change impact assessment studies at the national level. The aim of MOSAICC is to build capacities of experts in countries to better understand potential impacts of climate change, and help policymakers with adaptation strategies, programmes, projects and investments. FAO is thus actively working with countries to enhance access of vulnerable smallholder farmers to climate information and disaster risk warning, using this information to adjust their production, diversify livelihoods and take early actions to be better prepared when emergencies happen. Further, to deal with the challenges and opportunities in tackling climate change, the agriculture and land-use sectors (comprising crops, livestock, fisheries, aquaculture and forestry) have been ensured to

feature prominently in Asian country nationally-determined contribution to the Paris Agreement.

Besides, given the huge losses foreseen in coming years due to the impact of climate change, it has become necessary to look at the concept of circular economy. The objective is to keep the value of products, materials and resources in the economy for as long as possible, and minimize waste generation. When it comes to implementing circular economy, it looks for the current – linear – model to "close the life-cycle" of products, services, waste, materials, water, and energy. This way, it strengthens sustainability and environmental preservation. There are challenges and opportunities in shifting from the linear model to a circular model and it may be explored in greater details to minimize the impact of climate change.



Agricultural innovation discussed in an international conference in Finland



International participants of the Conference

From 7-9 August 2019, APAARI co-organized and participated in the International Agriculture Innovation Conference (IAIC 2019) in Oulu, Finland. It was organized by the International Association for Agricultural Sustainability (IAAS), Singapore, in collaboration with the University of Oulu, Finland. Sixty participants from 25 countries attended this dynamic event focused on sharing knowledge and research on latest agricultural technologies and innovation processes to promote scaling up and collaboration. Asia-Pacific was represented by Bangladesh, China, New Zealand, Philippines, Singapore, Taiwan, Thailand, and APAARI that represented all its member countries from the region.

APAARI's host country – Thailand – presented government strategies for agricultural sustainability, the Thailand 4.0 policy, and pedagogical development for underprivileged students in Bangkok metropolitan administration schools. Taiwan shared its initiatives in digital marketing benefiting agricultural industry, and strategies to respond to climate change for agricultural products. Singapore focused on agribusiness succession and agricultural sustainability, while Bangladesh provided insights in the country's ongoing rural and urban development. China explored its innovative green development of its rural areas under rural revitalization, and New Zealand shared consumers' perceptions of biocide use

in the food industry.

APAARI's technical presentation made by Ms Martina Spisiakova emphasized the need to work from the AIS perspective whereas the system consists of a complex network of actors that together with supporting policies and institutions bring existing or new agricultural products, processes and practices into social and economic use. This was presented as APAARI's main innovation strategy, highlighting the Association's work under the TAP and ongoing efforts to develop functional capacities (soft skills) to enable innovation of agri-food systems, particularly among national agricultural research system (NARS) organizations and higher education institutions in Asia-Pacific.

Interesting research was presented by the host – Finland – including high-tech agricultural technology, its growing wild bilberry sector, hyperspectral imaging used in food quality control, the use of old mines to grow crops and crickets, and many other innovations emerging from the country's focused scientific research and unique technologies. The EU shared its model for international collaboration in Europe through the Agri-Food Smart Specialization platform.

University of Maryland and Eastern Michigan University, USA, presented innovative agriculture for human health and environmental sustainability and blockchains, respectively. Kristiania University College, Norway, offered their research on cleaner and sustainable food production through an aquaponics system; and Warsaw University of Life Sciences, Poland, highlighted their research on leadership, trust and knowledge management in innovative enterprises.

There are four specific implications for APAARI arising from this conference. IAAS is developing a project proposal to be submitted to the Ministry of Agriculture and Forests in Finland, planned to be implemented jointly with the University of Oulu, University of Maryland, APAARI, and Finish private sector. The Joint Research Centre of the European Commission based in Seville, Spain, identified APAARI as a key partner in scaling up its interregional collaboration model and bringing its Agri-Food Smart Specialization Platform to Asia-Pacific. The discussions on these opportunities for partnership are currently ongoing.

border trade. It also emphasized the strong logistics network and explored solutions and opportunities for using digital technology. Moreover, it featured a business-matching event by gathering logistic service providers and enterprises with the aim to create business opportunities, insights and connection growth. The forum was held from 24-25 July 2019 in Khon Kaen, Thailand.



APAARI contributes to SAARC's Multi-Sectoral Policy and Programme



Participants of the Expert Consultation

An expert consultation on the Multi-Sectoral Programme Development for the South Asian Association for Regional Cooperation (SAARC) Agriculture Centre took place in Dhaka, Bangladesh, from 14-18 July 2019. It brought together a group of experts to contribute ideas and experiences towards the development of a 10-year Multi-Sectoral Policy and Programme to be implemented by SAARC.

The experts assessed the current developments in agricultural research and innovations in the region, identified need-based demand-driven policies and programmes in agriculture and allied disciplines, and identified challenges, opportunities and priority areas in policies and programmes for agricultural R&D in the region.

APAARI co-funded the meeting by sponsoring six thematic experts from SAARC member countries to develop and present reports on crops, horticulture, natural resource management, livestock, fisheries, and agricultural policies from the region. Dr. Ravi Khetarpal and Dr. Norah Omot made two presentations namely, "strategies to develop the framework and multi-sectoral programmes across cross-cutting themes", and "Impact Pathway Assessment".

A book containing the thematic discussions is being published by SAARC and APAARI and is entitled Agricultural Policy and Program Framework – Priority Areas for Research & Development in South Asia.



Experts gather to discuss navigating non-tariff measures towards sustainable development

Dr. Ravi Khetarpal attended an Expert Group Meeting organized by The Economic and Social Commission for Asia and the Pacific (ESCAP) organized an Expert Group Meeting on 'Navigating Non-Tariff Measures (NTM) towards Sustainable Development' from 11-12 July 2019 in Bangkok, Thailand. The meeting was an opportunity to share knowledge and discuss the latest information and impacts on trade and investment in the use of NTM in the region.

The rise of non-tariff measures and its importance to sustainable development was the key topic, with other topics including: the increasing trend of NTMs; link between NTMs and the SDGs through a detailed methodology; importance of trade wars in the context of international trade; and examination of the NTMs vis-à-vis the SDGs.

It was highlighted that Sanitary and Phyto-Sanitary (SPS) measures, a common type of NTMs, is very costly specifically in the agriculture sector, and the only way to reduce the rate is compliance to international standards.

Dr. Ravi Khetarpal affirmed that there are still open-ended questions concerning the SPS Agreement due to economic indifference and lack of adoption of and compliance with international standards in the region. The main reason for not achieving compliance is the capacity of the region, with emphasis on the retention of human resource. Dr. Khetarpal suggested that an integrated approach to capacity development of SPS standards should function in the value chain process from input supplies to exporters, and not as an isolated or independent practice as is at the present.



Underutilized fish and marine genetic resources and their amelioration became a focus of a three-day regional workshop in Sri Lanka



Participants of the Regional Workshop

The Regional Workshop on Underutilized Fish and Marine Genetic Resources (FMGR) and their Amelioration was held on 10-12 July 2019 in Sri Lanka. APAARI organized the programme in the context of APCoAB, in partnership with the Sri Lanka Council of Agricultural Research and Policy (SLCARP), Council of Agriculture (COA), Taiwan, and National Aquatic Resource Research and Development Agency (NARA). A total of 94 participants from twelve Asia-Pacific countries, namely: Bhutan, Fiji, India, Iran, Lao PDR, Malaysia, Nepal, Philippines, Pakistan, Sri Lanka, Taiwan and Thailand, attended the workshop. They represented national research institutes, universities and research councils dealing with the management and conservation of underutilized FMGR. Thirty per cent of participants were scientists and researchers.

