



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

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EDITORIAL

Dear APAARI Members, Partners and Stakeholders,

The year 2021 has been a tumultuous one for APAARI, with the repercussions of COVID-19 also pronounced in the way we implement our Strategic Plan and interact with our stakeholders. The pandemic has further highlighted the importance of food security and the need for strengthening Agricultural Innovation Systems (AIS) now more than ever. By the end of 2021, we have successfully adapted to the new normal and navigated new ways to tackle challenges, especially for women and youth, and other disadvantaged groups, through various projects and initiatives across the Asia-Pacific region.

As you all know, at the project level, APAARI develops and secures regional and global projects, and then facilitates their implementation with the support of project partners and beneficiaries. In 2021, we completed a number of activities including: Rapid appraisal assessment on capacity development for agricultural innovation system supported by FAO, research to policy link study sponsored by ACIAR, and ASTI project sponsored by ACIAR. We also renewed our partnership with the CG system and facilitated a number of webinars including the series on "Application of Gene Editing in Sustainable Agriculture and Food Security in Asia Pacific Region", "Investment in Modern Agricultural Biotechnology and its Socio-economic Impact on Livelihoods of Farmers in Asia-Pacific", and "Expert Consultation on Agroforestry for Environmental Resilience and Sustainable Livelihoods of Farmers in Asia-Pacific". We further undertook an in-house Medium-Term Review of the Implementation of our Strategic Plan 2017-2022.

This year, significant challenges affected the implementation of projects and other activities due to travel restrictions. Nevertheless, APAARI ensured that projects, such as the one on pesticide risk mitigation for promotion of bio-pesticides for facilitation of trade in Asia, funded by STDF/WTO and USDA, needing hands-on laboratory capacity building, were organized most effectively through virtual or hybrid mode lab training. The activities under Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB) sponsored by COA; the collective actions on forgotten food sponsored by GFAR; the FAO-coordinated on scaling up initiative of the TAP Common Framework on capacity development for AIS; and, the EU-AFD funded project on Agroecology and Safety Food Systems Transition, were all held through webinars with effective participation from the respective regions and partners involved.

The spirit of APAARI has been to keep the ball rolling and ensure
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EDITORIAL TEAM

- Ms. Pooja Mathur
- Ms. Martina Spisiakova
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continuous networking and engagements with members and partners, while scoping for, and developing new projects for donors.

Besides, at the Secretariat level, we initiated a series of recurring virtual interactions to update members on the ongoing activities, apprise them of key engagement opportunities, seek their suggestions, and address their requirements. One of our encouraging outcomes of this initiative is Cambodia becoming APAARI's new core country member. These quarterly member meetings are a strategic opportunity for the APAARI secretariat to ensure members' participation in APAARI initiatives and governance, while building a momentum towards strengthening AIS across Asia-Pacific.



HIGHLIGHTS FROM THE APAARI SECRETARIAT

APAARI organized a webinar series to build awareness on genome editing techniques and application in the Asia-Pacific region

In a three-part webinar series, APAARI, in association with Korea Biosafety Clearing House (KBCH) and Biotech Consortium India Limited (BCIL), aimed to stir discussion on genome editing techniques, application and policy advocacy. This open forum discussion brought forth major observations, potential of gene editing and various challenges related to it.



The Webinar Series on "Application of Gene Editing in Sustainable Agriculture and Food Security in Asia Pacific Region" comprised three webinars entitled as Webinar 1: Genome editing tools and its applications for targeted plant breeding, July 21, 2021; Webinar 2: Advancing genome edited plants from lab to land, August 4, 2021; Webinar 3: Enabling policies for genome editing in agriculture, August 18, 2021.

We sincerely thank all the members and partners of APAARI for their very active cooperation during these tough times. We are proud of this collective strength of APAARI members and shall continue moving forward to drive collaboration, build capacity and advocate for issues of critical importance to Asia-Pacific.



Dr. Ravi Khetarpal
Executive Secretary, APAARI

These were organized in collaboration with Korea Biosafety Clearing House (KBCH), Republic of Korea, and Biotech Consortium India Limited (BCIL), India. The objective of the webinar series was to spread awareness among various stakeholders about gene editing techniques in the Asia-Pacific region by engaging a large number (>700) of stakeholders including experts, researchers, academicians, policymakers, students etc. Speakers/panelists converging from Australia, Bangladesh, India, Japan, Malaysia, Philippines, Republic of Korea, Taiwan, Thailand and the USA, made presentations and participated in the panel discussions.

Participants benefited immensely from the excellent presentations and interaction in panel discussions

Major observations from this webinar series were as follows:

1. Genome editing can help breeders produce novel traits, adding speed, precision, and efficiency to their breeding programs
2. Genome editing those results in the introduction of simple mutations or small insertions should not be subjected to the additional regulations imposed on transgenic crops
3. Many countries have introduced policies that

- keep the regulatory burden for low-risk genome editing applications low enough to allow small and medium-sized enterprises and academic research institutes to clear the regulatory hurdles
- There is a need for international harmonization in environmental risk/safety assessment and regulation.

Inputs from discussions will feed into the preparation of a resource document on "Applications of Gene Editing in Sustainable Agriculture and Food Security in Asia-Pacific Region" by subject specific international experts. This resource document is aimed to provide governments and other interested stakeholders with vital technical information needed for policy development, particularly regarding issues related to any potential regulation of gene edited plants.



Regional workshop to boost investment and impact in modern agricultural biotechnology in Asia-Pacific

To assess, innovate and attract investment to promote agri-biotechnologies in the region, a two-day online workshop was organized by APAARI, under its programme Asia-Pacific Consortium on Agricultural Biotechnology and Bio-resources (APCoAB).



In collaboration with the Philippines Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), Philippines, Council of Agriculture (COA), Taiwan, CropLife Asia (CLA), Singapore, and, Federation of Seed Industry of India (FSII), APAARI organized a virtual regional workshop on Investment in Modern Agricultural Biotechnology and its Socio-economic Impact on Livelihoods of Farmers in Asia-Pacific.

Eminent global experts from 17 countries contributed to the discussion during the regional workshop. A total of 984 participants registered for the workshop, out of which 424 (researchers and research managers from governments, academia, industry and NGOs;

35% women) took part from 33 countries.

The objectives of the Regional Workshop were (i) to assess the investment in agri-biotechnology and its impacts on livelihoods of farmers in Asia-Pacific region, (ii) to scope innovative ways of enhancing the investment in important areas of agri-biotechnology in Asia-Pacific region, and (iii) to enable government policies to attract the investors from private sector for R&D and to promote agri-biotechnologies in the region.

Major recommendations arising from the regional workshop were related to:

- Prioritization of public and private investments towards Agri-biotechnology
- National and Regional (Asia-Pacific) R&D collaborations and/or partnerships
- Capacity-building activities focusing on crop development and varietal improvement using new breeding techniques
- Investment in Knowledge Management and communication to promote biotechnology and address political and social concerns
- Development of Agri-biotechnology-focused roadmaps for crop production



APAARI conducted a virtual Pest Risk Analysis training for Bangladesh officials

APAARI recently trained officials from the Bangladesh Gov. on Pest Risk Analysis (PRA): Risk Assessment, Risk Communication, and Risk Management from 3rd to 9th Aug 2021 supported by USAID and USDA. The training briefed participants on export compliances and policies.

APAARI organized a virtual training on Pest Risk Analysis (PRA) in Bangladesh on ‘Risk Assessment, Risk Communication and Risk Management’, from 2-9 August 2021, funded by USDA and USAID.



The key speakers were Mr. Md Asadullah (Director General of DAE), Mr. Anwar Hossain (Director, Plant Quarantine Wing), Dr. Ravi Khetarpal (Executive Secretary, APAARI), Ms. Rebecca Robinson (Feed the Future (FTF) Team Leader and Deputy Office Director, USAID), Mr. Mark Rosman (Agricultural Attaché, USDA/FAS Dhaka) and Ms. Mary Parrish (USDA).

The training was coordinated and facilitated by Dr. KS Varaprasad (Senior Consultant), Dr. Ahsan Ullah (Coordinator) and Ms. Sasireka Rajendran (Project Manager) from APAARI. Dr. Michael Hennessey and Dr. Lloyd Garcia, consultants from the USA, were the technical coordinators for the PRA training. Functional capacity aspects of the training were blended into the technical training based on the common framework developed by the Tropical Agriculture Platform (TAP) and implemented by Ms. Martina Spisiakova (Knowledge Management Coordinator) and Ms. Sasireka Rajendran (Project Manager) from APAARI.

