Bureau of Agricultural Research

2017 Annual Report

Going the Extra Mile

Strengthening Resilience
in Agriculture and Fisheries R&D

About the Cover

The cover of the *2017 BAR Annual Report* features five overlapped leaves highlighting specific commodities that Agriculture Secretary Emmanuel F. Piñol instructed BAR to look into. Specific R&D initiatives were mapped out to look not only on their potentials but on how these commodities, through research, can provide better opportunities for the agriculture sector.

Among the specific commodities that were particularly addressed through R&D were: 1) looking into jute fiber as a source of material in sack cloth to increase by-product utilization and development; 2) utilizing banana stalk and water lily as extenders for ruminant feeds and as sources of fiber; 3) addressing onion armyworm infestation that devastated the main onion-growing areas in Central Luzon; 4) developing packages of technology for the processing of onion leaves into different products; and 5) improving the Red Spanish pineapple variety in terms of fruit size and fiber quality. These tailor-made responses were made on top of R&D activities planned for 2017.

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Message of the Director

Development in the agriculture and fisheries sector is defined to a large extent by how successfully and effectively much-needed information and knowledge are generated and applied. In the arena of R&D, the promotion of sustainable agriculture is achieved through the efficient delivery of research services and on how quickly the sector is able to respond to current and forthcoming challenges.

In order for an agency to effectively deliver, it must be resilient. Resilience is defined as the ability to respond quickly to change; it is a positive adaptation amidst adversity that takes place consistently over time.

BAR, as the country's lead agency for agriculture and fisheries R&D, has exhibited the trait of resiliency as it has allowed for adaptive changes and transformations given evolving conditions.

Initially, BAR's specific mandate was limited to the coordination of agricultural research. Eventually, its role was expanded, and strengthened, to coordinating and managing the R&D sector at both the national and regional levels.

In displaying resilience, BAR did not limit itself to just funding and coordinating research. It went beyond the whole spectrum of grants management and R&D coordination to ensuring that all

Proactive response to the challenges of our time

of the research-generated technologies and results are used at the grassroots level. This is continuously being realized through the implementation of the bureau's flagship programs, the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP). These programs work on the premise that technologies generated by participatory research shall be practically applied by the farming and fishing communities.

In the midst of a changing political climate, the bureau had to align its R&D priorities with the evolving thrusts of the Department of Agriculture which are anchored on food security and sustainable agriculture. And this has required "going the extra mile", of rendering special effort, in the name of bringing research that matter to the people.

In 2017, R&D proved to be a reliable arm of the DA in exploring and addressing issues related to food production, the development of innovative technologies, and crop protection, among others. Early in his administration, Secretary Emmanuel Piñol recognized the potential of research and how it can be tapped to address the various issues of the sector. This re-energized agricultural research and BAR anew.

Among the specific issues that were particularly addressed through R&D were: 1) looking into jute fiber as a source of material in sack cloth to increase by-product utilization and development, as well as reduce importation cost; 2) utilizing banana stalk and water lily as extenders for ruminant feeds and as sources of fiber, making the cost of feed cheaper; 3) addressing onion armyworm infestation that devastated the main onion-growing areas in Central Luzon; 4) developing packages of technology for the processing of onion leaves into different products; 5) improving the Red Spanish pineapple variety in terms of fruit size and fiber quality; and 6) producing clean planting materials of garlic through tissue culture.

Addressing these researchable areas has enabled BAR to be more responsive to the present and future needs of agriculture and fisheries, thus increasing its relevance with regard to urgency and requirement.

But these are just some of the highlights of the year that was. The R&D sector as encompassing as it already is, covered an even wider scope, ranging from technology generation to information dissemination. Through this report, we hope that we are providing a broader perspective as to how we delivered beyond what is expected of us as a funding and coordinating agency.

We humbly dedicate all our efforts and achievements to all Filipinos especially our farmers and fisherfolk. Let us work together in securing our future!

Dr. Nicomedes P. Eleazar, *CESO IV*

Introduction

As the new administration continued to ramify its roots in the Department of Agriculture (DA), Secretary Emmanuel F. Piñol has urged its officials and staff to go further to achieve more. In line with this, directives were given out to DA units and agencies on new concerns.

