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Philippines-AFACI partnership:
What have we done so far?

BAR R&D Digest is the official quarterly publication of the Department of Agriculture-Bureau of Agricultural Research (DA-BAR). A staff bureau of DA, it was established to lead and coordinate the agriculture and fisheries research and development (R&D) in the country. Specifically, BAR is tasked to consolidate, strengthen, and develop the R&D system to improve its effectiveness and efficiency by ensuring customer satisfaction and continous improvement through work excellence, teamwork and networking, accountability and innovation.

This publication contains articles on the latest technologies, research results, updates, and breakthroughs in agriculture and fisheries R&D based from the studies and researches conducted by the member-institutions of National Research & Development System for Agriculture and Fisheries (NaRDSAF).

BAR R&D Digest welcomes comments and suggestions from readers.

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Philippines-AFACI partnership: What have we done so far?

Dr. Nicomedes P. Eleazar, *CESO IV*

As the apex institution in the national agricultural research system, the Bureau of Agricultural Research (BAR) takes part in regional activities and represents the country in the international research community. Among its engagements is its membership in the Asian Food and Agriculture Cooperation Initiative (AFACI).

AFACI is an international cooperation body committed to improving food production, promoting the adoption of sustainable agriculture practices, and enhancing the extension services of Asian countries. Its efforts include the sharing of agricultural knowledge, mutual updating on information on agricultural technology and experiences on its promotion, facilitating cooperation among member countries for agricultural technology innovation, and the development of a human resource network. Officially inaugurated in Korea in November 2009, Korea is AFACI's prime mover in the agriculture and food sector.

Now, after seven years of carrying out AFACI projects and activities, we take our readers to what have been attained by the Philippines in terms of effects, interactions, and information/technology delivery. Also focus in this issue is the progress of current AFACI-funded projects and activities conducted by Philippine agencies in the areas of information sharing, plant genetic resources (PGR) management, development of postharvest technologies for horticultural crops, sustainable organic agriculture (OA), integrated pest management (IPM) for rice, and good agricultural practices (GAPs).

BAR's own experience in leading the Agricultural Technology Information Network (ATIN) on behalf of the AFACI member-countries as a viable platform for information exchanges is described in one article. Already in Phase III, the project has progressed from the "usual" practices in information sharing to more innovative ones. With the digitalization of data, we can now update our neighboring countries on what's happening in our agriculture and food sector. The mediums that the Philippines uses for the sharing of information already include social media (Facebook and Instagram), and compendiums of regional agricultural RDE success stories and attendant database. International cooperation in the network is now solid with 14 member-countries eagerly populating the AFACI-ATIN website with information for mutual exchange and benefit.

On PGR management, the focus is on food legumes. An AFACI project has given attention to the *Vigna* species (cowpea, stringbeans or yardlong beans, mungbean and rice bean) and pigeon pea. Strengthening of the country's plant genetic resources (PGR) network of food legumes, conserving the diversity of traditional *Vigna* species and pigeon pea, database management, and IEC materials development, are being attended to by the National Plant Genetic Resources Laboratory (NPGRL) of the Institute of Plant Breeding of the University of the Philippines Los Baños (UPLB) through the AFACI Integrated Management System of Plant Genetic Resources (IMPGR) project.

The reduction of postharvest losses and improvement in food quality and safety of selected horticultural crops is a big concern in the region. The Philippines, as the lead country, has engaged a number of AFACI member countries in the development of country-suited postharvest technologies for horticultural crops that include vegetables (tomatoes, pepper and cabbage), and fruits (banana, mango, strawberry and Asian pear). Significant outputs of the project led by the Post Harvest Research

and Training Center of UPLB, the lead agency, are books and manuals for the member-countries' ready reference.

Organic agriculture has come to be regarded as a safe alternative for producing healthy food over farming practices that often use dangerous chemical and synthetic inputs. However, there remains the matter of its sustainability under actual farming conditions. The Bureau of Soils and Water Management has therefore established model OA farms that demonstrate the viability of OA practices over time and in comparison with usual farmers' practices under the Asian Network for Sustainable Organic Farming Technology (ANSOFT). In these set-ups, highland farmers are being equipped with the necessary knowledge and skills on OA using local resources and are expected to move towards self-initiated efforts in OA using local resources.

Rice plant hoppers (RPH) are huge threats to intensive rice production systems in Asia as they transmit devastating plant viruses. With brown planthopper outbreaks being reported in a number of countries in Asia, concerted efforts in the management of RPH and other viruses across the regions, particularly through IPM, are needed. For this, a network of collaborating countries has been set up by the Philippine Rice Research Institute (PhilRice) in which information on outbreaks is shared in an on-line platform.

The lack of safe and good quality fresh agricultural produce in the country remains an issue particularly when it comes to selling these commodities in the international market. This is attributed to poor practices used by local farmers. Thus, the AFACI provided funds to the Bureau of Agriculture and Fisheries Standards (BAFS) to conduct a project on the development of GAPs. Initially, it looked into current farmer practices and the establishment of a code of hygienic practice for *gabi* leaves. The project has since moved on to other areas such as market linkages, implementation and controlling structure and monitoring and learning platform, the conduct of value or supply chain analysis, and the development of a traceability tool for determining the origin of a food product in the market.

Other articles in this issue discuss the economic impacts of AFACI projects, the production of IEC materials, and the inclusion of AFACI-generated information and technologies in BAR's regular seminars and a television program that features agriculture.

"RESEARCH RESULTS NOT DISSEMINATED IS RESEARCH NOT DONE"

Julia A. Lapitan

This has been the guiding principle of the Bureau of Agricultural Research (BAR) in promoting its supported research and development (R&D) projects and initiatives. And for more than seven years now, BAR has been partnering with the Asian Food and Agriculture Cooperation Initiative (AFACI), through one of its projects, the Agricultural Technology Information Network (ATIN) in continuously intensifying the promotion of information sharing and exchange.

This has been reiterated by BAR Director Nicomedes P. Eleazar saying that, "we make sure that matured technologies and relevant information will be used by the farmers according to their needs. We also promote a co-sharing of resources with our partners, like the AFACI." Dr. Elezar is the national principal investigator of AFACI projects being implemented in the Philippines.

The establishment of ATIN in 2009 was envisioned to promote sustainable agricultural green growth and contribute to the economic development of Asian countries through technological cooperation in agriculture and food sectors. Specifically, ATIN was developed to assist the AFACI 14 member-countries in planning on emerging agricultural problems and environmental issues including global warming, lack of capacity building, dwindling genetic resources, poverty, and hunger. Its establishment aims to support joint R&D, as well as the dissemination and transfer of agricultural technologies and promote collaboration in R&D.

ATIN was created to collaborate and forge existing agri-based database networks and systems and construct and expand a web-based standardized platform for sharing knowledge and data gathering on agricultural science and technology information.

With the development of the standardized platform of ATIN, member-countries were given the opportunity to disseminate and have an easy access on information developed and generated by other countries from various R&D activities. The updating of the database will give the member-countries a platform to promote information and technologies in their respective agriculture sector, which will also be beneficial to the Asian farmers and other clients.

For the Philippines, it continuously populates its database of technologies and information with BAR at the helm. Such technologies and information will guide not only the local farmers and beneficiaries, but also other farmers all over the world.