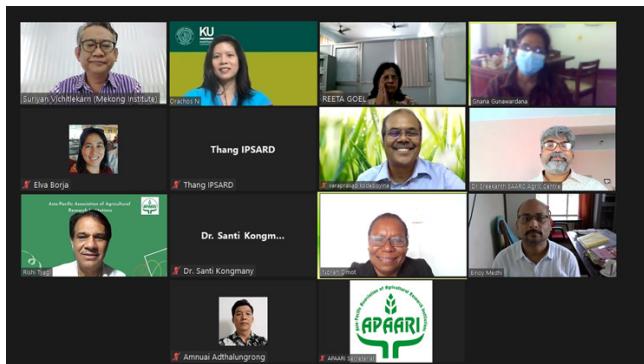
42 participants, including senior officials from the Department of Agricultural Extension (DAE) of the Ministry of Agriculture, university professors, scientists from research institutes and seed industry, took part in the 8-days long training session on plant health risk analysis in agricultural import-export. The training included group discussions and case-study based activities, and saw active participation from the trainees.



Survey on ‘Research to Policy Pathways’ to enable the uptake of research evidence in policy processes

APAARI conducted a survey on “Research to Policy Pathway discussions” focusing on ways to influence

evidence-based decision making in agricultural policies. The survey included responses from 49 respondents based out of 16 countries in South-East Asia.



Agricultural research evidence and information can help decision makers to make well-informed decisions about policies, programmes and projects to bring benefit to the sector and, importantly, to smallholder farmers.

In June 2021, APAARI administered a survey on the Research to Policy Pathways, which we received responses from 49 respondents representing 16 countries in Southeast Asia and the Pacific. The purpose of the survey was to map the agricultural research to policy pathways; understand the role and extent that agricultural research institutions engage with decision makers; and the use of agricultural research evidence and information in policy processes. A panel discussion and a focus group discussion, that were also part of the study, were conducted on 06 August 2022. The study highlighted that the research to policy link is disjointed.

Agricultural researchers have continuously generated evidence, scientific information and impact. However, the study found that many researchers are not aware of the research to policy pathways and are not communicating evidence or impact from their research to policy processes. In some cases, while there is awareness of the need to link to policy, especially amongst research managers, influencing policy still seems like a struggle.

According to the study, some of the barriers to the uptake of research evidence and scientific information in policy processes, are:

1. Lack of capacity of researchers to engage in the policy process
2. Research findings not targeting the needs of policymakers
3. Existing policies not supporting uptake of research evidence or impact

The study also found that to integrate research into policy processes, a number of things need to be considered such as,

1. Better engagement of researchers in the decision-making platforms,
2. Institutions need to set up research units that provide information for policy development, and
3. Researchers engage influencers or expert advisors to advocate evidence and impact at a higher decision-making level.

Understanding the link and communicating research evidence and scientific information effectively in ways that policy makers can understand, analyze and apply the evidence is important, as this can influence policy and well-informed decisions that address the challenges that the agriculture sector is facing.



APAARI conducted a regional expert consultation on Agroforestry in Asia-Pacific

To promote environmental resilience and sustainable livelihoods for farmers in the Asia-Pacific region, this virtual regional expert consultation was organized by APAARI. The discussion focused on innovative strategies, investment scenario and lessons learnt, to propel evidence-based potential of agroforestry research and innovation to contribute to the SDGs.



A virtual regional expert consultation on Agroforestry for Environmental Resilience and Sustainable Livelihoods of Farmers in Asia-Pacific was organized by APAARI jointly with Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF); Council of Agriculture (COA), Taiwan, on 13-14 October 2021. Eminent global experts from 9 countries contributed to the discussion during the Regional Expert Consultation. Some 199 participants registered for the consultation, out of which 153 (researchers and research managers from governments, academia, industry and NGOs; 26% women scientists) took part from 23 countries.

The objectives of the Regional Expert Consultation were (i) to enlighten the stakeholders on sustainable development through agroforestry in the region, (ii) to mainstream agroforestry through enabling policies and scaling-up investment in agroforestry, (iii) to share the lessons from the success and failure in agroforestry entrepreneurship, and (iv) to prioritize regional needs identified, especially to achieve SDGs during the Regional Expert Consultation.

The major recommendations that emerged from the expert consultation were as follows:

1. A new paradigm of intersectoral planning and policy is essential for each country to scale up practice of agroforestry
2. Context-specific local farm innovation with farmers as core innovator and focused around different stakeholders, especially private sector engagement is need of the hour
3. Political, Scientific and practical implementation knowledge are interconnected, and their integration is essential for functions and roles of agroforestry to achieve SDGs
4. Multi-Chain-Approach-Portfolio of agroforestry value chain for diverse opportunity and mitigation is a key for promoting agroforestry in context of smallholder farmers
5. Dissemination of knowledge, modern science, policy and communication-awareness are

interlinked and synergy is needed for scaling up of agroforestry in the Asia-Pacific Region.



Sparking a paradigm shift in the Asian-Pacific innovation investment landscape: A webinar series by APAARI and CoSAI

Three dialogue series took place between September-November 2021 to enable the emerging evidence and tools to be discussed by key stakeholders of the region, and for these

discussions to also influence the final products and recommendations of CoSAI, which concluded in December 2021.

The Asia-Pacific Association of Agricultural Research Institutions (APAARI), and Commission for Sustainable Agriculture Intensification (CoSAI) brought together agri-food systems experts and decision-makers from the Asia-Pacific region, to discuss and validate the current state of investment in agricultural innovation based on recently conducted studies by CoSAI. The aim was to explore how to overcome constraints to the development and uptake of key innovations for Sustainable Agricultural Innovation (SAI).

To support the required major boost in global support to innovation in agricultural systems that is urgently needed to reach the UN Sustainable Development Goals (SDGs), APAARI and CoSAI organized the following dialogue series:

1. The innovation investment landscape and future food systems – 28 September 2021
2. Decision support tools to enhance the impact of innovation investment – 21 October 2021
3. The way forward in the Asia-Pacific for innovation investment – a Side Event of the TAP Partners Assembly (the week of 22-26 November 2021)

In the first dialogue (28 September), APAARI highlighted the importance of agricultural innovation in the region to meet the challenges of climate change and zero hunger, as well as highlighting the importance of partnerships and engagement with global and regional bodies in the Asia-Pacific region for building capacities to innovate. The dialogue hinged on a recent report on the current level of investment in innovation for Sustainable Agricultural Intensification (SAI) in the Global South, commissioned and published by CoSAI.

David Shearer, Deputy Head of CoSAI, presented three key take-away messages from Dialogue 1 as follows:

1. We need a paradigm shift, embedded with evidence which in some ways escapes from the Green Revolution. It needs to go beyond profitability to ensure that we are tackling the challenges of the future food systems – ensuring equity within the planetary boundaries.
2. This paradigm shift needs to ensure that small-scale farmers are at the centre, while addressing the multi-variable issues that we have in the future food systems. Rather than new partnerships, multi-stakeholder partnerships are

needed, building on those that already exist.

3. There is a need to re-think the investment in innovation to become smarter investment, not just more investment. Such smarter investments tackle innovation in policy, finance, and capacity at individual, organizational, and enabling environment levels.

Taking the understanding of the investment landscape that was explored in the first dialogue, the second dialogue (21 October) discussed the decision-support tools as being crucial for improving the effectiveness of innovation in terms of impacting future food systems, and how decision makers can use these tools to improve their innovation investments. Specifically, the Dialogue aimed to:

- Promote awareness about the results of the CoSAI study
- Improve an understanding about various decision support tools
- Gather feedback on the tools from stakeholders

“This set of principles and metrics developed by CoSAI are envisioned to provide more evidence that leads to more investments and innovations for SAI, while addressing urban food security, nutrition security and climate action,” said Dr.Vara Prasad, Kansas State University, while talking about Feed the Future Innovation Lab for Collaborative Research on Sustainable Intensification at Kansas State University.

Mr. David Shearer, Deputy Head, CoSAI, summarized the key messages from Dialogue 2, referring to the recent global summits that are bringing global leaders together and calling for a transformation of the food system – a transformation not just to meet food and nutritional securities, but also to ensure that it is done in an equitable way and within planetary boundaries.

1. How we work together is much more about the soft skills to build partnerships and trust, how we integrate instruments and can be flexible. Flexibility from investors, implementers, and others involved with the partnerships is critical
2. The focus on technology innovation does not enable impact. We need to build an innovative environment with people embedded in that environment that have the capacity, and involves innovative policy, finance, and institutional development both of the public and private sector.
3. Business models need to be adaptable, equitable, and create partnerships, as well as build

capacities in order to address the complexities and challenges of our future food systems within the environmental boundaries of a net zero economy.