Special efforts were mapped out for the commodities identified by Secretary Piñol for BAR action that include onions, Red Spanish pineapple, banana stalks, water lily, and jute. These tailor-made responses were made on top of R&D activities planned for 2017.

The bureau funded research projects on onions for optimizing its uses and improving production technology. Closer attention was also given to address armyworms after the DA took cognizance of recent attacks that devastated the main onion-growing areas in Central Luzon. The bureau also took the initiative of holding discussions with local institutions and an international research agency, the Centre for Agriculture and Bioscience International (CABI), on how best to deal with the pest and plan the next activities.

Red Spanish pineapple is famous as the source of piña cloth for making *barong Tagalog*. Once a lucrative industry, it now seems that the growing of this variety is on its last years as the number of fiber suppliers has been dwindling. With the aim of increasing the profitability of the growers of this variety to encourage them to continue and improve production, Secretary Piñol tasked BAR and the Bureau of Plant and Industry (BPI) to lead research initiatives to improve fruit size and quality for farmers to make additional income aside from the fiber. BAR's contribution to the revival of the industry has been to identify R&D projects for Red Spanish pineapple fruit development while maintaining fiber production with DA-RFO 5, DA RFO 6, BPI, PhilFIDA, and ASU for implementation by specific R&D institutions.

Banana stalks become waste once the fruits are harvested. Water lily is considered a nuisance in freshwater bodies and waterways. These need not be the case as Secretary Piñol issued directives for the conduct of research on the utilization of dehydrated banana stalks and water lily as extenders for ruminant feeds and as sources of fiber, thus lowering the cost of feed and developing new fiber sources while eliminating unwanted plants or parts at the same time. Progress in research by various R&D partner agencies (PCC, UPLB, USM, PSAU, and PhilFIDA) is underway. A review and initial assessment was conducted by BAR and plans were unified and polished accordingly.

While it has not been a major industry, jute has been present in the country since the last century.

Going the Extra Mile

Strengthening Resilience in Agriculture and Fisheries R&D

With the aim of stimulating local jute fiber production, the Secretary instructed BAR and PhilFIDA to come up with plans for the development of jute as a source of fiber for sack cloth. The two agencies immediately began initiatives to rejuvenate the jute industry that will lead to job generation, improved farmers' income, increased by-product utilization and development, and dependence on other countries. DA RFO 5 is already at work on a project on production and marketing.

These are but a few instances of how BAR and the Agriculture and Fisheries Research and Development and Extension (A/F RDE) system are responding to current realities. At the same time, these also show that DA is placing a lot of trust in the bureau by giving it a greater role and responsibility in promoting farm productivity and profitability.

With the Secretary's emphasis on downstream research as the way to go, research directors and managers were encouraged to revisit and realign the research priorities of each region to be guided by DA policies such as the SAAD program, PCIP, and PRDP. For BAR, adjustments were made on its two flagship programs: CPAR and NTCP. A nationwide training on community organizing was also conducted to further elicit local participation in CPAR and improve the relevance of research.

There is still the need to invest in agricultural research not only to improve productivity and ensure our food security, but to confront head on the challenges of climate change and the combined impact of rapid population growth, diminishing natural resources, and decreasing size of Philippine farms. These raise the urgency for greater technology innovation in order for the country's agricultural production to move forward.

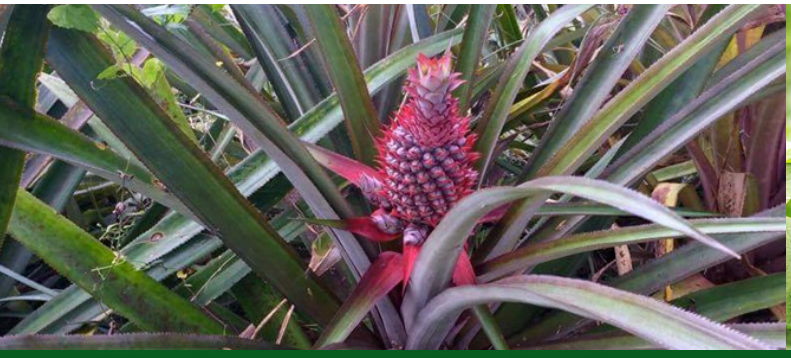
Quietly, BAR upped the ante with substantial improvements on the A/F RDE system. With the help of the bureau, all regions now have Organic Agriculture R&D Centers, 13 of which became operational by end 2017. Last year also saw the establishment of the 282nd CPAR site and more are planned for the future. In IT applications, BAR established the R&D Portal and the Compendium Database system that will generate useful information for various clients on completed R&D projects funded by BAR and maximized its use of social media.