Mr. P. Harison, Hon'ble Minister of Agriculture, Rural Economic Affairs, Livestock Development, Irrigation and Fisheries and Aquatic Resources Development, Government of Sri Lanka, participated as a chief guest; and Mr. Dilip Wedaarakchchi, Hon'ble State Minister of the Ministry of Agriculture, Rural Economic Affairs, Irrigation and Fisheries and Aquatic Resources Development, Government of Sri Lanka, as a guest of honor.

International experts shared the background and status of underutilized FMGR in the region, as well as currently available technologies for conservation and utilization of these resources. This included access and benefit sharing, information system, as well as sponges and their potential uses and non-food uses of FMGR. The workshop was a combination of technical presentations and interactive discussions on regional priorities for underutilized FMGR in the following key areas: (i) conservation, improvement and use; (ii) value addition, marketing and export; (iii) biotechnology for enhancing utilization; (iv) partnership and capacity development; and (v) regional information-sharing system and focal points for the conservation and utilization of FMGR. Legal and policy framework support was discussed in a panel discussion. The recommendations from the meeting are summarized below.

Underutilized fish and marine genetic resources

It was recommended to apply genetic tools for identification and stock assessment of over-utilized marine species; implement regulations and policies to establish species-specific MSY; disseminate knowledge on sustainable utilization of FMGR among different stakeholders; identify

degraded fishing grounds and restore them; establish genome resource banks; apply biotechnological methods to promote aquaculture practices; and establish partnerships among countries within the regions to share knowledge and technical support.

Value addition, marketing, and export

It was recommended to introduce simple and cost effective methods and technology at household levels and improve infrastructure facilities to produce alternative value added food sources; improve and promote culture-based methods association with genetic tools to reduce the pressure on natural fishery resources and introduce alternative livelihoods; establish methods to gather and share data within the country and among the countries in the region; maintain regionally-accepted common standards for branding the products and initiate trade negotiations among countries to expand international markets.

Biotechnology for enhancing utilization

It was recommended to establish central germplasm banks to develop better breeding programmes through exchanging resources; develop captive breeding techniques incorporating genetic tools to establish selective breeding programmes; identify and establish suitable micro-propagation methods of selected seaweed types to enhance the seaweed farming; establish policies and regulations for an exchange of knowledge on biotechnology, techniques and resources among countries, in order to enhance the utilization and development of marine resources in the region.

Partnership and capacity building

It was recommended to establish an inter-governmental or regional cooperation body to assess the capacity building needs and gaps of the countries in the region and provide support for the development of national and international work plans for PCB; create regional economic partnerships to identify potential value of resources for utilization; create regionally-managed and funded programmes between countries to identify research capacities of regional partners; set up material transferring protocols (genetic or live samples) and repositories to facilitate safe custody of germplasm accessions and exchange for research; initiate PCB activities between countries for sharing water and genetic resources to harmonize policies on introduction of aliens/exchange of germplasm within and outside the region; and implement access to benefit-sharing of these programmes.

Regional information-sharing system and focal point

It was also recommended to enrich existing commodity-wise national database by including other relevant metadata on species in a standard format; develop mechanisms for information sharing in accordance to IPR and other national

laws; maintain a duplicate set of database preferably in more than one country; establish an administrator and expert committee of the focal point at country and regional levels to approve any additional information; and stimulate and coordinate the maintenance and further development of the databases (commodity wise) at country and regional level in a standard format.



Advancing technology for higher productivity and improved human health: The topic of SEAVEG 2019



The opening ceremony of the Symposium (Source: MARDI)

The Malaysian Agricultural Research and Development Institute (MARDI) and the Vegetable Science International Network (Veginet) organized the Southeast Asia Vegetable Symposium 2019 (SEAVEG 2019) from 9-11 July 2019 in Melaka, Malaysia. The event was co-organized by Lembaga Pertubuhan Paladang, Jabatan Pertanian, (Farmer Organization Authority), International Rice Research Institute (IRRI), Centre for Agriculture and Bioscience International (CABI), and supported by the Ministry of Agriculture and Agro-based Industry.

The theme of this year's conference was 'Advancing technology for higher productivity and better human health'. It highlighted the latest and advance technologies in producing vegetables and facilitated the exchange of ideas, interactions and collaboration about the latest innovation and products in vegetable farming.

APAARI co-organized the symposium, and with its recent work in value chains, it took the opportunity to host a parallel session on 'Addressing agricultural value chain towards achieving the Sustainable Development Goals in Asia-Pacific'. The session discussed issues and challenges in agricultural value chains with special reference to vegetable crops and commodities in the region.

Dr. Marco Wopereis, Director General, World Vegetable Centre, noted the importance of technologies to drive

agricultural production and enhance the efficiency of inputs of water, land, fertilizer and labour to further reduce post-harvest losses and carbon footprint. Dr Ravi Khetarpal, highlighted the recently-established CoE on Value Chain and the significance of the value chain in dealing with multi-stakeholder actors involved in agricultural production and consumption processes. Dr. Tzong-Ru Lee, NCHU, highlighted the significance of value chain analysis in determining the opportunities and weaknesses in the supply chain and offering solutions to improve profit and innovate to achieve sustainability.

Enabling farmers to tap value chain through technological inventions was presented by Dr. Amit Arora, Indian Institute of Technology (IITB) Bombay, with key points of creating value chains and strategies to reduce waste and increase farmers' incomes. Ms. Jennice Chen, IAAS Singapore, discussed ways to create the product value by using culture and healthy lifestyle, as well to reduce the existing information gap between producers and consumers. Lastly, Dr. Grisana Linwattana, Consultant (Government Relations), APAARI, talked about value chain in potato production in Thailand, particularly how the Government of Thailand managed to tackle the issues with low quality seed and high cost of production in collaboration with various stakeholders in the value chain.

An interactive session on challenges in value chain focused mainly on policy matters and a need for a KM platform for specific commodities. The need for emerging technologies and researchable agendas in various value chain components was underlined, as well as related market access and WTO trade compliances. The discussions led to the formulation of recommendations for APAARI intervention that will feed into the development of a policy positioning paper, collection of success stories and capacity building on quality standards in the region.

workshop. Thirty government officials and experts from the Asia-Pacific region also participated and engaged with youth in in-depth discussions and exchange of ideas about agribusiness innovation, and the use of digital technology to further benefit, raise value, and improve revenues in the agriculture sector.

The workshop focused on the challenges and opportunities faced by young agricultural entrepreneurs in starting new businesses, integrating digital technology in agricultural and rural development, and training and education for agribusiness entrepreneurship. Foreign lecturers introduced case studies on entrepreneurship promotion from Australia, Japan, and the United Kingdom.



NEWS UPDATE FROM NARS

Agricultural Research, Education & Extension Organization (AREEO)

Agro-Micro-Climatic Map of Iran



Unveiling the Agro-Micro-Climatic Map of Iran

The Iran Agro-Micro-Climatic Map was unveiled in August 2019 in Tehran. The map is a result of joint collaboration between the Soil and Water Research Institute (SWRI) affiliated to the Agricultural Research, Education and Extension Organization (AREEO) and the Iran Meteorological Organization (IMO). The map will be used for agriculture planning, which is dependent on regional climate conditions. In particular, it will be used for planting patterns and land suitability studies for agronomic and horticultural crops, and preventing abiotic stresses of plants like drought and chilling.

Agro-Micro-Climatic Maps are crucial to strategic decision-making and basic planning at the macro agricultural scale. The use of Agro-Microclimatic Map in preparation of crop pattern is very important. For example, the extraction of effective data in determination of plant phenology stages can improve the quality of policy making and zoning for crop pattern.