Strategies to intensify information exchange and sharing

Through the financial support from AFACI, various strategies have been implemented under the ATIN project. These include: 1) printing and publication of information, education and communication (IEC) materials such as crop calendars, manuals, flyers, and technology brochures; 2) conducting of seminars and field days; 3) participating in agricultural R&D exhibits; and 4) conducting capacity building for R&D clients. In turn, DA, through BAR, has provided equivalent inputs and resources in terms of financial and human resources.

BAR, through its Applied Communication Division (ACD) is tasked to spearhead the bureau's efforts on all AFACI-ATIN initiative. With this, BAR is continuously populating AFACI database website with the updating and uploading of crop calendars, planting guides or manuals, news and feature articles, and other publications.

The regular conduct of in-house, regional, and international seminars were intensified using the social media and distribution of IEC materials. The increase in number of seminar attendees was due to the intensified promotion of the bureau using its official Facebook (FB) page. People from the academe, local government unit, people's organizations, non-government organizations, and industry stakeholders were able to attend the seminars. The use of FB livestreaming also gave good opportunity for those interested individuals to watch the seminar in real time. Exchange of information and inquiries were made possible through FB messages.

Another venue for information dissemination and information sharing was through international conferences.

The conference served as a platform for dialogues of stakeholders from the academe, research institutions, government agencies, and other industry players in food and agriculture sector to foster a collective understanding and nurture R&D partnerships. The bureau took the opportunity to promote the technologies generated by various R&D activities by giving out IEC materials.

Another strategy implemented was the participation to farmers' field days conducted by DA-Regional Field Offices (RFOs). The event is being conducted to promote and disseminate agriculture technologies and practices that can be adopted by farmers and other interested clienteles. Farmers, representatives from the academe and local government units (LGUs), and other stakeholders are invited to the field days to personally witness the various showcased technologies and best practices being done.

BAR has been collaborating with the Agricultural Training Institute (ATI), DA's training arm, in distributing IEC materials to Farmers' Information and Technology Services (FITS) Centers in the regions. At present, BAR was able to distribute over a thousand copies of IEC materials like crop calendar, manuals, brochures, and flyers to FITS centers. The distribution is being done every other month of the year.

Way forward

With the efforts to strengthen and sustain the management of AFACI-ATIN project, BAR continues to develop and populate the AFACI database with its supported researches. The documentation of 13 AFACI-funded projects in the Philippines has already started, in coordination with a non-government organization media firm.

The outputs of the documentation will be shown in a national government television including social media such as Youtube. This can be used as material reference for future seminars, workshops, and conferences.

In all of these strategies, BAR is taking every occasion as an opportunity to disseminate IEC materials to its clients. The production of these IEC was made possible through BAR in partnership with AFACI.

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A study published in The Korean Society of International Agriculture in 2016 showed that projects under the Asian Food and Agriculture Cooperation Initiative (AFACI) were projected to produce high economic impacts in the countries where they are being implemented.

The study analyzed the results of 10 AFACI projects (ATIN, ANSOFT, Soil, Postharvest, AnGR, AMIS, GAP, IPM, Cassava, and Rice) showing four of them with high economic potential for the country beneficiaries. The four AFACI projects that showed high economic potentials were: Integrated Pest Management (IPM), Cassava, Postharvest, and Rice. The analysis was measured based on the economic costs and the number of years that it will occur.

Yoon-Doo Kim of the Konkuk University and Sang-Duk Lee of the Rural Development Administration (RDA) conducted the empirical assessment to provide qualitative analysis of the project performance and their economic impacts in each country recipient.

The qualitative analysis refers to the country-specific implementation of project and the promotion of best practices; the bases used were the annual project reports. A survey was also conducted with the Principal Investigators (PIs) of each member country to analyze the project performance. Meanwhile, the economic impact analysis used survey of project PIs in collecting data as well as objective statistical data information. Procedures to analyze economic impact include technology markets and market setting; economic life cycle, settings, and annual prevalence settings. Statistical data from FAOSTAT were also applied.

ACI projects show h economic impact

Rita T. dela Cruz

Results showed that for the IPM project, Indonesia will have an economic estimation of about $2,358,299 for the next 18 years while Vietnam will have $8, 682,519 for the next five years.

For the Cassava project, Thailand will have an economic cost of $ 1,187,404 for the next 19 years and $ 13,240,662 for the Philippines for the next 15 years.

For the Postharvest Project, Thailand and Vietnam will have estimated results of $13,665,325 in the next nine years and $62,451,317 in the next 14 years, respectively.

The Rice project will be beneficial for both Nepal and Sri Lanka giving them economic impacts of $60,629,555 in 13 years and $403,912 in nine years, respectively.

Qualitatively, these four projects were analyzed showing benefits and impacts to participating countries. Results showed that with the IPM project, crop losses were reduced and existing productivity was improved. The project also improved the competitiveness of participating countries through information sharing system. For the Cassava project, efficiency of the cassava production was enhanced and the income of farmers increased through technology transfer and information sharing. The Postharvest project increased the farm income through improved quality and cost of goods due to improved harvest management practices. It also reduced postharvest loss resulting to extra savings for farmers. The Rice project improved rice production by minimizing losses during production process. Effective interventions included breed selection and farm mechanization resulting to reduced production cost in rice farming.

The study mentioned that although AFACI is providing a relatively small amount to its member-countries, these projects continue to contribute to the development of the agricultural sector through sharing of relevant technologies and significant innovations that help the farming community to improve both their productivity and profitability. This is the essence of AFACI: to bring relevant technologies where they are needed the most through effective sharing of knowledge and exchange of best practices.

This article was based on the study of Kim, YD, SH Chae, and SD Lee. "Analysis for the Economic Impacts of AFACI Projects". Journal of the Korean Society of International Agriculture, 28(1):37-48(2016).

Resonating the results of AFACI-BAR partnership

Patrick Raymund A. Lesaca

At the top of any international cooperation and partnership is the promotion of the common good, resonating towards the good of humanity.

Promoting sustainable agriculture, enhancing technological innovation, establishing network for joint research and development (R&D) initiatives, intensifying technology, and sharing knowledge are important components and deliverables in attaining a progressive agriculture. These deliverables are also being intensified between the Philippines' Department of Agriculture (DA), through the Bureau of Agricultural Research (BAR), and the Korea's Rural Development Administration (RDA) through the Asian Food and Agriculture Cooperation Initiative (AFACI).

Transformational driven activities and technological innovations are just some of the initiatives undertaken by BAR and partner-agencies, which resulted into high-impact project outcomes.

AFACI-BAR partnership

AFACI was established on 3 November 2009 in Suwon, Korea. Government representatives from 12 countries, including the Philippines, participated through Department of Agriculture Undersecretary Bernadette Romulo-Puyat.

One of the significant outputs was the signing of the Memorandum of Understanding (MOU) among the member-countries which formalized the cooperation in promoting sustainable agricultural growth in the region. A year after AFACI was established, the Philippines hosted the first AFACI General Assembly Meeting. High-level government officials in agriculture and rural development paved the way for the continuing collaboration, which led to the funding of specific projects aimed at eradicating poverty and contributing to the economic development of the member-countries through technological cooperation in the agriculture and food sector.