The third dialogue (22 November) of the series aimed to boost innovation and scaling up of SAI. The dialogue was organized as a side event of the TAP Partners' Assembly organized by FAO. It built on the previous two dialogues organized by APAARI and CoSAI, as well as the insights and challenges in investment for innovations from Africa, Asia-Pacific, and Latin America and the Caribbean. The event aimed to share regional perspectives on challenges and overcoming these challenges, identify opportunities for cross-regional learning, and shape regional strategies. Furthermore, in the context of global support platforms, such as TAP and GFAR, it also aimed to help integrate regional approaches into the TAP Action Plan 2022-2025, and GFAR's areas of collective action.

Dr. Ravi Khetarpal concluded the Dialogue by emphasizing the role of collaboration and innovation in closing the global gap in innovation and moving ahead in AIS. CoSAI studies pointed to the need for re-orientation of investments, while balancing out the economic, environmental, and social outcomes. The focus has to be clear in terms of who will do it, how it will be done, and how the global gaps will be covered with the existing USD 15.2 million per year to achieve the collective vision.



ASSET conducted a workshop to promote a green, inclusive and resilient recovery in the ASEAN region

The United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) and other Agroecology and Safe Food System Transitions (ASSET) project partners teamed-up to convene a multi-stakeholder virtual event to discuss the requirements for transition to agroecology and safe food systems. The workshop discussions were targeting to contribute to the current initiative to produce ASEAN guidelines on sustainable agriculture, as provided under the ASEAN Comprehensive Recovery Framework and Implementation Plan and to strengthen the Lao PDR-facilitated Initiative on Agroecology for the ASEAN (LICA) process.

As a part of the project, APAARI co-organized a two-day workshop on 'Agro-ecological and safe food transitions for green, resilient and inclusive recovery

The ASSET project is funded by the French Development Agency (AFD), the European Union (EU) and the French Facility for Global Environment (FFEM). The content of this presentation has been produced with the financial assistance of the French Development Agency (AFD), the European Union (EU) and the French Facility for Global Environment (FFEM). The views expressed herein can in no way be taken to reflect the official opinion of the AFD, EU or FFEM.

in the ASEAN region' on 8-9 November 2021. The organizers were the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Food and Agriculture Organization (FAO), and The French Agricultural Research Centre for International Development (CIRAD).

The workshop was attended by over 120 Government officials from ASEAN member states (in particular active ASSET project hosts and partners), Lao PDR-facilitated Initiative on Agroecology for the ASEAN (LICA) focal points, members of the Agroecology Learning Alliance in South-East Asia (ALiSEA) network, ASSET partners and partner networks, and other representatives of relevant civil society organizations, farmers' organizations, research institutions and the private sector.

The keynote address by H.E. Mr. Veng Sakhon, Minister, Ministry of Agriculture, Forestry and Fisheries, Cambodia, highlighted the important role played by CASIC in shaping the national agenda and bringing stakeholders, including the private sector together. The discussions highlighted that there is building momentum around agroecology and sustainable agriculture as strategic avenues – although nascent and facing complex challenges. Development partnerships and networks are making a difference and having policy impact.

Following a presentation on ASSET project perspectives, an expert and stakeholder panel moderated by Mr. Pierre Ferrand, Agricultural Officer (Agroecology) of FAO shared additional critical insights. Key messages highlighted in the wrap up by Katinka Weinberger, Chief of the Environment and Development Policy Section of ESCAP, included the need to establish a business model for agroecology, ensure farmers voices, support localization and adaptation by focusing on principles, address the incentives for monoculture and industrial agriculture, and look at food safety and impacts on vulnerable groups. The importance of partnerships for establishing normative and monitoring frameworks was also highlighted. Importantly for the ASSET project, the need to integrate policy processes from

“bottom” to “top” levels was highlighted, along with the need to re-balance the power dynamics of knowledge production.



APAARI partnered with TLRI and FFTC to promote exchange of knowledge and research experiences in context of Antibiotic-Free Era in Livestock Industry

The joint international symposium focused on promoting a healthier utilization of animal vaccine and health-promotion feed additives in the Asia-Pacific region, against the increasing risks brought

2. Animal vaccines
3. Food additives
4. Private sector introduction.

The 2-day Symposium attracted more than 200 participants (off-site and on-site; 33% women scientists), with many eminent experts/speakers from 6 countries. APAARI as co-organizer, under its programme, namely, APCoAB, facilitated the participation from its member-countries in the Asia-Pacific region. A total of 15 participants were sponsored from 7 APAARI-member countries. The symposium aimed to increase and promote the awareness and application of animal vaccines and health-promotion of feed additives in Asia's livestock industry.



by antibiotic-resistant bacteria and reflecting consumers' concern on food quality and safety.

A virtual International Symposium on Innovation and Application of Animal Vaccines and Health-Promotion Feed Additives for Antibiotic-Free Era in Livestock Industry was organized by APAARI on 11-12 November, 2021, in partnership with Taiwan Livestock Research Institute (TLRI), Council of Agriculture, and Food and Fertilizer Centre (FFTC) for the Asia-Pacific Region, Taiwan.

The objectives of symposium were to (i) exchange knowledge on the development of animal vaccines and health-promotion feed additives and promote the feed industry; (ii) share the experiences and application of animal vaccines and health-promotion feed additives in livestock industry and stimulate the farm up-grading; (iii) increase the food safety and decrease the risk of antimicrobial resistance for human health; and (iv) exchange on the best practices and experiences on the regulations of animal vaccines and health-promotion feed additives as alternatives to antibiotics for the sustainable management of the livestock industry.

The symposium had 4 sessions:

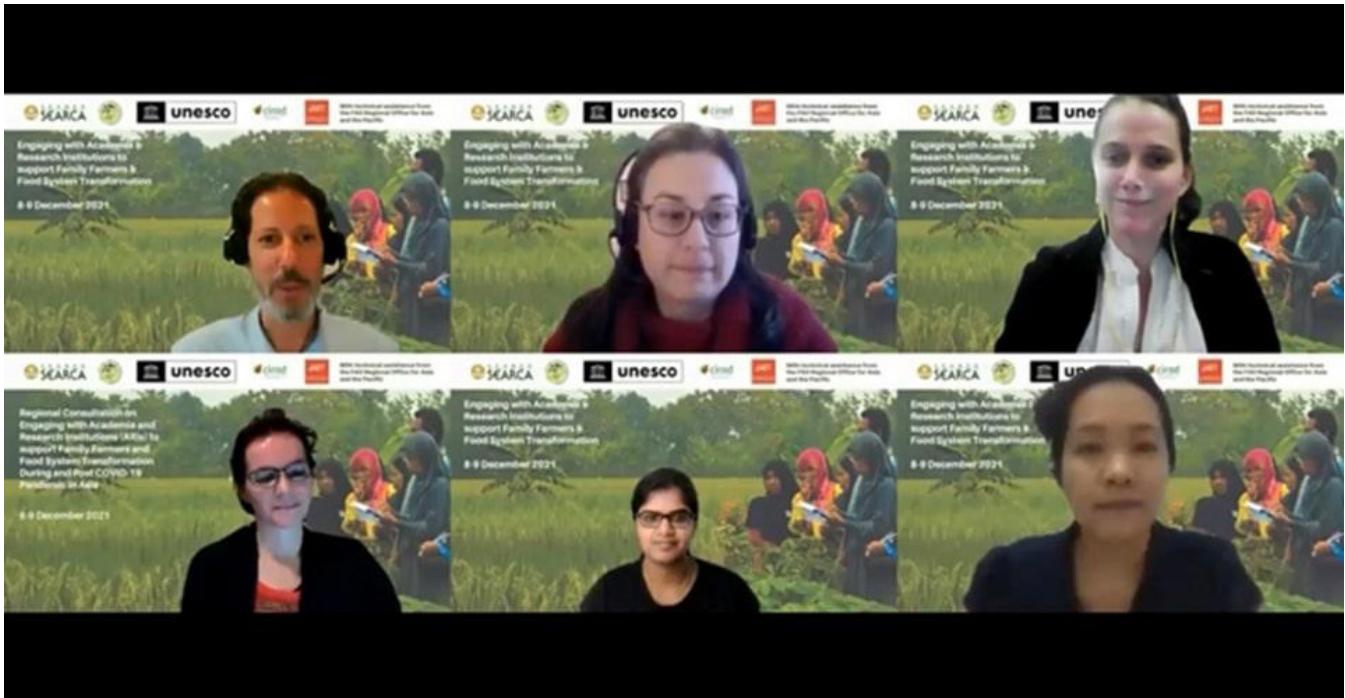
1. Keynote session



ASSET Project, in collaboration with SEARCA, AFA hosts a regional consultation to engage with ARIs in supporting family farmers during and post COVID-19 pandemic in Asia

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the Asian Farmers' Association for Sustainable Rural Development (AFA) jointly organized a two-day virtual regional consultation that highlighted the importance of collaboration among ARIs, family farmers' organizations, government agencies, and development partners in Asia in enhancing the livelihoods of family farmers and developing their capacities to cope with the COVID-19 pandemic through agroecology. Several recommendations emerged from the regional consultation, primarily on the transformation of agri-food systems.