One of the features of this project is to make the maximum use of meteorological data available in the country, so



Participants of the Workshop

The Council of Agriculture (COA) and Agribusiness for Young Entrepreneurs (APO) organized a Workshop on Innovations in Agribusiness for Young Entrepreneurs on 1-5 July 2019 in China Productivity Center (CPC), New Taipei City, Taiwan. Participants from twelve countries, including students from seven countries recommended by APAARI, attended the

that all the data in the meteorological databases of Iran, including synoptic stations, rain gauges and climatology, as well as data of rainfall and evaporation station of the Ministry of Energy have been used for the last 15-year record intervals.

In order to conduct data quality control tests of homogeneity, the Regression-Kriging (RK) technique was used as the best interpolation based on estimation of accuracy statistics for zoning temperature and annual precipitation variables. Therefore, the temperature map with five classes (very cold, very hot, cold, warm and temperate); and the rainfall map with five classes (very dry, humid, dry, semi-arid and semi-humid) were prepared. By combining these two maps, the final map of agricultural climate of Iran was obtained through 24 different classes of precipitation and temperature. This map is produced on scale of 1: 2,000,000, and has a resolution of five km. In the last few years, greenhouse gas emissions and global warming have been rising, and floods, hailstorms, and storms have increased due to climate change. Now there is a possibility to integrate the agricultural climate map with the weather hazards for the agricultural sector. The plans are to collaborate further in this area, although climate change stipulations need to be updated every few years.

The determination of plant phonologic stages and climatic requirements for field and horticultural crops of the country, predicting potential and severity of pests and plant diseases, water resources management and irrigation requirements in plain and basin scale, as well as the preparation of land are the most important advantages of using this map.

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Ministry of Agriculture and Rural Development (MARD) – Vietnam

Overview of the impact of scientific research on agriculture and rural development in Vietnam

Over the past decade, the state investment in agricultural technology research and development (R&D) in Vietnam has reached a number of achievements. During 2005-2015, about 2.3 per cent of the total investment capital for the whole agriculture and rural development sector was equivalent to 13 per cent of the total budget for scientific research of the whole country. On average, the amount of investment for science and technology was VND 410 billion (USD 17.8 million) per year for 2005-2010, and VND 760 billion (USD 33 million) per year for 2011-2015.

Investment of the Ministry of Science and Technology (MST) for Vietnam Academy of Agricultural Sciences (VAAS), the

leading agricultural research institution during 2010-2019, was mainly through state-level research missions. During this period, VAAS has implemented 19 tasks to exploit and develop precious native plant species. During 2016-2019, VAAS has also implemented 16 state-level independent tasks on crop science and biotechnology. In general, investment in scientific research and technology transfer in Vietnam is still low, and has not approached the benchmark of the world as yet. As such, it has not been able to create breakthrough science and technology products.

Compared to international investment, the International Rice Research Institute (IRRI) invested USD 57 million in 2010, while MARD's total investment for science and technology was VND 839,890 billion (USD 36.5 million). If counting the expenses for agricultural extension (about VND 240 billion per year (USD 10.4 million) and development investment of about VND 160 billion per year (USD 7 million USD), the total investment for scientific research, technology transfer and development investment is nearly VND 1,250 billion per year (USD 54 million), which was lower than the investment for IRRI in 2010. According to the World Bank, Vietnam has invested in agricultural R&D equivalent to only 0.2% per cent of its agricultural GDP, while other countries, such as Brazil and China spent 1.8 per cent and 0.5 per cent respectively.



Dragon fruit tree in the Southern Horticultural Research Institute, Vietnam (Source: VAAS)

Over the past 10 years, 428 plant varieties have been created, selected and recognized as new varieties, and varieties for trial production. Out of these, 97 are officially recognized varieties (65 for rice, 25 for corn, 32 for bean, 14 for tuber plant, 21 for vegetables, 31 for fruit, 6 for tea, 6 for coffee, 14 for sugarcane, 2 for rubber, 8 for flowers, 2 for hybrid mulberry, and 7 for other plants); and 175 plant varieties were recognized for trial production.

Mostly, the new crop varieties are more productive than the demonstration varieties that are popularly produced in the fields or have valuable traits, such as high quality, pest resistance, or adaptation to unfavourable climate conditions. Agricultural scientists often recommend that the Government needs to increase investment in the

system of research units in the field of agriculture and rural development, upgrade the skills of human resources, and increase salaries of researchers.

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Read more:

Department of Science, Technology and Environment, Ministry of Agriculture and Rural Development, Report on the performance of tasks in 2018

Chris Jackson (WB) Agricultural Research in Vietnam Recent Trends and Emerging Challenges, 2015, Presented at APAARI Meeting in Bangkok, 2015.



Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) – Philippines

A new production system for citrus quality planting materials

The Nueva Vizcaya State University (NVSU) of the Philippines has established a production system for citrus quality planting materials (QPM) that can be readily accessed by citrus growers in the country.

The system includes a citrus mother tree foundation and budwood increase block, where trees are maintained in large earthen pots inside an insect-proof screenhouse. All mother trees are protected from two insect vectors: aphids for Citrus Tristeza Virus (CTV) and psyllids for Huanglongbing (HLB). CTV and HLB incidence, along with poor orchard management, are the main causes of low production of citrus in the country.

All mother trees are indexed for CTV and HLB annually to ensure that budwoods for seedling production in the nursery come from clean mother trees. The said trees have also been certified by the Department of Agriculture - Bureau of Plant Industry (DA-BPI) with tags indicating the true identity of the variety.

The production system for citrus QPM was developed through the project 'Establishment of quality planting materials production system for citrus in Nueva Vizcaya', funded by the Philippine Council for Agriculture, Aquatic and Natural Resources Research (PCAARRD) and Development

of the Department of Science and Technology (DOST). The project enhanced the nursery and screenhouse facilities of NVSU and increased capacity from 3,000-5,000 seedlings to over 7,000-10,000 seedlings per year.

Moreover, the indexing laboratory has become fully equipped with protein-based and molecular-based protocols. As a result, the laboratory has been used as a service facility for mother trees of NVSU's Philippine Citrus Resources Development Center (PCRDC), private orchards, and nurseries in the province.

The molecular-based detection for HLB involves the use of a probe that matches a sequence in the bacterial DNA (deoxyribonucleic acid). With positive detection, a polymerase chain product of 228 base pairs appears as a band. Disease detection for mother trees takes only 2-3 days.

Current efforts of NVSU on disease indexing through PCRDC are opening opportunities to provide services in the Cagayan Valley Region.

Through the project, PCRDC have developed the capacity of the local government unit of Kasibu, Nueva Vizcaya, in grafted citrus seedling production. The project provided



Mother trees and seedlings of different citrus species at Nueva Vizcaya State University's nursery and screenhouse facilities (Source: NVSU)

assistance to the Municipal Agriculture Office (MAGRO) by enhancing its screenhouse and linking them to NVSU's QPM system.

The development of the QPM system was an effort that progressed from the support of other government agencies that include the Bureau of Agricultural Research (BAR), Commission on Higher Education- Integrated Research Utilization Program, and Department of Labor and Employment- Adjustment Measures Program.

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Rural Development Administration (RDA) – Republic of Korea

Impact Report on the Food and Agriculture Cooperation Initiatives of RDA



Achievement of sustainable agriculture through the development and dissemination of agricultural technologies has been the overarching goal of the Asian Food and Agriculture Cooperation Initiative (AFACI) since its inauguration in 2009. AFACI an inter-governmental and multi-lateral cooperation body based at the International Technology Cooperation Center (ITCC), Rural Development Administration (RDA), Republic of Korea. It aims to improve food production, realize sustainable agriculture and enhance extension services of Asian countries by sharing knowledge and information on agricultural technology. With a vision of "Agricultural Cooperation in ONE", AFACI has established a network to support joint research and development initiatives, hence, transfer of technologies to stakeholders, more importantly farmers.