The bureau successfully conducted the 13th National Technology Forum and the 29th National Research Symposium which saw an increase in paper entries. The bureau printed several publications, three of which are the "Compendium of BAR-Funded Projects under the National Organic Agriculture Program (2011-2016)", the "SOYAmazing Stories from the Field: Results from Soybean R&D Program" to inspire the country's soya farmers, and "A Decade of Success" which is a compendium of BAR-supported R&D projects from 2005 to 2014.

BAR also conducted a number of important workshops among which are on climate change and on high-value crops development for generating more specific listings of R&D projects, technologies and possible implementing agencies; financial viability and profitability analysis of new technologies and enterprises under the NTCP, and an IKM mentoring program that focused on the communication of agricultural research that were conducted to upgrade the DA's researchers. The bureau was able to boost attendance to its in-house seminar series following its endorsement by no less than Secretary Piñol.

These are a small part of the accomplishments of the bureau but are sufficient to show that BAR continues to provide effective leadership and guidance to the R&D system in creating technological impact on agriculture and fisheries and is making possible the sustained delivery of R&D services across the country, going out of its way when needed. With BAR "going the extra mile," the resilience of the A/F RDE system is assured.

BAR continues to provide effective leadership and guidance to the R&D system in creating technological impact on agriculture and fisheries...



Updates on Agriculture Secretary Piñol's Directives

RED SPANISH PINEAPPLE R&D

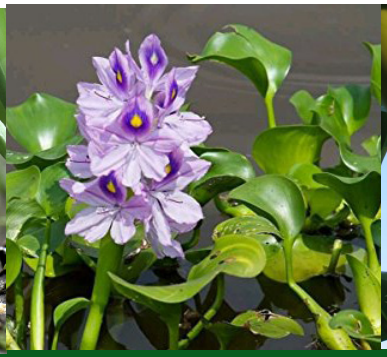
To improve the fruit size and fiber quality of the Red Spanish pineapple (RSP), BAR, in collaboration with BPI, DA-RFO 5, ASU, and PhilFIDA, came up with a mother research proposal that incorporated profiling of RSP production, cultural management studies, textile fiber production, and market research.

Specifically, the project titled, "Fruit Size and Quality Enhancement of Spanish Red Pineapple through Cultural Management Practices" took off in 2017 and is being implemented by DA-RFO 5 and ASU.

Presently, fiber from RSP leaves has higher demand than its fruit. With improved crop production management practices, the project hoped to improve both the fruit and leaf yield for optimum production and profit.

Significant Findings

- ASU sent 8,000 pieces of planting materials to DA-RFO 5 and submitted soil sample to BSWM in Iloilo City.
- As suggested by DA-RFO 5 and ASU adjusted its plot to the new layout design. Planting started in October 2017.
- Implemented cultural management practices including pest and disease control measures, weed control measures, and fertilizer management in the 2,500-square-meter site in Camarines Norte.
- Heart rot was evident in some of the planting materials thus, careful selection was ensured to avoid planting the damaged slips.
- Fertilizer application started five months after planting. The project is in the process of gathering agronomic data including plant height, number of leaves, length of leaves, and width of leaves.