AFACI is a network of agricultural cooperation that gears towards promoting

sustainable agricultural green growth in the Asian region and contributing to consistent economic development among Asian countries.

BAR and partners towards R&D extra-milers

All AFACI-funded projects being implemented in the Philippines are being managed by DA's staff bureaus and attached agencies, and selected state universities and colleges (SUCs). BAR is the overall coordinator of the AFACI projects.

As the lead coordinating agency, BAR has been coordinating 14 R&D projects in collaboration with two SUCs, namely: University of the Philippines Los Baños (UPLB) and Central Luzon State University (CLSU); and with the Bureau of Animal Industry (BAI), Bureau of Soils and Water Management (BSWM), Bureau of Agricultural and Fisheries Standards (BAFS); Philippine Center for Postharvest Development and Mechanization (PhilMech), and Philippine Rice Research Institute (PhilRice).

Of the 14 projects, 9 have already been completed and 5 are still on-going. The remaining projects, since 2014, have been subjected to an annual project review being spearheaded by BAR.

The AFACI projects are clustered specifically on farming technology and soil fertility, plant genetic resources (PGR), postharvest technology, agricultural land management, climate change adaptation, pest management, rice and cassava production, production and processing, good agricultural practices (GAP), biofertilizer technologies, and information network.

The project on farming technology resulted to the adoption of an organic farming community village in Catarman, Camiguin Island, where a network of subsistence upland farmers have devoted themselves to practice organic agriculture. Meanwhile the PGR project has strengthened the national PGR network and conserved Solanaceous vegetables like tomato, eggplant, and pepper. This is a high impact project as there is now a collective effort on conserving the genetic identity of our traditional Solanaceous crops.

Publications on postharvest handling of tomato, cabbage, and banana were some of the direct outputs under postharvest project. These materials were produced independently and have been in circulation within the AFACI member countries and partners.

The GAP project includes supply chain analysis in the form of a survey questionnaire specific for stakeholders along the food supply chain. After determining the needs of the stakeholders, a traceability tool, including its training module, will be developed accordingly.

The importance of Integrated Pest Management (IPM) to combat rice pest and its application are given attention in the pursuit of increased rice production.

Meanwhile, under the AFACI-Agricultural Technology Information Network (ATIN), all presentation materials and reports are consolidated and uploaded on the website of AFACI-ATIN. The standardized information platform allows easy inter-country access to agricultural technology and information and its database to its users.

These are just some of the milestones generated under the forged seven-year partnership.

This partnership has also resulted in acquiring some recognition. Dr. Victoria Lapitan of PhilRice and Dr. Perlita Nuevo of UPLB were named "Most Outstanding" Projects and Principal Investigators. Mr. Rodel Carating of BSWM and Dr. Romualdo Martinez of PhilMech were likewise accorded with "Outstanding" awards, while Dr. Genaro Rillon of PhilRice was awarded as Outstanding Principal Investigator in September 2016.

As of 2017, AFACI is now composed of 14 member-countries, with the recent addition of Bhutan and Myanmar in 2016. Its Secretariat is located at the International Technology Cooperation Center (ITCC), Rural Development Administration in Jeonju, Korea.

PHOTO: © RCARATING/BSWM

Asset-based community development: KEY TO SUSTAINABLE AGRICULTURE

Mara Shyn M. Valdeabella

The Bureau of Agricultural Research (BAR), as an agency dedicated to coordinate national research and development initiatives believes in the benefits of community organizing. Recognizing its important role in ensuring not only the participation but also the active involvement of the participants, BAR sees community-based projects and activities as an effective strategy in introducing and implementing development projects.

Such is the strength of one of BAR-coordinated projects, the Asian Network for Sustainable Organic Farming Technology (ANSOFT). ANSOFT is focused on technology generation as well as information and knowledge sharing among organic agriculture stakeholders and possible adopters. Given that, ANSOFT consortium in the Philippines was implemented in Mindanao, being the island having the largest number of organic farmer practitioners.

To enhance the delivery of the project objectives, ANSOFT Phase 1 necessitated the establishment of the Mindanao Network on Sustainable Organic Farming Systems (MINSOFS). With members coming from the government, academe, non-government organizations, civil societies, organic agriculture

enterprises, and religious organizations, MINSOFS is a network of networks that is focused on the consolidation and dissemination of sustainable organic farming technologies practiced in Mindanao.

Still implemented by the Bureau of Soils and Water Management (BSWM) of the Department of Agriculture (DA) through its principal investigator, Mr. Rodelio Carating, BSWM senior science research specialist, ANSOFT Philippines just concluded its second phase and is now on its third phase. Taking off from the results of Phase 1, which compiled effective organic farming practices for exchange and sharing among AFACI-member countries, the recently completed three-year project Phase II, is centered on the establishment and promotion of model organic farming village where farmers are treated as active partners rather than just mere recipients of technologies.

Model organic farming village

Located by the foot slopes of Mount Tres Marias, Barangay Mainit, Catarman, Camiguin Island has, for its people, copra (dried coconut meat to extract coconut oil) as the greatest source of income, alongside other cash crops such as corn, rootcrops, and vegetables. With most of the farms being tilled by local farmers originally forests that were cleared by illegal loggers before them, farmers recognized the need to adopt sustainable farming technologies that would improve not only their income but also state of their farming ecology.

To establish a model organic agricultural village in the Philippines, ANSOFT II selected Kalingatungan Upland Sustainable Farming and Stewardship Association, one of the original members of MINSOFS. With the association composed of 20-30 small and poor upland farmers who are engaged in intensive sustainable organic agriculture systems in high valued vegetables, ANSOFT II's primary objective revolved around improving farmers' income by enhancing various existing resources or assets in the area.

Enriching local resources, improving lives

ANSOFT II recognizes that to pursue holistic set of organic farming technologies, farmers have to look at their own locally-available resources as their means to improve their economic state. With this, project members, through their conduct of capacity building activities, provided technical capacity and skills to enable and empower trainers and farmers to utilize organic farming technologies with locally produced and available resources.

Using the total budget of $30,000 for the entire project duration, ANSOFT II centered on making the trainers and farmers understand the principles of "asset-based sustainable agriculture" toward bringing about improvement in their livelihood and income.

Defined as an approach to community building that sees community members as active change agents rather than passive beneficiaries or clients (Kretzmann & McKnight, 1993), asset-based community development when utilized in the ANSOFT II led to: 1) improved natural resource management; 2) improved farmer income; 3) strengthened community organization; and 4) human empowerment.

Members of the community were trained on the various organic farming technologies that the project team promotes and their application to locally-available resources.

Impacts of asset-based community development

Taking on the topic of organic livestock and poultry production, ANSOFT II conducted a series of farmer capacity building on 24-31 May 2015. Included in the training were lectures, workshops, and practical exercises on asset-based sustainable organic agriculture development, technical and practical considerations in natural livestock as well as sustainable poultry production system, identification and establishment of local feed sources, indigenous knowledge in animal livestock and poultry healthcare, housing layout and construction for both swine and poultry, establishment of piggery-based in-situ

Asset-based... from page 13

bacterial food compost, renewable energy system in piggery swine management, among others.