In a decade of the multilateral cooperation with RDA, AFACI has instituted a total of 16 projects implemented by its 14 member countries. Nine projects have already completed,

while seven are ongoing. In addition, three new projects will officially start in 2019, namely: (i) setting-up of soil map and information system; (ii) development of breeding technology for vegetable; and (iii) establishment of migratory pest control network.

This year, the Technology Cooperation Bureau of RDA published the 'Impact Report on the Food and Agriculture Cooperation Initiatives of RDA'. The booklet presented the social and economic impact reports reflecting the achievements delivered by the projects implemented by member countries of AFACI and the Korea-Africa Food and Agriculture Cooperation Initiative (KAFACI). It summarizes the effects and contribution of the developed technologies on the agricultural sector of the member countries.

In his message to the AFACI Community, Mr. Kim Kyeong-Kyu, RDA Administrator, stated that he looks forward to seeing better achievements generated in the next ten years. "RDA will work closely together with member countries to lay the foundation of agricultural development in member countries through multilateral cooperation initiative projects," he said.

For AFACI, Bangladesh, Bhutan, Cambodia, Indonesia, and Philippines are among the member countries featured in the book.

As technology awareness and adoption were fostered, farmers achieved significant increase in their production yield and income. Postharvest technologies minimized labor requirement, hence, there has been a reduction in production, harvest, and processing losses.

Phenotypic and genetic characterization for animals and germplasm collection for crops brought collective effort in the conservation of the genetic identity; and enhancement and improvement of the quality. Furthermore, livestock projects paved way to reduction in mortality. AFACI projects also included components for the production of crop manuals, crop calendars, and various information materials disseminated through trainings, seminars, and various forms of media. These extension services have developed additional skills and capacities of farmers, extension workers, and researchers.

In Bangladesh, upon application of postharvest technology in mango, the results revealed decreased postharvest losses from the recorded 28.1 per cent (before training) to 12.7 per cent (after training). This resulted in increased farmers' incomes.

Cambodia was able to publish 900 copies of manuals and 3,000 posters on postharvest handling technologies for chili, tomato, and mango. Regarding organic farming technologies, Bhutan shared that 70 per cent of households already adopted the technology. On the other hand, Indonesia noted an increase in revenue cost ratio from 1.7 per cent in non-organic to 3.5 per cent organic technologies.

The role of the Agricultural Technology Information Network in Asia (ATIN) has also been recognized as largely contributing to agricultural information dissemination and knowledge exchange. For example, the Philippines further strengthened the production and distribution of various information materials and crop calendars. RDA has been promoting R&D projects in collaboration with 45 countries in order to resolve agricultural issues by continent. These include 13 Asian countries, 20 African countries, and 12 Latin American countries.

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Read more: [Impact Report](#)



NEWS FROM HIGHER EDUCATION

Kamdhenu University, India

Enhancing university agricultural extension through farmer training on animal husbandry

In India, 70 million families are involved in milk production. Milk is therefore a major source of farmers' livelihood and their nutritional security. However, during the last two years, milk producers have been getting low prices for their produce. Due to the lack of financial support, they are unable to provide quality fodder to their animals, which ultimately affects the quality of their milk. In response to these issues, during the last six months, Kamdhenu University based in Gujarat, India, organized a series of interactive animal husbandry training programmes at Moti Adaraj, Chorivad, Ghadkan, and Dabhoda, Gujarat India. The training was part of the university's strong extension programme to support farmers with scientifically-based animal husbandry practices.

In total, the programmes trained about 1,150 dairy farmers, the majority of whom were women. At Moti Adaraj, where the training took place on 26 September 2019, Dr. N. H. Kelawala, Hon. Vice Chancellor, Kamdhenu University (KU) emphasized the need to work on breed improvement, balanced feed and improved hygiene. He also encouraged dairy farmers to pursue advanced animal husbandry practices to maximize their income and become self-reliant. At Chorivad and Ghadkan, where the programmes were held on 29 and 9 August 2019 respectively, Dr. P.H. Vataliya, Director of Extension Education, KU, underlined the importance of milk for human nutrition and acknowledged the vital role of dairy farmers in dairy development of the country. Dr. J. K. Patel, Deputy Manager, Sabar Dairy, advised and inspired the participating farmers to adopt organic animal husbandry practices and emphasized the importance of clean milk production. Finally, in Dabhoda, on 30 July 2019, Dr. P. H. Vataliya, proudly said that: "Today, women are successful representatives of the co-operative

dairy sector, which has been possible only because of the efforts of universities, state government, as well as these women that the sector engages". Dr. D.B. Patil, Director of Research, KU, advised the participants on how to deworm and feed mineral mixture to dairy animals. The training itself mainly focused on modern dairying, artificial insemination, ration balancing, as well as health, hygiene, and clean milk production to ensure good quality of milk.



NEWS FROM INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

International Centre for Integrated Mountain Development (ICIMOD)

Traditional food crops are key to the sustainability of socio-ecosystems in the Hindu Kush Himalaya

Agriculture is the main livelihood source in mountain areas of the Hindu Kush Himalaya (HKH). Traditional food crops, such as buckwheat, barley, sorghum, millets, amaranths, common kidney beans, black gram, horse gram, soybean and a mix of pulses make up a significant proportion of the dietary intake of mountain people. However, a gradual shift has taken place in recent years, with more people moving away from the cultivation and consumption of traditional crop varieties to newer ones. Traditional farming practices have also fallen by the wayside, with farmers adopting new farming techniques. This has weakened local food systems and increased dependence on external food grain sources. Although integration into the market system has increased mountain farmers' access to food through cash crops, it has made them more vulnerable to food and nutrition security due to frequent price shocks and disruptions in the transportation of food. Thus, it is important to conserve local



Harvesting Amaranths in Bajhang District, Nepal
(Source: Anju Pandit/ICIMOD)

food systems and agro-biodiversity for better livelihoods and nutrition security in the mountains. In this article, the three major sustainability aspects (social, ecological and economic) of traditional food crops are discussed to elaborate on their importance in the HKH.

In conventional terms, food choices have historically been

'limited' in most mountain areas of the HKH. Even when other grains are available for purchase, they are expensive and not everyone can afford them. Physical isolation has led to high dependency of farmers on traditional food crops for food and nutrition security. Although these crops are often referred to as 'poor man's food', they are rich in micronutrients, hardy, and suited to high-mountain environments.

These traditional food crops also have a big role to play in mitigating the impacts of climate uncertainties. They are less water consumptive, can grow well in marginal areas, have short growing periods, and are more resilient to climate-induced stresses. Since millennia, mountain farmers have promoted diversity in their farms to combat diseases



Kakuno, local variety of millet in Girkhella village, Bajhang District, Nepal (Source: Anju Pandit/ICIMOD)

and pests and to reduce crop vulnerabilities to climate fluctuations. The huge diversity also helps maintain the nutrient cycle and ensures better ecosystem health.

Presently, in many mountain communities, locally grown food does not meet household food requirements for the entire year. As a result, communities rely on external food sources to supplement their diets. Price shocks in food-producing areas and natural disasters, such as floods and landslides result in restricted food supplies and price hikes in the mountains. The promotion of traditional food crops through dedicated agricultural plans can make farmers food secure and self-sufficient, and protect them from price fluctuations.

Further, these crops have better energy use efficiency compared to other popular crops. They are also extremely nutritious, and are already socially and culturally accepted amongst mountain communities. They are key to strengthening mountain agrobiodiversity and promoting environmental sustainability through resilient farming systems. Provided that proper value chains are established, there is already huge global market for traditional food crops. In this regard, traditional food crops can go a long way in promoting economic sustainability in mountain regions.