Agroecology and Safe Food System Transitions (ASSET) project was highlighted and represented in the two-day virtual regional consultation, held between 8-9 December, titled 'Engaging with Academia and Research Institutions (ARIs) to Support



Family Farmers and Food System Transformation During and Post COVID-19 Pandemic in Asia.'

The consultation's first day concluded with a panel discussion to provide insights on fostering collaboration between ARIs and family farmer organizations (FFOs) towards sustainable and green rural transformation. The panel discussion touched on the following issues: existing challenges for education and extension to reach out to smallholder farmers and their organizations, the extent and limitation of digital transformation, and strategies to connect ARIs and family farming organizations. In the panel discussion moderated by Mr. Francois Enten of GRET, the panelists agreed that collaboration between ARIs and FFOs can be fostered through increased government subsidies to family farmers and agroecology, continuous dialogue between agroecology advocates and family farmers, establishment of infrastructures to support digital transition, and promotion of agroecology adoption using Big Data.

During the second day of the regional consultation, the organized parallel sessions were divided into four major topics: enhancing rural communities' initiatives and transfer of technologies; regional/local policies and strategies to support family farmers and sustainability of rural livelihoods and communities; multi-stakeholder networks and platforms enabling co-creation of knowledge and participatory research; and innovation in higher education institutions (HEIs) curriculum to better address agroecology and family farming.

The meeting was attended by international participants coming from different ARIs, non-

government organizations (NGOs), civil society organizations (CSOs), government agencies, and development partners. The regional consultation highlighted the importance of collaboration among ARIs, family farmers' organizations, government agencies, and development partners in Asia, towards enhancing the livelihoods of family farmers and developing their capacities to cope with the COVID-19 pandemic through agroecology. Several recommendations emerged from the regional consultation, primarily on the transformation of agri-food systems. This transformation requires pragmatic thinking and farmer-led approaches, as well as inclusive partnerships and digital transition. APAARI was the co-moderator for the interactive session on Enhancing rural communities' initiatives and development, and transfer of technologies.

Some of the key strategies to support rural transformation, agroecology mainstreaming, and more resilient agri-food systems, emerging from the parallel discussion across the two days were:

1. Redefinition of roles of ARIs
2. Customization of digital learning innovations to address the needs of communities
3. Integration of technical knowledge, field evidence-based initiatives, and interpersonal skills with higher education curricula to capacitate the young generation
4. Conduct of regular job market assessment to match curriculum to professional sector
5. Localization of agroecology and supporting of family farms through social community entrepreneurship

6. Investment on R&D potential of universities to generate more agri-entrepreneurs
7. Employment of adaptive scaling strategies, dialogue platforms, agroecology conducive policies, blended financial mechanisms, and public-private partnerships
8. Designing and nurturing alternative practices in innovation while creating an enabling environment for upscaling; and
9. Connecting gender, nutrition, and climate-resilient agricultural practices to agroecology.



ASSET forms a Community of Practice to better manage its communication flows and outreach

Agroecology and Safe Food System Transition (ASSET) being a huge collaborative project implemented by 27 partners, it is important that efficient and effective internal and external communication flows are ensured to better contribute to the project's objectives. APAARI formed a Community of Practice (CoP) on Communication (Com) earlier in 2021 to regularly discuss upcoming communication activities, needs and opportunities, and ensure an efficient way forward in presenting ASSET and its results to external audiences.



To encourage networking, learn about progress and follow up on activities pertaining to the Agroecology and Safe Food System Transitions (ASSET) project in terms of communication and outreach, a community of practice (CoP) Virtual Networking event was organized on 14 December 2021. The event highlighted the key features and content of the Communication and Visibility Strategy, encouraged feedback and discussion, and emphasized the importance of having a strong CoP for successful coordination of the project. The focal points also expressed their expectations from the CoP, which was clarified. The event was an informal interactive meeting to touch base on the project and strengthen the relationship as a community. Representatives from Louvain Cooperation (Cambodia), Center for agrarian systems research and development (CASRAD), Northern Mountainous Agricultural and

Forestry Science Institute (Vietnam), Università di Firenze (Italy), Swisscontact, Fruit and Vegetable Research Institute (Vietnam), University of Florence (Italy), National University of Laos (NUOL - Lao PDR), Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD - Vietnam), Institute of Technology of Cambodia (ITC - Cambodia) participated in the networking and interacted with the project partners.



APAARI builds capacity around Genetic Diversity and Ex-Situ Conservation in an 8-day workshop

APAARI under its programme on APCoAB, collaborated with ICAR, to organize a virtual capacity building programme through demonstration on methodologies such as DNA extraction, quality check, primer designing, PCR and sequencing including Sanger's and NGS.



A Regional Capacity Building Programme on Application of Modern Biotechnological Tools for Management of Aquatic Genetic Resources was organized by APAARI, jointly with Indian Council of Agricultural Research (ICAR) at ICAR-National Bureau of Plant Genetic Resources (NBFGR) on December 16-23, 2021. ICAR-NBFGR is hailed as one of the best institutes for aquaculture resources in Asia with experts and technologies which are in vogue for characterization and ex-situ conservation of aquatic genetic resources (AqGR).

Based on the feedback obtained from the various participants who attended this programme in 2020, this training programme was designed according to the needs of participants engaged in various aspects of aquatic genetic resources management. While the programme was spread across three modules focusing on application of modern biotechnological tools for management of aquatic genetic resources, APAARI facilitated the delivery of Module 1 (Genetic Diversity and Ex-Situ Conservation: 8 days; December 16 to 23 December, 2021). A total of 28 scientists/researchers (68% women scientists) attended the above courses from 13 countries of the Asia-Pacific region. In addition to the ICAR institutes, experts/faculty were also drawn from FAO, universities from Austria, France, Hungary, Italy, Malaysia, Norway, Singapore, Taiwan, Thailand, and USA.



APAARI and APIRAS partner to strengthen AIS in Asia-Pacific through a Training of Trainers' (ToT) workshop

Training of Trainers' (ToT) workshops provide an effective strategy to equip employees and subject matter experts with new knowledge on how to teach others and to foster an environment that enables organisations to adapt to challenging environments.



The Training of Trainers' (ToT) workshop was organized by the Tropical Agriculture Platform – Agricultural Innovation Systems (TAP-AIS) project, 'Developing Capacities in Agricultural Innovation Systems: Scaling up the Tropical Agriculture Platform Framework'. APAARI and APIRAS co-organized the training session in association with FAO's Research & Extension (R&E) Unit, funded by the European Union (EU).

30 participants from 13 countries in Asia and the Pacific – Bangladesh, Bhutan, Cambodia, Kyrgyzstan, India, Indonesia, Lao People's Democratic Republic, Malaysia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam – joined the webinar on 19 and 20 October 2021. The participants were from different backgrounds – AIS practitioners, regional experts, researchers, extension advisors and capacity development specialists.

The training focused on introducing AIS concepts, the TAP Common Framework for functional capacity development and its approaches and tools for practical use. It also provided a common space for participants to share and learn from their own experiences by guiding them through case studies and group activities.

This Training of Trainers workshop helped the participants to develop a common understanding about the potential use of AIS framework and the tools and methodologies used for developing

functional capacities that are needed for an effective AIS. The content and its delivery across AIS, the TAP-CD framework, capacity development for AIS and case study sessions were very informative and thought provoking. The training reiterated the importance of strengthening functional capacities at different levels for enabling partnerships and collaborative problem solving that are needed for an effective AIS.



NEWS FROM NATIONAL AGRICULTURAL RESEARCH SYSTEMS (NARS)

Australian Centre for International Agricultural Research (ACIAR)

ACIAR's new support program bolsters agri-research community in the Pacific region

The ability of the Pacific region to retain its skilled agricultural researchers has been boosted by a fresh approach from the ACIAR Pacific Agriculture Scholarships and Support program (PASS).

Key points

- The ACIAR Pacific Agriculture Scholarships and Support (PASS) program supports Pacific islander students to gain master's and PhD qualifications.
- With the support of the PASS program, the completion rates for Master's and PhDs are 94% and 80% respectively.
- The program is helping to build and retain agricultural, forestry and fisheries research expertise and networks in the Pacific region.