JUTE R&D

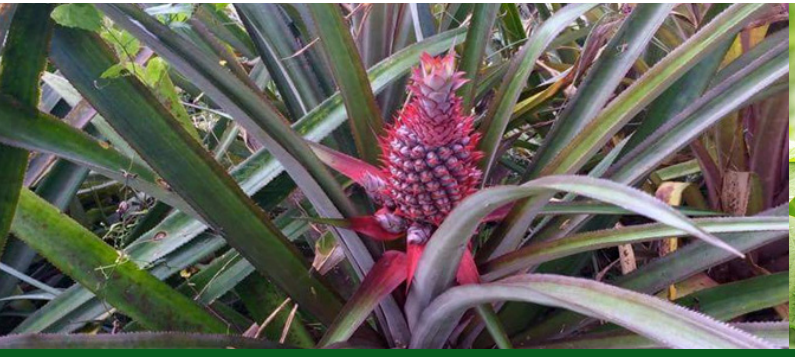
Aside from abaca, jute is one fiber that is now being widely-used as an effective packaging material for grain commodities due to its durability to maintain grain quality and keep the germination capability intact. It can also be reused multiple times proving beneficial for bulk postharvest handling of agricultural products.

In the Philippines, some of the major users of sack cloth are the coffee and cacao industries. Unfortunately, due to minimal production area for jute, the Philippines has to import this natural fiber to cope with the demand.

To address this, a study on the "Assessment on the Utilization of Jute Sacks as Packaging Materials" implemented by PhilFIDA was initiated in 2017. The study aims to provide the government, as well as prospective investors, the needed information on jute fiber production for policy formulation, decision-making, and identification of needed interventions for jute production especially as a packaging material.

Significant Findings

- Seeds of existing jute varieties from Nueva Ecija, Ilocos Norte, and Camarines Sur were collected and were being grown at PhilFIDA nursery for cultivation and extraction.
- Results showed that jute production in Ilocos Norte and Nueva Ecija is used for vegetable consumption only (*saluyot)*. However, DA-RFO 5 was able to extract jute fiber through retting but the quality is not comparable to that of the commercial jute fiber.
- Recommended areas for trial planting in PhilFIDA seed banks/ stations were identified in Kalawit, Zamboanga del Norte; Casiguran, Sorosogon; Batac, Ilocos Norte; Sta. Barbara, Iloilo; and Victoria, Oriental Mindoro.
- According to the "PhilFIDA Technology Guide on Jute", past local technologies on fiber extraction include retting and decortication. Currently, retting and scraping are being practiced.
- There is currently no identified jute fiber extractor for commercial purposes.
- Two varieties of jute: *Corchorus capsularis* L. (white jute) and *Corchorus olitorius* L. (dark/red jute) were planted in July 2017. The total area planted was 3,400 square meters.
- After 3-4 months from seed propagation, the jute plants were harvested using a *bolo* or sickle. They harvested around 12,500 plants in a 250-square-meter field.
- Conducted on-going study on the enhancement of jute seeds and development of farming practices that would lead to quality jute products.