Through these trainings, participants acquired knowledge not only on the technical aspect of organic and poultry production, but also on recognizing botanical species of food, pesticide, or animal feed value that they can utilize to practice organic agriculture. With this, farmers started to earn more as they became less dependent of external inputs. This led to greater income and savings for them. Further, with the renewed importance of these indigenous species, farmers also improved and increased the production and management of these natural resources.

Further, with the farmers now equipped with technological information on agriculture, they are now empowered to assess and adopt introduced technologies to their local agro-ecosystem. Trainings conducted also boosted the confidence of farmers as they are now capacitated in terms of skills and knowledge on organic farming.

Organic farming in Camiguin

With the foreseen positive impact and the inspiration drawn from the project to both the local farmers and the ecology, the whole province of Camiguin, through the support and leading of Governor Jurdin Jesus Romualdo, pledged to join the organic agriculture movement and come up with a Masterplan for Organic Agriculture Development and have each of its four municipalities a provincial government-funded ANSOFT-patterned model organic farming villages.

Awarded as the Outstanding ANSOFT project in 2014 and 2015, ANSOFT in the Philippines persists to deliver organic agriculture technologies to Filipino farmers toward a sustainable Philippine agriculture sector.

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PHOTO: © RCARATING/BSWM


BULAHAN

Freshness, cleanliness, and quality are among the major food attributes that consumers ultimately consider when purchasing agricultural products in the market. In context, the buying market will prioritize products which are Good Agricultural Practices or GAP certified.

GAP has been recognized as an essential tool in ensuring food safety which begins in the farm. It is an approach that aims at applying available knowledge to address environmental, economic, and social sustainability from farm to post-production processes of agricultural commodities. Such practice then translates into safe and quality food products.

In the Philippines where people rely heavily on agriculture for food and income, there is a need to implement food safety assurance systems such as GAP. Yet, even with the implementation of the Philippine Good Agricultural Practices (PhilGAP) in 2005, the country remains to be deficit in producing export-quality products. This, according to experts, is attributed to the high cost of production and safety standards accreditation of most food producers and manufacturers.

The Bureau of Agriculture and Fishery Standards (BAFS), in collaboration with the Bureau of Agricultural Research (BAR), through the Asian Food and Agriculture Cooperation Initiative (AFACI) program conducted the project titled, "Developing Locally-Appropriate GAP Programs and Agricultural Produce Safety Information System in the Philippines," that aims to conduct a value chain analysis report of a specific agricultural commodity; develop a crop-specific traceability tool; and, develop training modules and capacitate technical personnel from the regions as compliance officers using the traceability tool.

Traceability, a tool that helps in mapping the movement of a fresh farm produce along the supply chain, is proven to help the stakeholders in determining the origin of a food product sold in market outlet and identifying the possible source of hazard

Localizing GAP
FOR HEALTHIER, SAFER FOOD

Daryl Lou A. Battad

contamination in case of a food-borne disease outbreak. In the Philippines, however, traceability of fresh agricultural produce continues to be one of the major challenges especially during PhilGAP certification.

According to project leader and principal investigator, Mary Grace Mandigma of BAFS, "most farmers either have a hard time keeping an updated record or they do not keep any record at all." She added that "some farmers are only accustomed to 'calendar recording', a method farmers use to indicate their farming activities and other relevant records using a calendar. Record-keeping, for the farmers, only adds to the work and takes time to put in place."

With this project, Mandigma reiterated that putting a traceability program in place enables products to be easily traceable, thereby reducing market risk, and potentially affected products easily contained, controlled, or removed from the market.

An electronic-based traceability tool was put up where in critical yet basic data can be found such as the farmer's profile, cultivated land profile, farm labor, farm activities from land preparation to harvest and delivery, commodity profile (resource type, content, price, quality), as well as trainings, market actors, and certification bodies involved.

Further, there are nine regional GAP teams established from CAR, Ilocos, Cagayan Valley, Central Luzon, CALABARZON, Bicol, Northern Mindanao, SOCCSKSARGEN, and CARAGA regions.

In addition, the Philippine National Standard-Code of Hygienic Practice (PNS-COHP) for *gabi* leaves was developed under the project with partners from the Department of Agriculture-Regional Field Office (DA-RFO) 5, Central Bicol State University of Agriculture (CBSUA), and Bicol University-College of Agriculture and Forestry (BUCAF). In essence, the PNS-COHP addresses the essential principles of food safety applicable to primary production, postharvest, transport operations, primary processing and its subsequent storage. It encompasses GAP, Good Hygienic Practices (GHP), and Good Manufacturing Practices (GMP) that will help minimize microbial hazards associated with all stages of production and primary processing of *gabi* leaves.

With the project coming in full circle as it continuously fulfill its ultimate goal, the project is set to give more emphasis on marketing linkage, capacity building, and information dissemination, soliciting involvement both from the public and private sectors.

Finally, an increased appreciation from the stakeholders on various GAP standards with highlights on its relevance to food safety and market access is the project's main priority, because after all, food safety plays such an important role in the agriculture sector.

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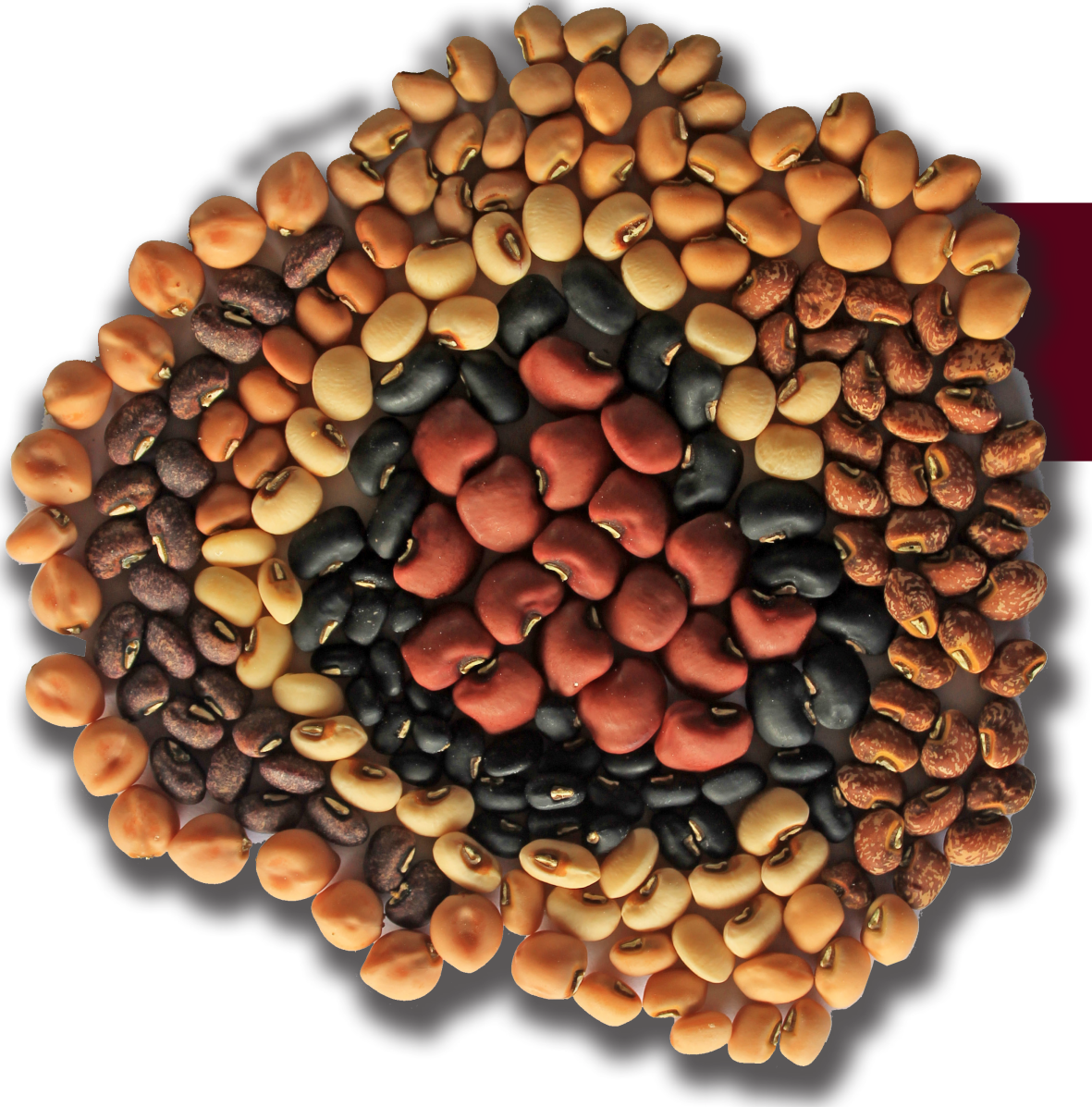