PASS scholars participate in an induction session before commencing their study. (Photo: Richard Markham.)

Increased commitment to pastoral care and mentoring of students, as well as training of university supervisors, has been key to lifting achievement rates of PASS scholars to more than 90% in gaining postgraduate diplomas, master's degrees and PhD qualifications.

Formerly known as the ACIAR-University of the South Pacific (USP), Postgraduate Scholarship Scheme

(PASS) has included Fiji National University (FNU) as a second partner. PASS is now a multi-pronged program to engage master's and PhD students, strengthen priority areas of research, and build academic networks between Australia and the Pacific region.

Former ACIAR Research Program Manager for Horticulture, Dr Richard Markham, was one of the authors of an external review of the ACIAR-USP scheme, which was used to inform the broader and more ambitious PASS program.

'We've had some really successful people graduating from the program who are doing great work but the review findings have shown us that we can't take positive outcomes for granted,' says Dr Markham.

Success in numbers

Between 2008 and 2020, the ACIAR-USP Postgraduate Scholarship Scheme supported 91 students from 7 Pacific Island countries to complete 108 courses for postgraduate diplomas, master's degrees by research or PhDs in a range of agricultural fields.

From a low in 2012 when completion rates at USP were sitting at around 10% for PhDs and 15% for master's degrees, achievement rates among ACIAR scholarship awardees have jumped to 93% for postgraduate diplomas, 94% for master's degrees and 80% in gaining PhD qualifications.

Long-term benefits

Ms Joy Hardman, ACIAR- Capacity Building, says that a thriving agricultural research education system will help sustain the careers of Pacific region researchers, with the hope they can continue to contribute to solving agricultural research problems within their own Pacific context over the longer term.

ACIPR provides additional support to PASS scholars and academic staff in the form of professional development, peer-to-peer learning, research collaboration and higher degree research supervision training. Student work placements and career development are included under the program to build ongoing industry connections.

ACIAR connectivity

'It requires working in partnership to offer scholarships in developing countries to meet the requirements of participating universities and operate in complex environments. The unique factor in PASS is that the postgraduate student must be connected to an ACIAR research project in the region and address a research theme or question identified by the project,' says Ms Hardman.

'That gives connectivity for the scholar to the whole project team – both Pacific and Australian project members.'

According to Dr Markham, PASS offers opportunities for mutual learning and more strategic planning between Australian and the Pacific region universities, governments and businesses to offset the challenges facing the region's small and scattered economies.

'One of the gratifying things that PASS graduates have become very enthusiastic about is solving issues at home. By linking them up with viable government-funded research projects, they actually see a future and a career and are able to build professional networks,' he says.

Source: Patrick Cape, ACIAR; Patrick.Cape@aciar.gov.au



Department of Agriculture-Bureau of Agricultural Research (DA-BAR)

Study shows increased productivity and income through rice-cum-duck in rice-based farming community in Philippines

In a study and field trials supported by DA-Bureau of Agricultural Research (BAR), it is evident that integrated farming of rice and ducks in irrigated rice fields has led to reduced infestation of golden apple snails, pests for rice, by 95%, consequently resulting in higher yield (36%). Farmers further drew income by producing ducklings and eggs along with selling duck meat.



Integrated Rice-Duck farming in Philippines

Rice-duck farming system has been proven by studies to provide higher yield and income to farmers. In Cagayan Valley, the 2013 study of the Philippine Department of Agriculture-Northern Cagayan Experiment Station (DA-NCES) presented a yield increase of 36% and reduction of golden apple snail up to 95%, and controlled weeds in irrigated rice

through the integration of duck in rice farming.

With the goal of ensuring sustainable production and availability of food through crop-livestock integration, the rice-duck farming system was demonstrated in open-source pump irrigated areas in Lapagan, Tumauini and San Juan, Ilagan in Isabela Province through the funding support of DA-Bureau of Agricultural Research (BAR).

The project involved 150 farmer-cooperators which showed an increase in yield in both sites during the 2020-2021 dry season and 2021 Wet Season croppings.

The baseline data for rice yield in both municipalities was 4.2 tons per hectare. With the Rice-Duck Model Farms, the average yield performance of rice in San Juan, Ilagan during 2020 to 2021 dry season was higher at 5.28 t/ha, and 4.87 t/ha during wet season of 2021 using NSIC Rc480. For the same cropping seasons, the average yield of rice in Lapagan, Tumauini was at 4.28 t/ha and 4.76 t/ha which is favorable to farmers' baseline yield.

Rice cum duck is economically acceptable as farmers could achieve a higher net return of 54% with 121.91% return on investment, than 67.24% on sole rice production. It ensures a higher yield with reduced production cost and additional income from the ducks, providing 87.80% increase in income or ₱ 77,200 net returns compared to ₱ 22,640 net returns from the farmers' usual practices of traditional sole rice production.

Rice production technology introduced

Farmer-cooperators planted NSIC Rc480 at the rate of 40 kg/ha with a spacing of 20 x 20 cm. NSIC Rc480 is an inbred variety known to have tolerance to drought, is high yielding, and has good eating quality.

Other practices include two to three healthy seedling per hill, with hill density of 25 hills/m² (manual transplanting), plowed once, and harrowed thrice the field at one-week interval. These practices were under the nine key checks recommended in the PalayCheck System. The Rice Crop Manager (RCM) recommendation was used as a basis in nutrient management of the crop.

The rice paddy was enclosed in a poultry net to prevent the ducks from escaping while grazing.

Herding of ducks

In a 1,000 m², 20 heads (200 heads/ha) of two to three months old Muscovy ducklings were released in the field after 30 days from transplanting until the heading stage of the rice. During the first three to

five days, ducklings graze two to four hours/day. At flowering stage, ducks were removed and provided with shelter and pond, and were fed with locally fermented feeds using golden apple snails, azolla, rice bran, and other leguminous crops as supplemental feeding for the ducks.

Farmer-cooperators were trained by researchers from DA-Nueva Vizcaya Experiment Station who developed the feed formulation.

Farmer-cooperators' experiences

Arcadio Garcilian, one of the farmer-cooperators from Lapagan, Tumauini, experienced the benefit of integrating duck in his rice farming. Garcilian revealed that the integration of duck has significantly reduced the golden apple snails and weeds in his farm. From five heads of duck as starter in the project, he has grown the flock into 300 heads. In terms of yield, he recorded a yield from an inbred rice of 5.83 t/ha for 2020 to 2021 dry season as compared to his previous yield of 5.20t/ha.

A lowly farmer and Chairman of San Juan SWISA Inc. from Ilagan City, Conrado Ngayaan Sr. explicitly adopted the rice-duck integration for his demonstration farm and other production farms. After one cropping season, Ngayaan witnessed that ducks are good pest managers. He is now convinced that a good yield is still attainable without pesticides application.

"There's more income in rice-duck farming and now a good business too in our community," Ngayaan proudly said.

Value adding activities

The project trials revealed that 7 to 10 months Mallard and Muscovy ducks are very suitable for meat processing.

As such, duck meat-based products such as Quack-quack ham, Siomatik, Longanitik, EmbutiDuck, Mallard Sisig, and Duckos were launched as value-adding activities for additional sources of income. Ready-to-eat viands under the IPO-registered product name of Cagayan Valley's Duck and Chicken Delight were also developed supporting the duck production of farmers.

The technology was awarded to the SitioMinanga, San Juan SWISA Inc. and Cagayan River Irrigators Association. These adopters were incubatees of DA-Cagayan Valley Research Center (CVRC) through the Technology Business Incubation (TBI) for the processing of duck meat.

Meanwhile, the farmer-cooperators also produced

ducklings and eggs as the business enterprise of the community. Seven adopters from the Balik Probinsiya Bagong Pagasa (BP2) Associations in Isabela province were trained for duck processing.

The technologies and the results of the research conducted by DA-CVRC and DA-NCES were presented during the DA-BAR online webinar on 30 July 2021.

**Source: Gemma G. Bagunu and Jonabelle T. Infante,
DA-BAR**



NEWS FROM THE HIGHER EDUCATION

Professor Jayashankar Telangana State Agricultural University, Hyderabad, India

Accelerating Agricultural Research with Drone Application

Over the years, technology and innovation has provided solutions to many challenges faced by agriculture researchers and farmers alike. Agriculture drones are the upcoming technology that is now ready for take-off. At the precipice of this development, Professor Jayashankar Telangana State Agricultural University in India is accelerating research with drone application to solve real world problems ranging from efficiently dispersing pesticides, to precision agriculture, to optimizing water conservation, through public-private-partnerships.