They bring balance to local food systems and improve

farmers' incomes. As such, they must be endorsed and promoted in the HKH.

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Read more: [Are Traditional Food Crops Really 'Future Smart Foods?' A Sustainability Perspective](#)



International Crops Research Institute for Semi-Arid Tropics (ICRISAT)

Corporate Social Responsibility (CSR) Award for integrated watershed management in India

The President of India, Shri Ram Nath Kovind, recognized the Power Grid Corporation of India (POWERGRID) with the highest Corporate Social Responsibility (CSR) Award for improving the lives of nearly 30,000 farmers through an integrated watershed management project executed in partnership with the International Crops Research Institute for Semi-Arid Tropics (ICRISAT). On 29 October 2019, President Ram Nath Kovind and Ms Nirmala Sitharaman, Minister of Finance and Minister of Corporate Affairs, India, presented the National CSR Awards that seek to recognize outstanding efforts resulting in positive impact on the Indian society.

POWERGRID and ICRISAT initiated the project titled 'Improving Rural Livelihoods through Farmer Centric Integrated Watershed Management' in Andhra Pradesh and Karnataka states in 2014. In Ukkali village of Karnataka, the watershed programme has been focusing on improving water availability for around 10,000 residents and diversifying the livelihood systems by adopting an integrated water resource management approach.

"Nearly 150,000 m³ Rain Water Harvesting (RWH) capacity was created. Nearly 300,000 m³ runoff water has been harvested, facilitating groundwater recharge," said Dr. KH Anantha, Watershed Scientist at ICRISAT and the project's Principal Investigator in Karnataka. These efforts enabled about 500 hectares of additional area to be brought under supplemental irrigation with increased cropping intensity of 30-40 per cent.

Climate resilient crop varieties, balanced nutrient management, crop diversification and improved crop management helped achieve yield increases between 30-50 per cent. These efforts increased incomes by INR 10,000-50,000 (USD 140-704) per year per household. There has also been an increase in income of about INR 6,000 (USD 84) per family through livelihood opportunities created

specifically for women and the landless.

In ten villages of Andhra Pradesh, where 4,100 farm households were targeted in the watershed area, around 230 soil and water conservation structures were made. These have resulted in a net storage capacity of 200,000 m³ with a total conservation capacity of 500,000 m³. Around 20,000 farmers directly benefited from these efforts. According to Dr. Girish Chander, Soil Scientist at ICRISAT and the project's Principal Investigator in Andhra Pradesh, drought-related losses up to 30-60 per cent were mitigated.

Soil testing in select villages revealed deficiency of organic carbon (17-85 per cent), sulphur (36-100 per cent), zinc (58-100 per cent) and boron. Crop-specific fertilizer recommendations were then given. Further, around 1,000 demonstration plots were established to show benefits of improved cultivars, seed treatment, soil test-based fertilizer application that included micro and secondary nutrient application, and integrated pest management practices.

Consequently, productivity improvement of 10-50 per cent was reported for maize, pigeonpea, groundnut, foxtail millet and paddy. About INR 4,500 (USD 63) per hectare to INR 8,800 (USD 124) increase in income was reported.

To support women, small kitchen gardens or vegetable gardens were promoted. Other income generating activities including vermicomposting, vegetable kits, distribution of horticulture plants to self-help group (SHG) members, besides provision of a revolving fund, have been undertaken. The team introduced composting with crop residues. To increase value in pigeonpea farming, a mini mill was established, which also provides employment. Members of SHGs, who were engaged in goat rearing, have reported increased incomes of INR 4,000 (USD 57) in a year.

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Read more:

[Most prestigious CSR Award given for integrated watershed management](#)

[Putting drought behind: How a village in South India increased groundwater availability](#)



World Vegetable Center (WorldVeg)

Pesticide Troubles in Southeast Asia

Pesticide misuse is a widespread problem in vegetable production systems in Southeast Asia. Studies from the World Vegetable Center (WorldVeg) show the extent of the problem, identify drivers, and point at possible solutions. Strong action will be needed to reduce Southeast Asia's reliance on pesticides.



Chemical spray by hand (Source: WorldVeg)

The misuse of pesticides in agriculture (including overuse, incorrect use, as well as the use of obsolete products) is a problem the world over, and especially affects vegetable production systems in lower-income countries. Quantities of pesticide use per kilogram of harvested product are many times higher in most vegetables than in cereals. Unsafe practices of mixing, spraying and storing pesticides on the farm is dangerous to farm workers and their families. Consumers are affected by unsafe amounts of pesticide residues on the vegetables they buy and eat. The environmental consequences of pesticide misuse include poor soil health, surface and groundwater pollution, and the killing of beneficial insects, birds and aquatic animals.

Three recent papers authored by WorldVeg staff and partners document the scope of the pesticide problem in vegetable systems of Southeast Asia. The Federal Ministry of Economic Cooperation and Development of Germany, and other core donors to the Center, funded the research. The research confirms that the use of agricultural pesticides in Southeast Asia has skyrocketed during the last 20 years. Pesticides have become so easily available that a pesticide retailer can nowadays be found in nearly every village in



Chemical spray by machine (Source: WorldVeg)

Thailand and Vietnam. These two countries have recorded growth in agricultural pesticide use of 7-10 per cent annually over more than ten years. Levels of pesticide use are much lower in Cambodia and Lao People's Democratic Republic (PDR), but these countries appear to be catching up quickly.

The research collected primary data by interviewing 1,000 farmers producing yard-long bean and leafy brassicas in

Cambodia, Lao PDR and Vietnam. These data show that:

- 59 per cent of vegetable farmers in Lao PDR, 73 per cent in Cambodia, and 100 per cent in Vietnam overused pesticides—meaning that they used more than what is economically optimal. On average, 77 per cent of farmers' pesticide expenditure was unnecessary.
- Farmers seeking crop protection advice from pesticide shops spent on average 251 per cent more on pesticides than other farmers.
- Pesticide expenditures were 42 per cent less when a woman was in charge of pest management than when a man made the decisions.
- Farmers using biopesticides spent on average 31 per cent less on pesticides.
- Farmers were generally unable to distinguish beneficial insects from insect pests, but those who were better able to do this bought fewer pesticides.

"These results clearly show that farmers in Southeast Asia spray excessive amounts of pesticides," explained Dr. Pepijn Schreinemachers, WorldVeg Flagship Leader for Enabling Impact and lead scientist for the studies. "The good news is that farmers could earn a lot more by drastically reducing their pesticide use."

Improving the situation will require "carrots and sticks"—incentives and deterrents. In terms of "carrots," vegetable markets need distinct channels for safe vegetables so that consumers have a choice and farmers can receive a price premium for quality products. Better availability of and access to biocontrol products, such as biopesticides is also important. This requires research, as well as regulatory reform and perhaps incentives, such as subsidies. Extension systems also need to pay greater attention to promoting safe methods of vegetable production. Important "sticks" would include restricting access to the most problematic pesticides and fining traders, who sell unsafe vegetables, both of which require strengthening agencies' capacity for monitoring and enforcement.

Most farmers are aware of the problem of pesticides, but often have limited knowledge of alternatives or feel they have no choice. The health effects of pesticide exposure are mostly long-term, while the farm needs to generate profit on the short-term to fulfill family needs. With continued support from the Federal Ministry of Economic Cooperation and Development, WorldVeg and partners in Cambodia and Lao PDR—East-West Seed Foundation, International Development Enterprises, Department of Agriculture (Lao PDR), and the General Directorate of Agriculture (Cambodia)—will train 15,000 vegetable farmers in Cambodia and Lao PDR in integrated pest management and good agricultural practices over the next three years, particularly targeting off-season production when market prices are more favorable. Such large-scale interventions are important to reduce Southeast Asia's troubles with pesticides.