Legumes are important agricultural crops grown for its many uses: human foods, animal feeds, cover crops, relay crops, and green manure crop. As food crop, they are grown for their grain seeds including peas which are important sources of proteins, oil and Vitamin B.

In the Philippines, legumes are commonly used as vegetable crops. Some common legumes are cowpea (*Vigna unguiculata*), stringbean or yardlong bean (*Vigna unguiculata* ssp. sesquipedalis), mungbean (*Vigna radiata*), ricebean (*Vigna umbellata*), and pigeon pea (*Cajanus cajan*).

Among the legume crops, stringbean or "pole sitao" is the most popularly grown because of the pods, young shoots and beans that are available throughout the year. It grows around paddy fields, partially shaded areas, or even in home gardens. They can also be an excellent intercrop for annual crops.

Cowpea or locally called "paayap" is a warm season crop and cannot tolerate heavy rainfall. It can adapt to different types of soil and is also good in intercropping systems. It is resistant to drought and can improve soil fertility and prevent erosion.

Mungbean or "balatong" is another famous legume crop in the country. It is an important food ingredient for local Filipino dishes including soups, porridge, bread, noodles and even ice cream. It is a crop that fits in various cropping systems as an intercrop, rotation, and relay crop.

Not as popular and often times, underutilized, rice bean or sometimes called "tapilan" is a multipurpose legume. Although less important than the first three legume crops, rice bean is an important contributor to human nutrition. All parts of the rice bean plant are edible and used in culinary preparations. The dry seeds can be boiled and eaten with rice or they can replace rice in stews or soups. Young pods, leaves and sprouted seeds are boiled and eaten as vegetables.

Meanwhile, pigeon pea

Keeping the beans addressing the future

Rita T. dela Cruz

or "kadyos" is considered a minor crop in the Philippines and is usually grown in backyards or a portion of the farm. It is a crop suited for dryland agriculture and is protein-rich human food. Young pods as well as mature green seeds are cooked in dishes together with other vegetables.

Some legume crops are considered traditional food because they are essential for rural subsistence, livelihood, and health. Unfortunately, over the years, some farmers have shifted to other profitable crops leaving old cultivars such as pigeon pea until such time that they have been completely replaced. With farmers no longer planting and producing legume crops, slowly, they will be diminished.

To address this, the National Plant Genetic Resources Laboratory (NPGRL) of the Institute of Plant Breeding-University of the Philippines Los Baños (IPB-UPLB), is implementing a project "Collection, characterization and distribution of *Vigna sp*. and pigeon pea germplasm to promote use in the Philippines". The project is being funded and supported by the Asian Food and Agriculture Cooperation Initiative (AFACI), based in Jeonju, Korea.

The project, also referred to as the Integrated Management System of Plant Genetic Resources (IMPGR) project is under the Basic Agriculture program of AFACI. According to Maria Lea H. Villavicencio of NPGRL-IPB and IMPGR principal investigator (PI), the project has three objectives: 1) increase the germplasm collection and increase utilization of germplasm of cowpea, mungbean, other *Vigna* species and pigeon pea; 2) assess the diversity, identify and multiply promising accessions; and 3) document all the information gathered in a database system, promote the importance through publications.

Villavicencio mentioned that given the importance of legume crops in the Philippines, it is crucial that the germplasm of these species, particularly the traditional varieties, to be properly collected, characterized, and conserved to select and disseminate promising accessions for present and future use.

"In the Philippines, the national genebank or the NPGRL

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PHOTOS: © LVILLAVICENCIO/NPGRL

holds the significant germplasm collections of legumes including the *Vigna* species and pigeon pea," reiterated Villavicencio.

The NPGRL is the Philippines' germplasm bank of economically important plants in Asia and in Southeast Asia. The genebank houses a diverse collection of useful, traditional, and wild varieties as genetic resources for breeding new improved varieties. "To date, NPGRL holds 9,161 accessions of selected *Vigna* species and pigeon pea," Villavicencio reported.

Among the activities of the IMPGR project include strengthening the plant genetic resources (PGR) network of food legumes, conserving the diversity of traditional *Vigna* species and pigeon pea, and establishing database management and publishing information, education communication (IEC) materials and scientific paper.

Villavicencio reported that for the first year of the project, stakeholders have been identified and inventory survey forms have been developed. Likewise, collections were conducted in three provinces leading to accession of 15 pigeon pea, 5 cowpea, 1 mungbean, 7 yardlong bean, and 6 ricebean.

It was observed that our traditional mungbean varieties are becoming a rare find due to genetic erosion.

Viability test was done on germplasm of pigeon pea. From the 199 accessions, only 38 germinated. These germinated seeds during viability test were saved and planted individually in plastic bags and were eventually planted in the field for regeneration, characterization and evaluation. Initial characterization of pigeon pea showed diversity in terms of flower color, pod and seed shapes, and color. Meanwhile, the characterizations of cowpea and mungbean are still on-going.

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Monitoring pest outbreaks and reducing rice production losses

Patrick Raymund A. Lesaca

One constraint that impedes rice production in Asia, including the Philippines, is rice planthoppers (RPH) such as brown planthopper (BPH), small brown planthopper (SBPH), and white-backed planthopper (WBPH). Studies revealed that WBPH can also transmit a new virus called Southern rice black-streaked dwarf virus (SRBSDV) also known as RBSDV-2, which is problematic in some rice producing countries in Asia.