Updates on Agriculture Secretary Piñol's Directives

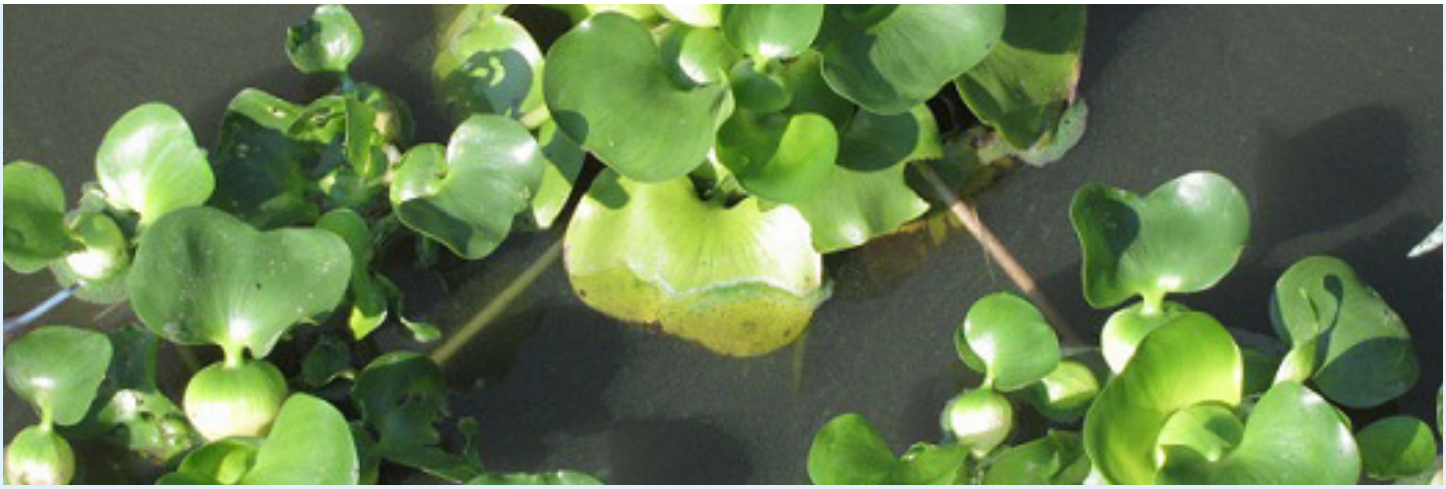
BANANA STALK AND WATER LILY R&D

The scarcity of feed resources due to low land holding in backyard ruminant production resulted in the search for alternative ingredients. Banana stalk as a by-product of banana production is a potential source of Neutral Detergent Fiber (NDF) while water lily is an invasive aquatic plant that can supply dry matter for ruminant animals especially for dairy. As such, a study titled "Feeding Value of Banana (*Musa sapientum*) Stalk and Water Lily (*Eichhornia crassipes*) (Mart.) in Dairy Cattle" is being implemented by UPLB.

Significant Findings

- As for dry matter basis, use of banana stalks and water lily as feed ingredients is comparable to Napier grass which is the conventional feed source to cattle.
- It was found out that banana stalk, water lily, and Napier had the same soluble dry matter (DM) and NDF fractions while water lily had the highest soluble crude protein (CP) fractions among the three samples. Napier had the highest soluble organic matter (OM) fractions and potentially digestible OM fractions.
- Potentially digestible OM fractions of water lily was comparable with Napier grass. Water lily can be utilized as feed for dairy cattle given the higher CP soluble fractions in the rumen.
- Despite speculations that water lily may contain considerably high concentrations of heavy metals such as Lead and Cadmium, analysis of samples did not detect such metals.
- Partial results on the economic analysis of feeding banana stalk and water lily to dairy cows showed highest average feed cost in banana stalk in milking cows. Inclusion of water lily or banana stalk in place of Napier grass generated higher income as compared to feeding dairy cows with Napier grass alone.

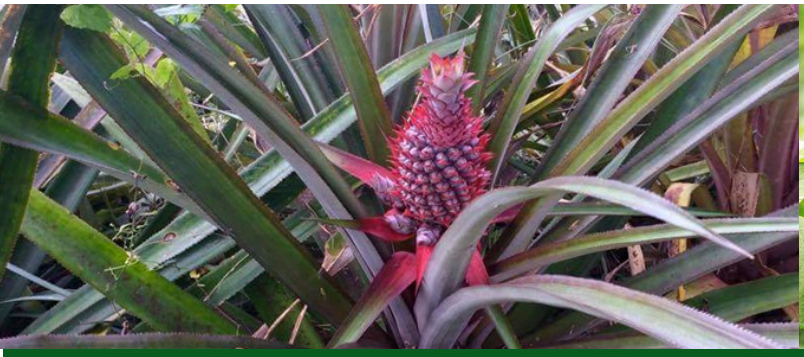




The effort to explore alternative feed sources through the use of banana stalks and water lily will help address deficiency in nutrients required by animal; for normal growth, reproduction, and milk production performance. These two feed resources are available, cheap, and can be practically used for ruminant feeding. To look into their potentials, PCC embarked on a study, "Nutritive Value, Digestibility and Performance of Buffaloes using Banana by-Products and Water Lily as Alternative Feed Sources".

Significant Findings

- Identified proximate composition of dehydrated banana stalk and water lily.
- Generated results on the *in vivo* digestibility and *in situ* nutrient degradability of the dehydrated banana stalk and water lily.
- The two feed resources (banana by-products and water lily) had very low DM contents which can be good ingredients for silage production in combination with dried fodder and concentrates such as rice straw, rice bran, or copra meal.
- Total mixed rations (TMR) using banana by-products produced higher average daily gain compared to other treatments after the three-month experiment.