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Read more:

[Too much to handle? Pesticide dependence of smallholder vegetable farmers in Southeast Asia](#)

[How much is too much? Quantifying pesticide overuse in vegetable production in Southeast Asia](#)

[Safe and sustainable crop protection in Southeast Asia: Status, challenges and policy options](#)



International Potato Centre (CIP)

[Tapping sweetpotato's potential to improve farmer incomes and resilience in India](#)



By the end of 2017, farm productivity among participating farmers had increased by 17%

Though Odisha is India's top sweet potato-producing state, most farmers grow low-yielding varieties of limited nutritional value. The Odisha Directorate of Horticulture and the International Potato Center (CIP) spent four years promoting improved varieties and good agricultural practices in four districts of Odisha, resulting in a 25 per cent growth in the area dedicated to the crop, a 17 per cent increase in farm productivity, and a 40 per cent increase in farmer incomes within the project areas; as well as the introduction of a nutritious, orange-fleshed sweet potato variety. The project directly and indirectly benefited approximately 6,000 people, and developed a scalable approach that combines farmer capacity development with demand creation, which has potential for reducing hunger, malnutrition and poverty while boosting farmers' resilience.

Sweet potato has great potential for improving the incomes, diets and resilience of smallholder families in Odisha—the state that produces more of that root crop than any other in India, but in which most farmers grow low-yielding varieties with few inputs. The International Potato Center (CIP) and

the Odisha Directorate of Horticulture spent four years promoting sweetpotato and improving production in four districts of Odisha, and the results bode well for scaling the approach across the state.

Challenges

“Sweetpotato was once considered a poor man’s crop here, but now it is considered a rich man’s crop,” said Dr Sreekanth Attaluri, a project manager with CIP. Perceptions of sweet potato in India began changing when government officials grew aware of its climate resilience. In 2013, Cyclone Phailin battered India’s eastern coast, destroying much of Odisha’s crops and raising the spectre of hunger. However, most sweet potato fields survived, so farmers dug up those roots in the days following the storm, saving tens of thousands from hunger.

Indian officials decided to promote sweet potato cultivation in Odisha and the Government of India signed an agreement with CIP in 2013 to lead a four-year project called Generating Advances in Incomes and Nutrition through Sweet potato (GAINS). Funded by India’s Ministry of Agriculture and Farmers’ Welfare, and managed by the Government of Odisha, the project partnered with CIP and the Odisha Directorate of Horticulture, with participation of the Indian Council of Agricultural Research (ICAR). Together, they launched an integrated intervention to help farmers produce more sweet potatoes while promoting the crop’s consumption among the general population in four Odisha districts: Ganjam, Dhenkanal, Koraput and Sundargarh.



CIP used religious stories that mention sweetpotato to generate interest in the crop

Initiatives and interventions

Capacity development played a central role in the project, which provided training for more than 2,000 farmers and government technicians between 2013 and 2017. This included workshops and group visits to agricultural universities, farms and processing plants, but most of the learning was through field training in the communities.

To raise interest in the crop and inspire farmers to grow it, Attaluri and his colleagues also organized “street theatre” presentations of religious stories that included references

to sweet potato. “Sweet potato has a lot of significance in the Hindu religion, especially in Odisha” said Attaluri, who explained that it is mentioned in religious texts and is traditionally eaten during pilgrimages. He added that, in addition to the theatrical presentation, the project produced posters, training manuals and murals. An early priority was to expand the production and distribution of quality planting material for improved sweet potato varieties, primarily high-yielding Kanjangad and nutritious, orange-fleshed Bidhan Jyoti. Orange-fleshed sweet potatoes are rich in beta-carotene, which the body converts to vitamin A, so feeding them to children can reduce the risk of childhood blindness and other ailments caused by vitamin A deficiency.

Demonstration blocks were set up in communities where training in vine multiplication and good agricultural practices was offered. Training was tailored to the knowledge and needs of farmers in different areas, since commercial production is more common in Ganjam and Dhenkanal districts, whereas the hilly Koraput and Sundargarh districts are predominantly home to tribes that mainly grow sweet potato for local consumption. While the principal focus of training was agronomic, farmers also gained soft skills such as strategies for getting better market prices. They learned to grade their sweet potatoes to sell them for different prices, negotiate with middlemen, and combine their harvests and hire trucks to avoid middlemen altogether.

Attaluri lamented that it was challenging to get women to attend trainings – they represented just 15-30 per cent of participants, depending on the community. This was despite the fact that the project encouraged women to come and bring their children. Most women participants owned or leased farmland. To ensure that all participants benefited from capacity development, training session attendance was made a prerequisite for receiving fertilizer and other project subsidies.

Most field trainings took place during the planting season, when subjects covered included fertilizer application, pest control and other agronomic practices, or during the harvest season, when the focus was on post harvest options. CIP also facilitated value chain development that included sweet potato’s introduction into school lunch programmes and a mobile kitchen in which chefs demonstrated recipes for incorporating sweet potato into popular Indian dishes, to catalyse greater demand for the crop. CIP also introduced processing equipment and facilitated the formation of community groups to produce sweet potato chips or puree, which can be substituted for some of the flour in baked goods. Attaluri noted that those groups were dominated by younger farmers. “The youth want to try something new. They want to connect with new markets,” he said.

Main outputs/outcomes

The combination of improved varieties, agronomic training, value-added options and efforts to raise consumer awareness of sweet potato’s culinary and nutritional

attributes reaped positive results for approximately 6,000 farmers who benefited directly or indirectly from project activities. By the project's completion in late 2017, the area dedicated to sweet potato had grown by 25 per cent, farmer productivity had increased by 17 per cent, and farmers' incomes had improved by 40 per cent.

Impact

As a testament to the project's success, the Government of India approved a second phase of GAINS in 2018. That phase will replicate Phase I's actions in four additional districts, while placing greater emphasis on women's participation, nutrition education and the cultivation of the orange-fleshed Bidhan Jyoti variety, in an effort to reduce the incidence of vitamin A deficiency. Though GAINS I was only active in four of Odisha's 30 districts, it established a scalable approach that can be used to advance progress toward SDGs 1, 2 and 3 in the rest of the state while increasing farmer resilience under climate change.

Lessons learned

Because sweet potato farmers plant vines rather than seeds, it is important that efforts to promote the crop begin with the establishment of vine production capacity. At one point in the project, demand for sweet potato planting material exceeded the supply. Mechanization of the planting process can decrease production costs on larger farms, because the tasks of moving soil into ridges and cutting vines into pieces, are labour intensive, and farm labour is expensive at the start of the monsoon. CIP thus recommended that farmers rent tractors and contracted the development of a vine-cutting machine to reduce farmer costs.

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NEW MEMBER – PROFILE

Krishi Gobeshona Foundation



The Krishi Gobeshona Foundation (KGF) represents institutional innovation for agricultural R&D in Bangladesh. It was established with the sponsorship of the Government of Bangladesh and started its operations in 2008. It provides sustainable funding, ensures competitive research environment and operates a common platform for public and private organizations, including NGOs, to work in a pluralistic approach for agricultural R&D. Through this approach, it addresses demand-driven priority research issues in agriculture to promote higher productivity, nutritional security and improved livelihoods. KGF's vision is to foster an enabling environment for promoting quality agricultural R&D and capacity enhancement for sustaining agricultural productivity, farm income, and nutritional security.