The continuous crop monoculture of high-yielding varieties coupled with high fertilizer rate, unnecessary usage of pesticides and the changing cultural practices, implicate abruptly the development of virulent BPH populations which leads to breakdown of the major genetic resistant varieties.

The question is, can we totally eliminate the threat or perhaps reduce rice damages? Which part of research and development equation is more important for adaptation, and how to proceed with it?

To find out, Dr. Genaro Rillon and a group of researchers from the Philippine Rice Research Institute (PhilRice) worked on a research study on Integrated Pest Management (IPM) that is closely associated with the management of RPH and associated viruses across the regions. The study is funded by Korea's Asian Food and Agriculture Cooperation Initiative (AFACI).

The project titled "Construction of Epidemiology Information Interchange System for Migratory Disease and Insect Pests in Asia Region: Assessment of Rice Planthoppers Populations and Viruses in the Philippines," was established to intensively

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monitor RPH and other related viruses causing significant rice production losses in Asian countries. Results then will be shared through the internet platform of the Asian Migratory Insects and Viruses Surveillance (AMIVS), web-based portal system designed as a depository for valuable information and a monitoring system.

The goal of the project is to reduce the vulnerability of rice crops to prevent losses caused by RPH pest outbreaks in the Philippines. It is also necessary to participate in the establishment of an international cooperative network for the best management of migrating RPH and associated rice viruses in Asia as a whole. The outputs of the project will contribute to the development of an efficient management strategies for impending outbreaks in the country.

Monitoring and damage assessment

As cited by Dr. Rillon, during the 2010 wet season, planthoppers have damaged about 6,000 hectares of rice in Iloilo and close to 40 percent of the area had significant losses. Rillon added that RPH associated hopperburn damages were regularly being observed in farmers' fields.

It is necessary to closely monitor the occurrence and populations of these planthoppers, as well as assess the damages. And thus, a monitoring system was installed in PhilRice, Science City of Munoz, Nueva Ecija, in 2014.

The weekly monitoring was conducted from 2014 to 2016. Collected samples then were brought to PhilRice laboratory for identification, counting and recording of trapped BPH and WBPH including spiders.

Based on the light trap catches, there was an increasing trend of population of BPH from 2014 to 2016. There were 1.09 and 7.38 percent more BPH in 2015 and 2016 respectively, as compared in 2014. In the case of WBPH, this increased by 3.47 percent in 2016. The contributing factors, as reported by the researchers, could be excessive use of insecticides and synthetic fertilizers; changes in usage of varieties and intensity of cropping; and other practices.

During the 2016 dry season, planthoppers caused 10 to 15 percent hopperburn damage in about 2,000 hectares in Nueva Ecija. Most rice plants showing damage were at soft dough stage or about to be harvested. The observed hopperburn occurred when light trap catches were high. Also, during the Farmers' Field Day held in PhilRice last March 31 to April 1, 2016, aside from farmers from Nueva Ecija, participants coming from nearby provinces of Tarlac (Anao, La Paz, Victoria and Capas) and Pampanga (Candaba) reported problems on hopperburn in their fields.

These observed high populations of RPH monitored using sticky trap coincided with the reproductive to ripening phases of rice plants in the field. It was further observed that planthopper adults invaded rice at reproductive phase and seems that they invade rice earlier during wet season. For both dry and wet seasons, monitoring showed that white-backed planthopper was usually recorded earlier to colonize rice plants than brown planthopper. During the field samplings, spiders, coccinelids, mirids, and tiger beetles were commonly observed in the field.

The population patterns observed would indicate that RPH develops in the field and peaked towards the end or as the crop neared maturity during the dry or wet seasons. Comparing these two population peaks recorded, higher peak of population occurred in wet season as compared with dry season. However, Dr. Rillon also pointed out there was an increasing trend in the number of planthopper populations recorded and its associated hopperburn damage in some areas in the Nueva Ecija.

Recommendations and other researchable areas

Although the damage was not in serious outbreak proportions, the continued observations of these pests in the field will indicate the necessity to continually monitor and analyze current scenario to prevent infestation outbreak in the future.

It is also necessary to study the changes in the practices of farmers like insecticide spray, nutrient application, variety usage and intensity of planting that favors the development of planthopper populations in the field.

Dr. Rillon, who was named Outstanding Principal Investigator in September 2016, reported the findings of his research team to the AFACI and was able to share valuable information through the AMIVS internet platform.

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Standardizing postharvest practices through AFACI's published manuals

Ephraim John J. Gestupa

With the world's population increasing at a rapid speed, it is becoming more apparent that the one earth cannot provide for the 7 billion humans that inhabit the planet. If we want future generations to live in the same favourable conditions we are currently experiencing today, conservation should be of utmost importance. The Philippines and most countries across Asia are fortunate enough to have a climate that is not too harsh for farming to flourish.

Whether it be tourist or local, everyone who has been to the Philippines can most likely recall the country's delicious mangoes and bananas. Yet in tropical countries like ours where agriculture covers pretty much the entire rural landscape, great yields come at the cost of postharvest losses: tons of it.

Dr. Perlita Nuevo, assistant research professor from the University of the Philippines Los Baños (UPLB), has been out in the field long enough to know how the farmers work teeth and bone to get their harvested crops delivered to the market, fresh and in good condition. She mentions that, we owe it to our hardworking farmers that the crops they reap are not wasted. Allowing crops such as cabbages, tomatoes, and bananas reach the packing stations only to be thrown away for having avoidable damages is a huge issue that can be easily addressed with proper postharvest technology.

Seeing the need to reduce agricultural waste in the Philippines and in other Asian countries, the Asian Food and Agriculture Cooperation Initiative (AFACI) came up with a plan to conduct research initiatives that would assess the postharvest practices across member-countries. The final output of these researches would then be published manuals which would direct the farmers themselves, both small scale and commercial scale, to a more standardized approach to postharvest practices.

Nuevo, together with the other 12 principal investigators from AFACI member-countries, partnered with AFACI in drafting a research project that aims to publish manuals that will guide farmers in adapting postharvest technologies when farming horticultural crops such as tomato, cabbage, pepper, mango and banana. With AFACI being a multinational, multilateral organization, the research is being implemented not only for the stakeholders in the Philippines but also in Korea, Bangladesh, Cambodia, Indonesia, Korea, Laos, Mongolia, Nepal, Sri Lanka, Thailand, Vietnam, and Kyrgyzstan.

When AFACI requested the Department of Agriculture (DA) to designate experts to be the principal investigator (PI) who will contribute to the drafting of the manuals, the Office of Undersecretary Bernadette Romulo-Puyat tapped Dr. Perlita Nuevo of UPLB. Usec Puyat also then assigned the Bureau of Agricultural Research (BAR) to monitor the progress done by AFACI projects as well as manage the allotment of funds coursed from AFACI.

The first two manuals were research outputs from Phase I of the AFACI project titled, "Establishment of Network and Model Manual on Postharvest Technology of Horticultural Crops in Asia." The postharvest project started in 2012 and was completed in the first quarter of 2016.