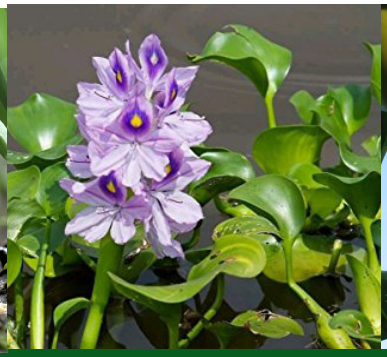
Updates on Agriculture Secretary Piñol's Directives

BANANA STALK AND WATER LILY R&D

Generating a technology that will utilize dehydrated and ensiled banana stalks and water lily as feed ingredients for goats, the project was set to accomplish baseline information on the volume and production areas of banana and water lily in Regions 1, 2, 3, and 4B. Such information can be used in furthering the policy on the utilization of the these commodities. PSAU is leading a study on "Volume and Availability of Banana and Water Lily and their Utilization as Feed Ingredients for Goats in Luzon".

Significant Findings

- Generally, the Cagayan Valley region has the highest volume of banana production among the other regions in Luzon; Oriental Mindoro has the largest banana production area.
- Dumping is the most common waste management practice of banana in Luzon. However, most provinces have no technology on the utilization of banana waste although there were some that utilized it for fertilizer, mulching, bagging for mushroom, food wrap, and substrate (using banana leaves).
- The provinces that have the largest prevalence of water lily include Rizal, Pampanga, and Laguna. The Department of Trade and Industry and the Villar Foundation assisted communities with water lily for the development of handicrafts.
- Based from experiment results, water lily samples used for feed utilization were negative from Lead and Cadmium contamination.


The data on the volume and availability of water lily and banana will be used as basis for the proposed productivity and commercialization of these commodities. USM is implementing "Volume and Availability of Banana and Water Lily and their Utilization as Feed Ingredients for Goats in Mindanao" that is targeted to address the limited feed sources and scarcity of good forages that have jeopardized the fast economic gains on goat farming.

Significant Findings

- In Region 11, the volume of production for *Lakatan* is high in Davao Oriental; Cardaba in Davao Occidental and Davao del Sur; and *Cavendish* in Compostella Valley.
- In Region 12, the volume of production for *Cardaba* is high in Cotabato province. Banana stalks are used as padding and mulching materials in banana production.
- Data of about five hectares of water lily was recorded in Liguasan Marsh in Mindanao.

Despite the numerous products which can be made from banana stalks and water lily, the lack of sustained local and foreign market demands, as well the low farm income and productivity hinder their continuous commercial utilization. To address various issues confronting the industry, PhilFIDA is implementing, "Situational Study on the Potential Use of Banana Stalks and Water Lily as Source of Fiber" have jeopardized the fast economic gains on goat farming.

Significant Findings

- Davao del Norte, Bukidnon, Maguindanao, and North Cotabato are the top provinces in Mindanao that have the largest production areas of banana. In general, Mindanao has the highest banana production areas with possible sources of fiber. Davao del Norte was recorded to have the largest among the provinces, with 36,368 hectares.
- Although Mindanao has the highest banana production areas, it showed that Luzon, specifically in Isabela and Oriental Mindoro, has higher amount of potential fiber production as per validation of effective production areas for fiber.
- Based on the data gathered, most of the problems encountered by banana stalk processors were lack of knowledge for the fiber processing technology, and inability to market the products. Possible solutions and interventions such as proper training and provision of machineries and sustainable market were recommended.

Updates on Agriculture Secretary Piñol's Directives

ONION R&D

Onion is a popular and commonly-used main ingredient or condiment in every cuisine. But beyond its common use as ingredient in preparing food, onion has other potential uses. In response to the directives of Agriculture Secretary Piñol to explore possible research interventions in using and processing of onion leaves and shallots instead of seeds for onion production, BAR, in collaboration with various agencies, embarked on various R&D initiatives on onion.

Development of Products from Onion Leaves Towards Increased Farmers' Income

Implemented by CLSU, the objective of this research is to conduct resource and crop suitability assessment of onion biomass wastes specifically, onion leaves to produce accurate and high resolution onion resource maps of the Philippines resulting to the development of onion carbonizing machine and briquette from onion leaves.