KGF is governed by its Board of Directors elected by its General Body Members – agricultural experts from Bangladesh – and led by its Executive Director, who is also the Chief Executive Officer (CEO) of the Foundation. The sustainable funding of KGF comes from the profits of an Endowment Fund created by the Government of Bangladesh, and administered through an esteemed body called Bangladesh Krishi Gobeshona Endowment Trust (BKGET). BKGET is managed by a Board of Trustees consisting of senior-level government and non-government personnel, and headed by the Secretary, Ministry of Agriculture



One of the KGF's training programmes on 'Marker Assisted Selection' (Source: KGF)

(MoA), Government of Bangladesh. KGF operates various programmes covering crops, livestock, fisheries, natural resources, agroforestry, value chains, as well as cross-cutting issues, such as climate change and gender. The KGF programmes are mainly categorized as: (i) Competitive Grants Program (CGP), (ii) Basic Research Program, (iii) Commissioned Research Program (CRP), (iv) Capacity Enhancement Program (CEP), (v) International Collaboration Program (ICP); and (vi) Technology Piloting Programs (TPP).

At present, KGF is also taking into account the national agricultural policy, the Seventh Five-Year Plan, SDGs, and contemporary emerging issues that are impacting agriculture. It disseminates research outputs to a wide range of stakeholders through piloting, demonstration and media, with support of extension providers for wider adoption. KGF also organizes knowledge-sharing events on agricultural R&D.

In its first decade of operations, KGF helped to scale up technologies from a number of research projects, filling the gap between technology generation and large-scale adoption by farmers. There are tangible outcomes in terms of technology generation, adoption of successful agricultural technologies and capacity building through different research projects of KGF, demonstrating scientific, institutional and social impacts. A total of 57 research projects are ongoing under KGF funding and in collaboration with partner organizations, while about 128 projects have already been completed since KGF's establishment.

KGF realizes the needs for new ways of adaptation and research in agriculture to ensure food and nutritional security for the growing population in Bangladesh, in the context of decreasing cultivable land areas. KGF is also concerned about the consequences of climate change and its potential threat to agriculture that might further exacerbate the situation in the country. In addition, the increasing shortage of agricultural laborer is adding to the country's complexity.

KGF plans to address the issues, such as productivity enhancement of agricultural commodities, efficiency in natural resources management and creation of an enabling environment for agro-based job market. Combating antimicrobial resistance (AMR) that requires "One Health" approach involving animal, fish, human, and ecology health is also on the priority agenda of the Foundation. Emerging frontier sciences, such as nanotechnology, remote sensing, genetic engineering, food safety and quality improvement, agricultural mechanization, value addition, and policy, are also among the promising areas of research where KGF intends to invest further. Empowering women together with women-friendly technology generation in the agricultural sector is also being pursued by to ensure food security, nutritional improvement and poverty alleviation in the country.

KGF intends to continue its efforts with the involvement of public and private organizations, and universities to pursue R&D activities related to:

- strategic research to address climate change and develop climate-resilient agriculture
- addressing production constraints through cutting edge science (e.g. nano technology, genetic engineering, stress breeding, remote sensing)
- development of technologies for a greater involvement of women in agriculture
- development of an incubation hub for promising agricultural technologies a part of entrepreneurship development
- development of an information center for collecting socio-economic data on crops, livestock, fisheries, and forestry for analysis and reporting on policy-related issues
- development of strategic policy guidelines through

evidence-based research

- knowledge and skill development of the scientific community to enhance institutional capacity for pursuing research in a sustainable manner and ensure national priorities.

To better address the challenges of the agricultural R&D system and support food security of 250 million people in Bangladesh by 2041, KGF will require increased funding to pursue its research agenda in diverse areas. The limited BKGET fund generated from the proceeds of the Endowment Fund will be insufficient to finance the emerging research needs. Under these circumstances, KGF will highly welcome continuous donor assistance.

KGF is open to work with national and international donor agencies and research centres in the emerging areas of research. It also works through co-financing and collaborative arrangements. ACIAR is already engaged with KGF through the implementation of three research projects. KGF will explore donors, and more such collaboration through joint financing for strengthening research initiatives and sharing of research experiences. KGF is now also closely linked with the mainstream research through the Bangladesh Agricultural Research Council (BARC). It is connecting with international and regional bodies, such as APAARI, ICIMOD, and the Indian Society of Coastal Agricultural Research to expand its horizon for agricultural R&D in Bangladesh.



NEW APPOINTMENTS

Ritesh Dass, Permanent Secretary for Agriculture, Ministry of Agriculture and Fisheries (MAF), Fiji



Mr. Ritesh Dass joined the Ministry of Agriculture and Fisheries in Fiji in October 2019. He earned his Bachelor of Science from the University of the South Pacific, Fiji, and a Graduate Diploma of Management from the Central Queensland University, Australia.

He has extensive 22-year experience serving in multiple strategic roles with British American Tobacco, and has worked in Fiji, Solomon Islands and New Zealand. He was CEO for British American Tobacco in Solomon Islands and Fiji for nine years before joining MAF.



Dr. Chay Bounphanousay, Director General, National Agriculture and Forestry Research Institute (NAFRI), Lao PDR



Dr. Chay Bounphanousay has served the National Agricultural and Forestry Research Institute (NAFRI), Lao PDR, as the new Director General since 10 June 2019. She earned her BSc and MSc in Biology (Molecular Genetics) at Odessa University, Ukraine, and completed her PhD in Agronomy (Genetic and Plant Breeding)

in Khon Kaen University, Thailand. She has worked in the government as Senior Research Assistant and Associate Coordinator on rice biodiversity and farm conservation projects with Lao's Department of Agriculture, SEARICE, Chiang Mai University, Oxfam and McKnight Foundation in Thailand.

She also led a project on commercial rice cultivar improvement, and regeneration and safety duplication of rice in her country, with funding from the Lao Agricultural Research Fund (LARF) and in collaboration with IRRI, Japan International Research Center for Agricultural Sciences (JIRCAS), Kasetsart University, and Global Crop Diversity Trust (GCDT). Since 2012, she has coordinated Lao's lowland cropping system and Cambodia projects. She later became Director of Agricultural Research Centre (ARC) and Rice Research Program, as well as Deputy Director General of NAFRI in 2016.

Dr. Chay has been recognized as an Outstanding Scientist of NAFRI in 2009, 2014 and 2019, and also received an Outstanding Alumni IRRI Award at the 4th International Rice Congress in 2014. Some of her major scientific contributions include: establishment of national gene bank, rice germplasm collection, characterization/evaluation of rice germplasm, and contribution to the release of ten new improved rice varieties in Lao PDR.

capacities including as Professor and Head of Genetics and Plant Breeding, Research Scientist for sugarcane and castor, Principal and Dean, Registrar, as well as Director of Research and Dean of post-graduate studies at JAU. Since October 2019, Dr. Chovatia has taken up the duties of Vice Chancellor at JAU. He has received more than ten awards and appreciations from various organizations, and published 90 publications, six papers in international journals, and 27 in national journals.

Dr. Chovatia has contributed to the development of more than 60 technologies, and fourteen new varieties of different crops. He also contributed to seven variety releases and over 60 recommendations. Among his other achievements is the coordination of about 150 university research projects, establishment and development of a new Agricultural College at Amreli, Gujarat, and guidance of 15 M.Sc. (Agri) and four Ph.D. students. Under his leadership, the World Bank-funded National Agricultural Higher Education Project (NAHEP) has awarded a budget worth INR 3,000 lakh (USD 4.2 million) to JAU in the context of its Institutional Development Plan.



Dr. Kernel Singh, Vice Chancellor, Risam Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST) India



Dr. Risam is the new Vice-Chancellor of Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST of Jammu), appointed in March 2019. He earned his Bachelor of Veterinary and Animal Sciences from University of Udaipur, India, and Master of Veterinary Sciences, Animal Breeding and Genetics

from Sukhadia University, India. He earned his PhD in Animal Breeding from Punjab Agricultural University, India.