In the three manuals published by AFACI, Dr. Perlita Nuevo and Dr. Matilde V. Maunahan from UPLB's Postharvest Horticulture Training and Research Center (PHTRC) wrote the chapters that highlighted the postharvest practices on tomato and Chinese cabbage in the Philippines. They identified how tomatoes and cabbages are harvested from the field up to when they are sorted out and transported to markets across the country. In their study, Nuevo and Maunahan identified points of improvement as to what containers would best maintain the quality of the tomatoes. They recommended that tomatoes be hauled using plastic crates and rigid cardboard boxes instead of bamboo baskets or plastic sacks. This is to avoid rejected fruits that are punctured, pressed, or cracked.

Cabbages on the other hand are best transported in crates instead of plastic sacks that offer no support. They also observed that cabbages in the Philippines go through many packing and delivery stations between the field and market. With the crops being repackaged and transferred to other vehicles, Nuevo sees a greater risk at postharvest losses.

For the third manual, the Philippines focused on banana while other member countries focused on mango, pear, or strawberry. From among the

three crops that the Philippines worked on, it is banana that was used for the second phase in collaboration with the industry.

Nuevo then proceeded to commence the project's second phase titled, "Application of Improved Postharvest Handling Techniques of Banana Grown by Farmers in the Philippines." For this research initiative, Nuevo and her team looked into the banana supply chain which starts from production in banana communities in Visayas and Mindanao.

Their mission is to equip the farmers and handlers with postharvest handling interventions that will maintain the quality of their harvested fruits up to the export market. According to Nuevo, farmers who plant fruits and vegetables lose an estimated 30-50 percent of their harvest due to the lack of awareness on the proper handling to maintain crop quality. Nuevo added that the quality of banana for the export market depends on factors like the system of postharvest handling and awareness of the handlers. Neglecting to consider these factors results in substantial fruit damage, high postharvest losses and consequently, less marketable supply of fruits. Appropriate postharvest technologies should be employed starting at the farm level to help reduce these losses.

Take organic banana for example. When farmers in Lake Sebu, South Cotabato transport their bananas to the buying station via horse ride, some of the fruits incur mechanical damages brought about by improper packaging container, the rugged terrain and poor road structure and the long distance between farm to market. Aside from preharvest defects, rejects are mainly due to mechanical injuries in the form of abrasion, bruises and cuts.

Prior to the research, farmers in Lake Sebu would make use of banana leaves as cushioning material whenever they transport their harvest to buying stations. But after visits to banana production areas as well as the conduct of farmers' training and budget analysis, Nuevo was able to conclude that postharvest losses can be reduced if farmers use polyethylene (PE) foam as the cushioning material instead of the banana leaves.

According to Nuevo, the use of banana leaves as cushioning material may not be a sustainable postharvest practice since the leaves are being sourced from younger banana plants that could possibly still yield more banana fruits. When farmers use dried banana leaves, they expose their harvested fruits to disease-causing microorganisms.

If farmers were to utilize PE foam on the other hand, they would only need to keep it sanitized for it to last a year's worth of harvest. "One piece costs 1.10 pesos and can be used for as long as 1 year on a bi-weekly basis," said Nuevo.

Today, AFACI has already published three manuals on the postharvest practices for tomato, chili pepper, cabbage, banana, mango, strawberry and Asian pear grown in different Asian countries. The Philippines has contributed a chapter in each manual, thanks to Nuevo and Maunahan. These manuals are now being disseminated across the country along with compressed versions of the manual written in vernacular.

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ATIN: Besetting challenges in agriculture sector

Anne Camille A. Brion

One of the primary objectives of the Asian Food and Agriculture Cooperation Initiative (AFACI)-Agricultural Technology Information Network (ATIN) in Asia is the establishment of a standardized network. It is composed of a web-based information database system that allows and facilitates information and knowledge sharing in agriculture and fisheries among member-countries.

Under the ATIN project, member-countries are expected to contribute agriculture-related information and technologies to the AFACI-ATIN standard web platform; hold an annual evaluation meeting of AFACI projects being implemented in each respective member countries; and publish and reproduce agricultural books, manuals, crop calendars, and other related materials which will provide information about relevant research outputs and the latest agricultural technologies.

For more than seven years now, the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA) serves as the partner organization for the Philippines under the ATIN project. One important activity under this initiative is the updating and populating the AFACI-ATIN web-based platform through the uploading of information materials with topics that are related to agriculture and fisheries. Believing that information sharing offers a wide range of solutions to challenges besetting the agriculture sector, the database is seen as a tool that can help the member-countries enhance agricultural development through access to agri and fisheries information and knowledge.

Inside the ATIN database

The ATIN database can be found under the "Publications Category" of the AFACI website (www.afaci.org). Contained in this database is a variety of agriculture-related information from each member-country. Specifically, one can access and download materials such as brochures, manuals, and flyers on the various aspects of farming management of a particular member country, including success stories stemming from the adoption of best agriculture practices.

Also featured in the ATIN database are crop calendars of selected commodities. Such kinds of calendars help farmers in their farming endeavors as they contain information about planting systems, fertilization, and pest management under different growth stages – including the associated infestations and diseases for the selected commodities alongside their control measures. Some of which have been translated to local dialects to suit the farmers' communication needs.

Realizing the importance of the ATIN initiative in contributing to growth and development, the ATIN-Philippines, through BAR, further strengthened the content build-up of the database. This was evident in the increase of the uploaded information materials from merely 10 crop calendars in October 2013 to 60 information materials on various agricultural commodities including repackaged crop calendars, technology flyers and brochures, and success stories – uploading of which started from February 2017 up to the present.

Apart from the ATIN database, BAR likewise populated AFACI's News Media with related articles that have AFACI involvement. From the three articles posted in 2016, there are now 11 news articles from the Philippines under the news media category. Among those included are the conduct of the Annual Evaluation Meeting, and the series of seminars wherein the information materials being distributed to the participants were reproduced through the support from AFACI.

With the continuous and strengthened population of the AFACI web-based platform, the ATIN-Philippines through BAR remains committed in contributing to one of AFACI's core objectives, that is, to efficiently share agricultural knowledge, technologies, and experiences among member countries towards achieving sustainable agricultural growth and economic development in the Asian region.

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DISSEMINATING AFACI-generated technologies

Leoveliza C. Fontanil

Whether it's through seminars, agriculture exhibits, farmers' field day, or as mainstream as a television program, there are various ways and means to populate information to the public and ensure that relevant learnings are channelled to the public.

Information plays a key role in agricultural development. Through effective means, information can help facilitate mutual understanding among farmers, agricultural scientists and extension workers, and other stakeholders in improving people decision-making, enhancing efficiency and providing a competitive edge. Knowledge and information are basic ingredients for increased agricultural production and productivity.

Information dissemination is considered as one of the most important resources in agricultural growth that helps farmers and other users to make informed decision and appropriate actions for further development related to farming.

Establishing effective information channels

In providing relevant information to the farmers, public and private sectors, the Bureau of Agricultural Research (BAR), through its Applied Communication Division (ACD) established various channels to bring relevant information where they are needed the most. These include printing of information, education and communication (IEC) materials, distributing various handbooks and technology guide, packaging of technologies in compact disks for easy access, and providing crop calendar materials, among others. These materials were produced through the assistance of the Asian Food and Agriculture Cooperation Initiative (AFACI) mainly to populate technologies and best practices thereby contributing to food production and sustainable agriculture in the country.