Significant Findings

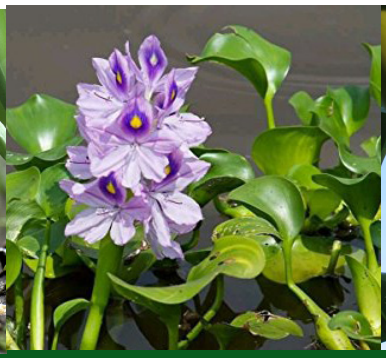
- Completed the initial onion biomass assessment.
- Generated high resolution digitized maps of onion growing areas in Nueva Ecija, Pangasinan, Tarlac, Ilocos Sur, and Ilocos Norte.
- Generated design concepts for onion leaves briquetting machine.

Development of Cost-Effective Seed Production Technology for Onions (SPOT)

One of the problems in onion production is limited and expensive planting materials especially at the time of planting. Commercial seed production of shallot varieties has not been exploited because of non-uniform-flowering characteristic of shallot varieties. As such, growers usually resort to use bulb in shallot, which oftentimes is a problem because of difficulty in storage and transmission of virus through vegetation propagation. This project, being implemented by CLSU, targets to develop and promote cost-effective and sustainable seed production technologies for onion.

Significant Findings

- Utilized different onion and shallots varieties including Batanes native, Batanes jumbo, Australian native, Australian jumbo, Tanduyong, and Red Pinoy.
- Optimized protocol in the storage of onions and shallots.


Increasing Farmers' Income through the Utilization of Waste Onion Leaves for Various Applications

Onion leaves, which are already considered as garbage, could potentially give farmers additional income with proper research and processing. This project, led by UPLB, aims to develop a package of technologies (POTs) for the utilization and commercialization of onion leaves into different products, providing additional income to farmers.

Significant Findings

- Gathered and consolidated onion production practices from land preparation, planting, fertilizer and cultural management, pest and disease management to harvesting and storage.
- Specific herbicides and pesticides used by farmers in Occidental Mindoro were determined.
- Identified POTs to be developed from onion leaves which include: pickled onion leaves, powdered onion leaves, chopped form (i.e. chives used as condiments), onion leaves extract, onion leaves tea, and vacuum-fried leaves.

Comprehensive R&D Program on Integrated Pest Management for Onion Armyworm

This research initiative is composed of six studies that address the infestation of onion armyworm. Closer attention was also given to armyworms after it devastated the main onion-growing areas in Central Luzon. BAR took the initiative of holding series of discussions and consultative meetings on how to best deal with the pest and plan the next activities.

Components/Studies under the Comprehensive Program on Onion		
Study 1a	Detection, Spatial Tracking, Damage and Yield Assessment and Mapping of Armyworm Infestations and Diseases of Onion Using Remote Sensing Technology	CLSU
Study 1b	Early Detection and Warning: Surveillance and Monitoring of Different Crops/Areas Affected by Onion Armyworm	UPLB
Study 2	Biological Studies of Onion Armyworm	UPLB
Study 3	Efficacy Test of Bio-pesticides and Microbials against Onion Armyworm	UPLB
Study 4	Insecticide Management and Resistance Studies in Onion Armyworm	UPLB
Study 5	Quality and Safety Assessment and Postharvest Behavior of Onion Grown under IPM against Armyworm	UPLB

Banner Programs

Two major programs – the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP) authenticate BAR's mission to attain food security and reduce poverty through technology-based agriculture and fisheries sector.

As the flagship programs of the bureau, CPAR and NTCP harmoniously cultivate and enhance the local resources of a farming community to bring about location-specific development and farmer empowerment.

As of 2017, BAR, through its Project Monitoring and Evaluation Division (PMED) coordinated 282 projects under the CPAR program, benefiting 13,669 farmers nationwide. Of the 282 CPAR projects, 243 focused on agriculture while the remaining 39 were on fisheries.

Facilitated by the Technology Commercialization Division (TCD), BAR supported 489 projects under NTCP, of which 41 are new and 56 are on-going.

Community-based Participatory Action Research

CPAR is a location-specific research cum extension program that deals with improved farming systems technologies. It aims to enhance the role of R&D in the transfer of various technologies to the farmers and fisherfolk. Considered as a downstream research, CPAR focuses on technology verification and adaptation in the community.