Prior to his current position, since 2008 Dr. Singh served as the Director of Extension in the same university. Before that, he worked as Director of the State Agriculture Management Extension and Training Institute (SAMETI), and Head of the North Temperature Regional Station, Garsa, Kullu, Himachal Pradesh, India. Earlier, he worked as Principal Scientist of Livestock Production and Management at NRCWA, ICAR, Bhubaneswar, as well as Head of Poultry Science (1992-1995), and Animal Nutrition of SKUAST of Kashmir, India (1993-1995).

Since his appointment as VC, Dr. Singh is also the Chairman of the Board of Management of SKUAST – Jammu. He has published 154 scientific publications. Out of these, 16 research articles have been published in Thompson Reuters Impact Factor Journals. He also published, authored or edited 18 books and three policy papers. In 2017, he



Dr. V. P. Chovatia, In-Charge Vice-Chancellor, Junagadh Agricultural University (JAU), India



Dr. V. P. Chovatia, In-Charge Vice Chancellor, Junagadh Agricultural University (JAU), Gujarat, India earned his M.Sc (Agri.) and Ph.D. in Genetics and Plant Breeding from the Gujarat Agricultural University (GAU). He has more than 35 years of professional experience in agricultural education, research, extension and administration in various

received a Lifetime Achievement Award by the Society for Veterinary and Animal Husbandry Extension (SVAHE), Ludhiana; and Outstanding Veterinary Student Award by the Government of Rajasthan, India, in 1983.



NEW APAARI STAFF

Manish Rai – Finance Coordinator



Manish Rai, Indian national, earned his MBA in Finance from the Periyar University, Tamil Nadu, India, and Masters in Banking and Insurance Management (M. Com) from the Annamalai University, Tamil Nadu, India. He has over 15 years of international experience in Asia-Pacific in the areas of finance, operations, administrative

functions, HR, procurement and IT management. Prior to joining APAARI in July 2019, he was heading finance and accounting activities, and overseeing the preparation of financial reports for various international agencies, including ACIAR, ADB, EU, FAO, IFAID, USAID, USDA, as well as national governments. Mr. Rai is also skilled in capacity building in niche areas of finance and supportive of sustaining a positive work environment. Further, he has contributed to various social development activities across international development organisations, public organisations and non-government sectors, such as APAARI, BISA and certain CG institutes.



Chieh Chieng Lin – Technical Associate



APAARI recruited Mr. Chieh-Cheng, Lin, a Taiwanese national, as Technical Associate to assist with the current APCoAB project supported by COA, Taiwan. He earned his Bachelor and Master Degree in Applied Economics from the NCHU, Taiwan. Prior to joining APAARI in September 2019, he worked as Assistant of

Department of Applied Economics, NCHU, Taiwan.



UPCOMING EVENTS

- Basic Wheat Improvement Course 2020, Texcoco, Sonora, Mexico, 3 February 2020- 29 May 2020, CIMMYT
- Massive Open Online Course: Conservation Agriculture-based Sustainable Intensification, 12 February- 25 March 2020, CIMMYT, Australian Aid, SRFSI
- ILRI Institute Management Committee, Nairobi, Kenya, 25-26 February 2020, ILRI
- 24th Biannual International Plant Resistance to Insects (IPRI) Workshop, Texcoco, Mexico, 2-4 March 2020, CIMMYT
- Training of CAAS AIS assessment team, Beijing, China (dates TBD), APAARI/CAAS/FAO
- Inception Workshop for Asia Pesticide Residue Mitigation through the Promotion of Biopesticides and Enhancement of Trade Opportunities, 4-6 March 2020, Bangkok, Thailand, Rutgers University, STDF/WTO
- CGIAR Gender Platform Launch, Nairobi, Kenya, 8 March 2020 ILRI
- Interdrought 2020, Mexico City, 9-13 March 2020, CIMMYT
- Workshop on environmental and natural resource economics, Yangon, Myanmar, 10-14 March 2020, SANDEE-ICIMOD
- Micronutrient Forum 5th Global Conference 2020, Building New Evidence and Alliances for Improving Nutrition, 23-27 March 2020, Mahidol University, IFPRI, HNRC-IMERI
- ICAR-NAARM, Hyderabad Capacity Building Programmes 2019-20, Hyderabad, India, 2 April- 2 May 2020, ICAR, NAARM
- National Food Technology Seminar 2020, Putrajaya, Malaysia, 14-15 April 2019, MARDI
- 18th SANDEE Summer School 2020 on Environmental and Resource Economics, Bangkok, Thailand, 3-17 May 2020, SANDEE-ICIMOD
- 3rd Asian Horticultural Congress 2020 (AHC 2020), Bangkok, Thailand, 7-9 May 2020, DOA, Thailand, DOAE Thailand, ISHS, Kasetsart University, Horticultural Science Society of Thailand.
- Executive Committee Meeting of APAARI, 26-27 May 2020, Bangkok, Thailand
- 7th Plant Genomics and Gene Editing & 2nd Microbiome for Agriculture Congress: Asia, Taipei, Taiwan, 1-2 June 2020, Global Engage



NEW APAARI MEMBERS

Associate Members:

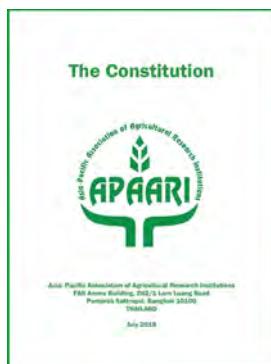
- Krishi Gobeshona Foundation (KGF), Bangladesh
- Biotechnology Industry Research Assistance Council (BIRAC), India

Affiliate Member:

- National Taiwan University, Taiwan

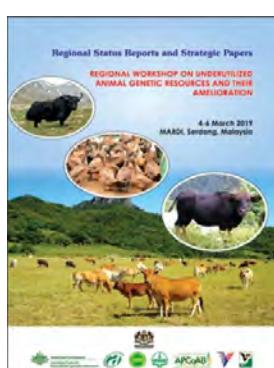


NEW PUBLICATIONS



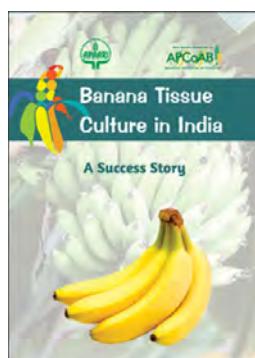
The APAARI Constitution
(July 2019)

Common Framework on Capacity Development for Agricultural Innovation Systems – Synthesis (Hindi Version) (Sept 2019)

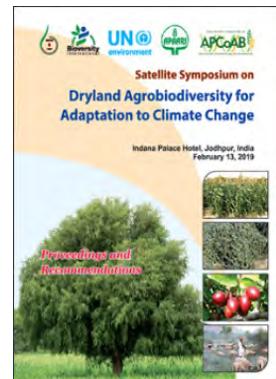


Regional Status Reports and Strategic Papers on Underutilized Animal Genetic Resources and their Amelioration (October 2019)

Banana Tissue Culture Success Story (December 2019)



Regional Conference on Role of Soil and Plant Health Towards Achieving Sustainable Development Goals in Asia-Pacific – Summaries & Recommendations



Satellite Symposium on Dryland Agrobiodiversity for Adaptation to Climate Change (December 2019)



EXECUTIVE COMMITTEE 2019-2020

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Dr Peter Horne
ACIAR, Australia

Vice Chair

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ICAR, India

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IAUA, India

Dr Muhammad Azeem Khan
PARC, Pakistan

Member Secretary

Dr. Ravi Khetarpal
Executive Secretary, APAARI

APAARI acknowledges the partnership and support of all the members and stakeholders

THANKS TO APAARI MEMBERS AND PARTNERS



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