RPAS in operation in of the research plots of the University

Modern day cultivation is ridden with scarcity of skilled labor during peak periods of agricultural activity, besides encountering rising production costs and dwindling natural resources in view of escalated urbanization. Such a predisposition is gradually orienting the farming towards mechanization to fulfill the intensive field practices in time. In this context it is pertinent to examine the prospects of automation in field operations through drones.

Drones are the Remotely Piloted Aircraft Systems (RPAS) provisioned with a programmable controller with or without the satellite navigation system and automated flight path planning features. These devices can carry payloads such as multi spectral high-resolution cameras, spray fluids along with application mechanisms for efficient field level deployment. Drones can be engaged for field survey, crop scouting, spraying, and spreading applications and crop canopy surveillance. Using the data captured, farmers can precisely calculate the extent of operational area, classify crop types and varieties, develop soil maps to plan and execute effective irrigation/nutrient management schedules and take up economical pest management based on ultra-dimensional scouting. These machines, once validated, could also perform specialized operations like seeding, weeding, hybrid pollination and high-resolution spectral imagery of crop microclimate.

With a vision to mainstream the field applications of drone technology at farmer level, Professor Jayashankar Telangana State Agricultural University (PJTSAU), Hyderabad has become the first Agricultural University in India to get approval from the Director General of Civil Aviation to carry out research in agriculture using drones. It has established working collaborations with Madras Institute of Technology (MIT), Govt. of India, Govt. of Telangana, National Bank of Agriculture and Rural Development (NABARD), World Agricultural Forum, Satsure and several drone start-ups like Marut Drone Tech, Thanos etc., to develop cutting edge technologies through integration of Artificial Intelligence, Machine Learning, Sensors and IOTs to make drone technology a field implementable solution.

Through a network project, utilizing research innovation funds, a study on developing Standard Operating Procedures for using drones in pesticide spraying was initiated and validated in a Public Private Partnership mode with Marut Drone Tech Ltd., during 2020 for mandate crops like Rice, Cotton, Pigeonpea, Groundnut, Sesame, Soybean and Safflower which are predominant crops of the State of Telangana covering more than 95% cropped area.

In another initiative, a project on varietal identification in rice, to establish traceability using drones, partnering with Satsure, World Economic Forum and Govt. of Telangana, is under progress.

Currently, PJTSAU is handling a new research project on 'Development of package of practices for direct seeded rice using drones' supported by funding from NABARD, envisaging water conservation in rice production, in association with Marut Drone Tech

Limited, which is a first of its kind in the country. This platform aspires to train rural youth in mastering drone applications. Further, studies on generating SOPs using drones for herbicide spraying in rice are in progress. All these efforts have transformed the PJTSAU into a pioneer in drone technologies in the country, thus, bringing drone know-how in agriculture to the farmers' doorstep and promoting smart agriculture in Telangana.

In spite of such a visionary approach by the University, lack of awareness among farmers about technical knowledge on drone usage and operation, non-availability of proper guidelines or crop specific SOPs for drone usage, lack of registered ULV pesticide formulations for loading in drone application and absence of supporting data on expansion of label claims of existing pesticide formulations for drone usage are plaguing the possible impact of this utility and its deliverables. Such lacunae hinder the research advancement and field adoption of this prospective technology.

Considering these bottlenecks, the PJTSAU has embarked upon intensification of research efforts in critical areas of drone application, to generate information on evidence-based data on drone efficacy in spraying against various insect pests or diseases vis-a-vis manual spraying, to study and standardize drone operating procedures for plant protection, to evaluate the efficacy of pesticide formulations against various insect pests and diseases of rice, and to develop crop specific SOPs for pesticide use by drones and identifying drone compatible special chemical formulations, adjuvants and optimizing their dosage in rice.

Further, to demystify the apprehensions about interference of spray chemicals applied by drones with the environment, special studies on ascertaining the impact of drone-based spraying of pesticides on avian and beneficial insect fauna, and soil microbiota etc., have also been initiated. Studies on product quality assurance through bio-efficacy studies and Pesticide residue analysis of insecticides and fungicides sprayed using drones in rice have also been taken up in multidisciplinary mode with an aim to quantify the target molecules in the economic product.

Source: Dr. M. Sreedhar, PJTSAU; dpmpjtsau@gmail.com



NEWS FROM INTERNATIONAL AGRICULTURAL RESEARCH CENTRES

International Association for Agricultural Sustainability (IAAS)

In discussion: New models for long-term sustainability development in aquaculture industry

International Association for Agriculture Sustainability (IAAS) conducted its Annual Meeting on 10th December 2021. Thought leaders, change makers, researchers, and industry professionals participated in various discussion primarily addressing the critical issues caused by climate change on aquaculture. The discussions ended with notable take-aways and recommendations.



Speakers attending the 2021 IAAS Annual Meeting

Climate change poses a considerable threat to global food security, with potentially existential economic, political, and social outcomes for humanity. Supporting a stable and resilient production of aquatic produce is not only an economic concern but a national security issue as well.

10th December 2021, International Association for Agriculture Sustainability (IAAS)'s Annual Meeting gathered more than 300 scholars, researchers, industry professionals and investors from 47 countries to discuss the challenges caused by climate change and share the solutions from different region's perspectives.

The special guest, Professor Lee Chee Wee, Director of Aquaculture Innovation Centre (AIC) addressed the challenges ahead and the advantages of Singapore as a hub for agricultural development. In his speech, he specially introduced the Public-Private-Community Partnership (PPCP) as the model to integration of capital, talents, and technology. This PPCP model was funded by the Singapore Government to share the technology in knowledge with the communities in ASEAN countries, India, Oman etc., through the network of Asia Development Bank.

Most intriguing session of the annual meeting was the panel discussion. It was moderated by Dr. Tan Wee Liang, Associate Professor of Strategic Management at Singapore Management University (SMU) and comprised Professor Lee Chee Wee, Director of Aquaculture Innovation Centre (AIC), Dr. Ravi Khetarpal, Executive Secretary of APAARI and Dr. Ho-Hsien Chen, Dean of Faculty of Agriculture of Pingtung University of Science and Technology. The panel discussion focused on how we can promote technology solutions between cross borders to tackle climate change and help the underdeveloped countries to overcome famine and malnutrition. The discussion was thought-provoking and prompted many responses from the participants.

In addition, the discussion also touched upon the role and Future of Aquaculture, Capacity development for agricultural innovation system, Strengthening Agricultural Innovation Systems in Asia-Pacific etc. by our esteemed guest speakers including Mr. David Shearer- Deputy Head of Secretariat at Commission on Sustainable Agriculture Intensification (CoSAI), Dr. Michael Philips- Director of CGIAR Research Program on Fish Agri-Food Systems (FISH) WorldFish, Professor Chih-Yang Huang- Associate Professor at Department of Aquaculture, National Taiwan Ocean University, Ms. Martina Spisiakova- Knowledge Management Coordinator, APAARI, and Dr. Rasheed Sulaiman- Director Centre for Research on Innovation and Science Policy (CRISP).

The conference ended with the IAAS Chairmanship Handover Ceremony. The founding chairman, Dr. Cheng-I Wei, formally handed over his chairmanship to Dr. Tzong-Ru Lee, Professor of National Chung Hsing University. Associate Professor Dr. Tan Wei Liang, Singapore Management University was slated to succeed as vice-chairman. Mr. Fu Kuo-Chang, doctoral candidate in Business School of Singapore Management University was announced as the new Secretary General.

IAAS will continue to combine technology, innovation and investment to promote sustainable agricultural development supporting Singapore in achieving its “30 by 30” vision and its responsibility to the global community.

Source: FU Kuo-Chang, Michael, IAAS; michael@vital-wellspring.com



The International Centre for Integrated Mountain Development (ICIMOD)

HKH2Glasgow - ICIMOD at COP26: Promoting mountains of opportunity for climate action in the Hindu Kush Himalaya region

In a high-level event at the 26th session of the Conference of Parties (COP26), ICIMOD introduced the ‘Mountains of Opportunity’ – an investment framework to enable partners to identify, align and scale up investment in mountain-specific climate priorities. As one of the three key messages under ICIMOD’s #HKH2Glasgow campaign started in December 2020, the investment framework has been introduced as an instrument to articulate a collective mountain voice at COP26.



The Right Honourable Sher Bahadur Deuba, Prime Minister, Government of Nepal, delivers the opening remarks and acknowledges the relevance of the Mountains of Opportunity investment framework; Photo: Udayan Mishra/ICIMOD

To promote the mountain agenda, ICIMOD undertook yearlong engagements in the lead up to UNFCCC COP26 in 2021, bringing together stakeholders, including the UNFCCC national focal points of eight member countries from the Hindu Kush Himalayan (HKH) region, members of the HKH High-Level Task Force, and representatives from the COP26 Presidency. ICIMOD officially launched the #HKH2Glasgow campaign, amplifying mountain voices for climate action in our region.