As the importance of dissemination becomes increasingly recognised, BAR is also using innovative platforms – including websites, videos, meeting, conferences, seminar, and even agricultural exhibitions and other forms of reporting to reach specific segment of the audience.

One of the strategies that BAR taps in enhancing the information and knowledge sharing in agri research and development (R&D) is conducting in-house and regional seminars. This is a monthly activity of the bureau, where different commodities are being focused out of its various research supported projects. To date, a total of 1,354 in-house seminar participants and 213 regional seminar attendees were provided applicable information which they can readily use and apply through technology guide, brochures, flyers and crop calendar, among others.

In June 2017, BAR, in cooperation with AFACI, also handed out information materials, including DVDs on mushrooms and production manuals, to over 800 Overseas Filipino Workers (OFW's) participants in Hong Kong. The distribution of information materials was part of a two-day seminar activity on mushroom production conducted by Philippine Overseas and Labor Office (POLO) in partnership with the Department of Agriculture - Philippines in Hong Kong.

A BAR seminar also highlighted generated technologies from the AFACI-funded project, "Promotion of Vesicular Arbuscular Mycorrhizal Root Inoculant (VAMRI) in Regions IVA and IVB in Different Cropping and Plantation Systems" by Dr. Marilyn Brown of the National Institute of Molecular Biology and Biotechnology (BIOTECH) of the University of Philippines Los Baños. The project aimed to promote the utilization of VAMRI and its efficient use as biofertilizer in managing soil nutrients and establishing a system for organic resource. The learning session conducted on VAMRI was disseminated to over 120 seminar participants and benefitted more farmer-attendees in terms of earning higher profit from their produce, and lowering cost of farm production by using the technology.

Mass media also play a significant role in disseminating information on agricultural development. One of its powerful channels is through the use of television. Recognizing the contribution of television in faster transmission of information on agri-fisheries technologies provides

easier adaptation among farmers in the community. Through a collaborative effort of BAR with PTV 4's *Mag-Agri Tayo*, a public service and agricultural show in the Philippines, the television program featured the AFACI-funded project, "Genetic Improvement for Upland Rice through MAS for Tolerance to Phosphorous Deficiency" led by Dr. Victoria Lapitan of the Philippine Rice Research Institute (PhilRice), Los Banos.

PTV4's *Mag-Agri Tayo* highlighted the use of elite/ outstanding breeding lines of rice variety that are adapted and acceptable to upland conditions, resulting to higher yield than the current level and tolerant to P-deficient soil. This technology is in line with the effort of the Department of Agriculture in achieving rice self-sufficiency and boosting upland rice-based farming in the country.

BAR also made use of different international and local agri-exhibitions that it participated in to promote technologies generated from AFACI projects.

Specifically, in March 2017, by participating in the International Conference on Food and Agriculture (ICFA), BAR distributed IEC materials featuring AFACI-assisted projects and initiatives. To date, around 1,260 participants of the National Science and Technology (S&T) Week Trade Expo and 652 participants of the 56th Philippine Association and Food Technologists' Annual Convention have also been provided with these materials.

BAR and AFACI also disseminated relevant information on farming technologies during the Yamang Lupa Program (YLP) Farmers' Field Day in Sta. Rita, Samar; and during the Organic Agriculture Farmers' Field Day in Pangasinan.

Farmer's Field Day

Exhibit

Seminar Series

Project Documentation

LOOKING INTO THE RIPPLE EFFECT OF AFACI PROJECTS

Rita T. dela Cruz

Food security and sustainable agriculture are two interlinked factors that have always been at the forefront of every development project that aims to address global hunger and overpopulation. As the world's population continues to rise, the need to produce more food intensifies. This further compels the farming communities to produce more, and the agriculture sector to be more competitive.

South Korea, through the Rural Development Administration (RDA), has been expanding its role as a donor in the Asian region by providing agricultural assistance in the form of technical cooperation projects that will impact the agriculture of the recipient countries.

One of the agricultural assistances that RDA extends to other Asian countries is the Asian Food and Agriculture Cooperation Initiative (AFACI). Established on 3 November 2009, this multilateral initiative is composed of 14 member-countries including Bangladesh, Bhutan, Cambodia, Lao PDR, Indonesia, Kyrgyzstan, Mongolia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam, and South Korea. Myanmar and Bhutan became AFACI's newest members in 2016.

Three years after it was launched, AFACI has been coordinating the implementation of 12 projects, namely: 1) Agro-meteorological Information for the Adaptation to Climate Change (AMIS); 2) Animal Genetic Resources (AnGR); 3) Asian Network for Sustainable Organic Farming Technology (ANSOFT); 4) Agricultural Technology Information Network in Asia (ATIN); 5) Cassava; 6) Good Agricultural Practices (GAP); 7) Integrated Management System of Plant Genetic Resources (IMPGR); 8) Integrated Pest Management (IPM); 9) Postharvest; 10) Rice; 11) Sericulture; and 12) Soil Fertility. Five of these projects have already been completed in 2015 while the remaining seven are still ongoing.

In 2016, two additional projects on Seed-Extension and Seed-Potato were implemented bringing the total AFACI projects to nine. These projects were classified under five major programs: basic agriculture (ANSOFT, IMPGR), food crops (Seed-Potato, IPM), horticulture (GAP, Postharvest), animal science (AnGR), and extension (ATIN, Seed-Extension).

Turning eight this November 2017, AFACI continues to strive harder in coordinating and supporting projects of member-countries in an effort to bring relevant impacts not only for the research and development (R&D) sector but more importantly, to the farming communities and industry.

To ensure that significant effects are trickled down throughout the Asian region, bringing agricultural technologies and innovations beyond borders, AFACI has been conducting periodic evaluation of its projects to assess its relevance, performance, efficiency and impact, including both the expected and the unexpected outcomes. Although the focus of evaluations can be social, institutional, or environmental, AFACI is looking more into

the economic impact as one of the most effective means to measure if a project has indeed improved the lives of people in terms of introduced new technologies and interventions. The purpose of assessing the economic impact of AFACI projects is mainly to identify changes in productivity that has been generated by the research effort and compare these benefits to the cost of the research.

The WorldBank mentioned that the key indicator of research efficiency is the internal rate of return (IRR) of the investment. It would usually take 5-20 years for economic impact of a successful research project to occur. The WorldBank furthered that a rough rule of thumb might be that projects could begin to have a measurable impact within three years, an adaptive research project within five years, and strategic research within 5-10 years. A successful basic research project may not even generate a specific tangible technology, yet can make a big contribution to the society.

AFACI is looking more into the economic impact as one of the most effective means to measure if a project has indeed improved the lives of people in terms of introduced new technologies and interventions.

A farmer-attendee gets different Crop Calendars during the farmers' field day held on 14 March 2017 at the Pangasinan Research and Experiment Center (PREC) in Sual, Pangasinan. The Crop Calendars were produced and packaged by the Applied Communication Division of the Bureau of Agricultural Research and were distributed, along with other IEC materials. These IEC were produced through the assistance of the Asian Food and Agriculture Cooperation Initiative (AFACI) to disseminate technologies and best practices in agriculture and help farmers and other users to make informed decision and improve their production and income. *(Photo by DRDeleon)*

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