At Glasgow, ICIMOD participated in several key meetings and organized several events at the Cryosphere Pavilion as a part of the HKH Focus Day on 9 November 2021, making the case for ambitious climate action in the HKH and introducing a “Mountains of Opportunity Framework”. The framework – which aims to scale up climate-smart investment in six mountain-specific priorities – was strongly supported by the Prime Minister of Nepal and high-level representatives of other ICIMOD regional member countries. ICIMOD will continue to work on this and keep up the momentum to ensure that this framework brings in investments that benefit our mountain communities.

Source: Udayan Mishra, ICIMOD; Udayan.Mishra@icimod.org



Centre for Agriculture and Bioscience International (CABI)

CABI's work under the Better Cotton Initiative to help Pakistan produce better cotton extended for another three years

Cotton is Pakistan's largest industrial sector and remains a key livelihood source for more than one million farmers. CABI in Pakistan is set to impact over 52,956 cotton farmers and nearly 105,248 workers with training and knowledge sharing workshops. Between now and 2025, CABI will help promote integrated pest management, improve food security, empower women and benefit the environment, consequently improving income and reducing losses.



Cotton is sorted on a farm during harvest in the district Matiari, Sindh province, Pakistan (Credit: Asim Hafeez for CABI)

CABI's work to help Pakistan's cotton farmers reduce annual losses of around \$350m through poor production, transport and storage practices under the Better Cotton Initiative (BCI) has been extended for another three years.

CABI's centre in Pakistan has won £1.59m in funding from the Better Cotton Growth & Innovation Fund to help Pakistan produce over 451,887 metric tonnes of cotton lint between now and 2025. To do this, CABI will reach over 52,956 cotton farmers and nearly 105,248 workers with training and knowledge sharing workshops on issues such as proper cotton picking, health and safety, female empowerment and the prevention of child labour.

The project will also plan to establish a central soil testing and analysis laboratory – with the support of farmers and at no cost to them – to help ensure soil is fertile and of the best quality for the good production of cotton lint in the field.

Other plans include helping to tackle cotton pests safely and effectively once the crop is in production as well as raising awareness of the need for the use of personal protective equipment for the application of pesticides. The project will also look to advise farmers on the use of yellow sticky traps and pheromone traps for the monitoring and control of sucking pests of cotton and pink bollworms. It will also seek to introduce attractant crops to promote biodiversity and Integrated Pest Management (IPM) as well as how to prepare compost effectively.

Other work to improve the empowerment of livelihoods and women is the planned creation of food orchards for greater food security of the smallholder farmers and the development of female entrepreneurship for sustainable income generation through tailoring centres.

Value addition will be also sought to be added for greater income generation for poorer women farm workers through animal farming such as the rearing of chicken for eggs and meat.

It is hoped that the extension of CABI's work under the BCI Initiative will not only continue to increase cotton yields for Pakistan's cotton farmers and, therefore, their livelihoods, but also empower women who also play a key role in the crop's production as well as the family unit and wider community.

Noor Nabi Bhutto, BCI Project Manager in Sindh Province, said, "In awarding the grant to fund our work on helping to produce better cotton for another three years, the Better Cotton Growth & Innovation Fund was impressed with our strong organisational systems, competency of staff, body of research and our positive gender aspirations.

We are now looking forward to helping even more cotton farms in Pakistan protect their crops from harmful pests and diseases, while also conserving natural habitats and empowering women farm workers who play a very important role in cotton production.

We will also seek to increase staff working on the project to 232. This will give us even greater capacity to implement all aspects of the main activities we seek to conduct over the lifetime of the project."

Source: Dr Babar E Bajwa, CABI Pakistan; B.Bajwa@cabi.org

World Vegetable Center

Training made easy through the new WorldVeg Home Garden Toolbox

Through the publicly available Home Garden Toolbox, WorldVeg aims to encourage people to learn gardening, built on principles of agroecology, from structured yet simple content and from each other as they work toward building more productive gardens. It also promotes nutrition and balanced diets, thereby contributing to transforming food habits and increasing the use of plant biodiversity.



Home Garden Toolbox online landing page

Many people—rich and poor, young and old, rural and urban—have taken up home gardening during the COVID-19 pandemic. Growing your own vegetables, fruits, herbs and spices can contribute to healthier eating habits, and biodiversity conservation, among several other documented benefits. It also brings joy and a sense of purpose during times of hardship. Gardening in urban areas, on balconies, rooftops, vertically against walls, or in community gardens on vacant land contributes to the greening of urban environments, social interaction, and environmental awareness in addition to being a source of fresh food to eat. Home gardens are suitable to build people's understanding about agroecological production practices. Gardening is not difficult, but training can strengthen people's ability to deal with common challenges such as poor soil conditions, water shortages, pests and diseases.

The World Vegetable Center (WorldVeg) has developed a set of ready-to-use materials to support home garden training programs in low- and middle-income countries. This Home Garden Toolbox is based on participatory adult learning methods suitable for people with low literacy skills. It was developed by a team of external consultants led by Lauren Pincus with content provided by Elin Duby, Sheena Shah and Archie Jarman, and Evan Clayburg doing the graphical design. The toolbox is organized in 10 Facilitator Guides (subdivided into 21 training sessions, each about 3 hours long), 10 Crop Growing Guides, and a growing number of short instructional videos.

Gardeners first learn how to carefully observe the

landscape around them to pick a gardening site. They progress through the seasons and learn the skills they need to build healthy soil, plant a garden bed, control pests and diseases, manage water, and save seeds. Each lesson builds gardeners' confidence and enthusiasm for using their home gardens to improve their household's access to healthy vegetables and fruits.

All the training guides build on principles of agroecology. For instance, the guide on pests and diseases asks gardeners to collect insects from their garden and group them into insect pests and beneficials. Insect pests are then separated into 'piercing/sucking pests,' 'defoliators/chewing pests,' and 'borers,' and the facilitator explains how to prevent or control each category of insect pest. Gardeners also learn about the role of beneficial insects (natural enemies, pollinators) and flowering plants that can attract them. This knowledge is not just useful for pest management in gardens, but could equally be applied to farmers' fields. The high diversity of plants grown in a home garden also helps to demonstrate how plant diversity promotes beneficial organisms including pollinators. The small scale of home gardens therefore enables experimentation and learning, which can help farmers to innovate.

Because home gardening is directly linked with nutrition, the Home Garden Toolbox also includes a module on healthy eating, with the aim to promote the consumption of a wide range of nutritious local vegetables, fruits and herbs, thereby contributing to transforming food habits and increasing the use of plant biodiversity.

The toolbox is available in English and can be used or adapted to any location, context and language. All materials of the Home Garden Toolbox are publicly available (<https://toolbox.avrdc.org/>) and any organization can use them in their current form or adapt them as needed.

Crop Growing Guides are currently available for amaranth, cowpea, eggplant, kang kong, Malabar spinach, moringa, okra, pumpkin, sweet potato, and tomato. This is not a complete list of garden crops, but additional guides can be developed using the same format. Crop guides provide basic information about growing conditions (e.g., temperature requirements and tolerance to heat, drought and flooding), plant spacing and management, and photos to help identify common pests and diseases.

It is of great importance to improve the resilience of rural and urban households to maintain healthy diets under the COVID-19 pandemic or any other

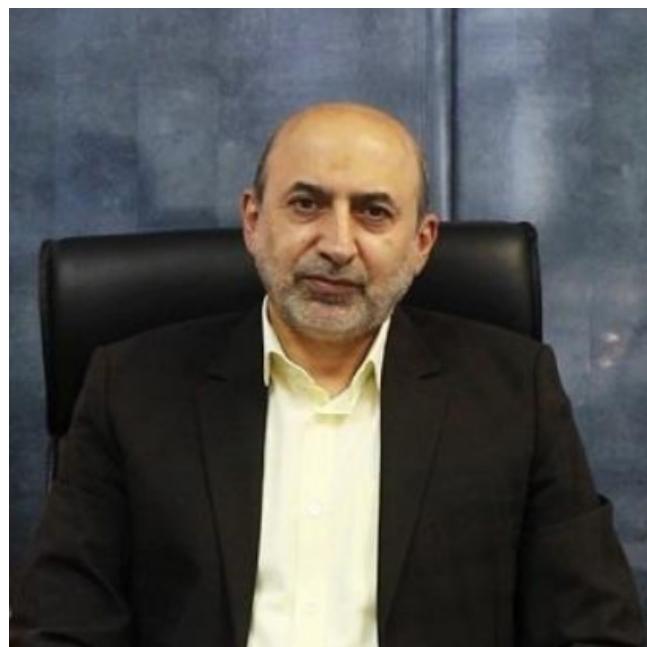
crises. One immediate way of doing this is to help people grow their own fruit and vegetables, which is a response observed in other crisis situations, be it poverty, armed conflict, or natural disaster. WorldVeg Home Garden Toolbox can foster knowledge sharing on agroecological practices more widely and promote healthy eating at a large scale.

Source: *Delphine Larrousse, World Vegetable Center; delphine.larrousse@worldveg.org*



NEW APPOINTMENTS

Dr. Mojtaba Khayam Nekouei, Deputy Minister of Agriculture and Head - Agricultural Research, Education and Extension Organization (AREEO), Iran



Dr. Mojtaba Khayam Nekouei has been appointed as the Deputy Minister of Agriculture and Head - Agricultural Research, Education and Extension Organization (AREEO). He received his PhD in Agricultural Biotechnology from University of UPM, Malaysia. He is also an associate professor in the Faculty of Biological Sciences in Tarbiat Modares University-Tehran. He previously served a Director of Agricultural Biotechnology Research Institute of Iran (ABRII), Consultant of Deputy Minister of Agriculture and Head of the Agricultural Research, Education and Extension Organization (AREEO), Chairman of the Biosafety Working Group of the Ministry of Agriculture-Jahad. Dr. Khayam Nekouei is a senior member in the National Standard Organization of Iran in food and beverage. His expertise is in safety and security of food, agricultural biotechnology, nano-biotechnology, biotechnology of endophytic

symbiotic fungi and molecular mechanism of endophytic fungi with plants.

Over the years Dr. Khayam Nekouei has held positions of Deputy of Vice President in Science and Technology, Head of Biotechnology and Nanotechnology Working Group in the Ministry of Agriculture-Jahad, Member of the Biotechnology Development Headquarters of the Vice-President for Science and Technology. He has held several important scientific positions, including Board Director Secretariat of the National Council for Biosafety, Deputy of Education and Research of Agriculture-Jahad Organization in Isfahan. He has published over 133 journal papers, many book chapters and patents in safety and security of food and agricultural biotechnology.

Dr. A.S. Krishnamoorthy, Vice Chancellor, Tamil Nadu Agricultural University, India



Dr. A.S. Krishnamoorthy has been appointed as the Acting Vice-Chancellor at TNAU and is also currently working as the 21st Registrar of TNAU, Coimbatore since 2019. He completed his M.Sc., (Agri.) and Ph.D. in Plant Pathology at TNAU, Coimbatore.

With over 32 years of experience in teaching, research and extension, he specialized in Mushroom Biotechnology, Biological Control of Plant Pathogens, Forest Pathology and Mycomolecules in crop protection. He has published more than 85 research articles in International and National journals and has presented at more than 100 invited lectures and led papers in National/International Seminars and Conferences. He has received 12 awards for his academic / research achievements. His significant achievements include introduction of the commercial

production technology for Milky mushroom and Calocybe indica var. APK 2, for the first time in the world. He was also responsible for the release of Oyster mushroom varieties, Pleurotus eous var. APK1 (1996), Hypsizygus ulmarius var. CO (OM) 2 (2004) and introduction of an outdoor system of cultivation of paddy straw mushroom, as intercrop in maize fields. He has organized several outreach programmes on Mushroom production since 1988. Dr. Krishnamoorthy has been instrumental in starting the regular “One Day Introductory Mushroom Training Programme” on 5th of every month at TNAU, Coimbatore, where he personally imparted the knowledge of mushroom production with more than 30,000 people.

Dr. Bram Govaerts, Director General a.i. (Secretary General and CEO), of CIMMYT



Dr. Bram Govaerts is appointed as the Director General a.i. (Secretary General and Chief Executive Officer) of CIMMYT. He holds a PhD in Bioscience Engineering – Soil Science, a master's degree in Soil Conservation and Tropical Agriculture, and a bachelor's degree in Bioscience Engineering, all from Katholieke Universiteit Leuven, Belgium.

Dr. Govaerts is renowned for pioneering, implementing, and inspiring transformational changes for farmers and consumers in meeting the sustainable development challenges. He brings together multi-disciplinary science and development teams to integrate sustainable, multi-stakeholder and sector strategies that generate innovation and change in the agri-food systems. His initiatives, excellence in science for impact and the partnerships he inspired have resulted in improved nutrition, nature conservation, and national and international

resilience and food security. His work is geared toward transforming subsistence agriculture and failed farming systems into productive and sustainable production units, and has worked in countries like Ethiopia, India and Mexico.

In 2014 he was awarded the Norman Borlaug Award for Field Research and Application — endowed by the Rockefeller Foundation and awarded by the World Food Prize — for the development of sustainable agricultural systems. In 2018 he received the Premio Tecnoagro, awarded by an organization of 2,500 Mexican farmers. He is a member of the Sustainable Development Solutions Network and A.D. White Professor-at-Large at Cornell University. In 2020, Govaerts was elected as Fellow by The American Society of Agronomy (ASA) for his outstanding contributions to the field of agronomy.

Dr. François Louis Roger, Regional Director, French Agricultural Research Centre for International Development (CIRAD)



Dr. François Roger is the new CIRAD Regional Director for continental Southeast Asia. He is also the regional representative for AGRENIUM, INRAE and MUSE (Montpellier University of Excellence).

Dr. François Roger is a veterinarian (DVM Paul-Sabatier University, Toulouse) and epidemiologist. He has earned an MSc from the University of London and PhD from the University of Montpellier. He is also graduated in biostatistics (University of Paris VI), in Microbiology (systematic virology and general bacteriology at the Pasteur Institute in Paris), in comparative immunology (CES at the Veterinary School of Alfort) and in microbial ecology (MPhil at the University Claude-Bernard, Lyon).

He has worked at CIRAD for more than 20 years in sub-Saharan Africa, Europe, South-East Asia and the Indian Ocean as a researcher and then, for the last 10 years, as Head of Research Units. He studied the epidemiology of several animal and zoonotic diseases and developed interdisciplinary health networks (One Health approaches) in the field of emerging and endemic diseases, particularly in South-East Asia when he was posted at Kasetsart University in Bangkok as Adj. Professor. Furthermore, he is a Public Health Officer (Inspecteur Général de Santé Publique Vétérinaire) on behalf of the French Ministry of Agriculture and Food. He is editor and reviewer for several journals and the author of more than 300 publications.

**Ms. Izabella Koziell, Deputy Director
General, Directorate, International Centre
for Integrated Mountain Development
(ICIMOD)**



On June 2021, ICIMOD welcomed its new Deputy Director General, Ms. Izabella Koziell, who brings to the role a depth and breadth of experience working on a range of environment and development initiatives, in multiple management and leadership roles, and across policy, development and research, spanning topics critical for the Hindu Kush Himalayan region, including climate change, water scarcity, biodiversity loss, and land and ecosystem degradation.

She has worked for more than 30 years at the juncture of climate, environment, and development with CGIAR, FCDO (when it was DFID), the International Institute for Environment and Development and the Lutheran World Service. During this time, she had held numerous leadership

positions in the UK, Africa and South Asia on policy, programs and research management.

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NEW PUBLICATIONS OF APAARI

Tissue Culture-Raised Apple Rootstock in India – A Success Story was published and printed (ISBN: 978-85-99249-50-5).

This document covers Introduction; In vitro propagation of apple; Rootstock Tissue Culture and its benefits; National Certification System for Tissue Culture-Raised Plants; Virus indexing protocol; Technology transfer; Economics of Apple Cultivation using TC Rootstocks; Successful examples of established agribusiness unit; Potential Benefits to Farmers and their Perception to Use Tissue Culture-Rootstocks. This document can be accessed on: <https://www.apaari.org/web/tissue-culture-raised-apple-rootstock-in-india-a-success-story/>

Policy Paper on Scaling up the Adoption of GM Maize in Emerging Economies: Economic and Policy Lessons from The Philippines, was published (ISBN: 978-85-99270-30-1).

Using the near two decades of experience with GM maize in The Philippines, this policy paper seeks to illustrate the issues and lessons learned regarding this technology. It is intended for policymakers, legislators, and policy advisors such as academicians and researchers who are involved in proposing new policy instruments, or revisions to existing policies related to GM crop adoption. This document can be accessed on: http://www.apaari.org/web/wp-content/uploads/downloads/2021/Policy_Paper_GM_Maize-Philippines_HIGH_Resolution_.pdf

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