Major Activities

Seminar-Workshop on Community Organizing

PMED coordinated the conduct of a series of seminar-workshops on community organizing, participated in by 113 researchers from DA, BFAR, and LGUs nationwide. The activity aimed to capacitate CPAR implementers in all regions to ensure that the CPAR teams are fully equipped as they equally prepare the target communities in the introduction of agri-fishery interventions through CPAR. Among the covered topics were on concepts, strategies, and methods in the major phases of the community organizing process; sustainable livelihood and social enterprise development; and participatory rural appraisal.

CPAR Orientation in Samar

Samar was one of the three identified provinces in the Philippines that has not yet been reached by the CPAR program. This led BAR to introduce the CPAR program to 34 participants who attended the orientation representing 26 municipalities of the local government of Samar. Topics presented included the CPAR background and rationale; participatory rural appraisal; guidelines in availing CPAR grants; and preparing and packaging proposals for funding. The CPAR projects in the region will focus on various champion commodities of each municipality including *ubi*, ginger, rootcrops, and livestock and poultry.

Technologies Generated

CPAR deals with improved farming system technologies for specific micro agro-climatic environment within a province or a municipality. It focuses on technology verification, adaptation, and demonstration in the community.

Project Title:	**CPAR on Corn-based Farming Systems at Kadingilan, Bukidnon**
Implementing Agency:	DA-RFO 10, NOMIARC
Beneficiaries:	Farmers of Pay-as, Bagor and Salvacion, Kadingilan, Bukidnon
Project Site:	Pay-as, Bagor and Salvacion, Kadingilan, Bukidnon
Technology Interventions:	Use of certified corn seeds, organic fertilizer, Biocon (*Trichograma evanescens*), integrated nutrient management, crop+livestock (goat) farming system, and crop diversification

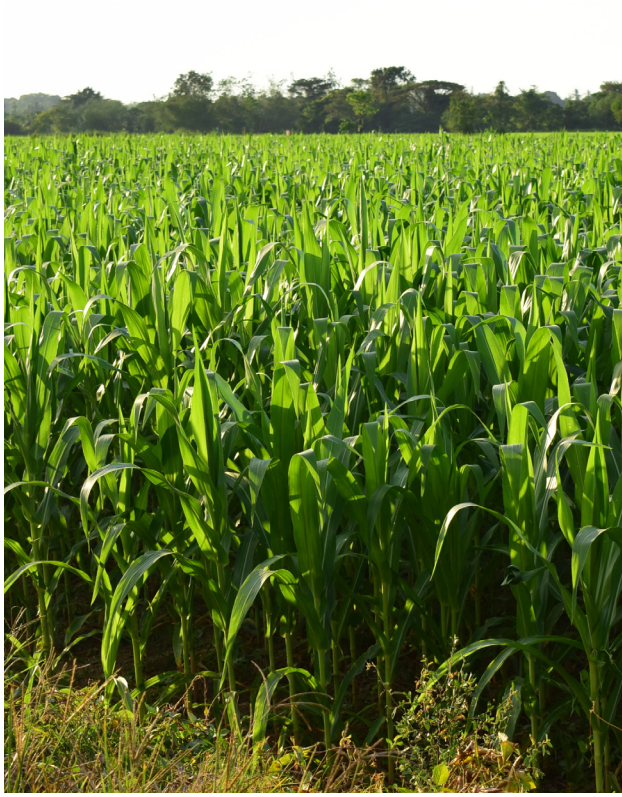
Project Title:	**CPAR for Coconut-based Farming Systems in Oroquieta City**
Implementing Agency:	DA-RFO 10, NOMIARC
Beneficiaries:	Coconut and vegetable farmers
Project Site:	Dolipos Alto and Dolipos Bajo, Oroquieta City
Technology Interventions:	Use of high-yielding and appropriate varieties, organic+inorganic fertilizers, integrated pest management, and integrated nutrient management

Project Title:	**CPAR for Vegetable-based Farming Systems**
Implementing Agency:	DA-RFO 10, NOMIARC
Beneficiaries:	Lowland vegetable farmers
Project Site:	La Fortuna, Impasug-ong, Bukidnon and Kibenton, Impasug-ong, Bukidnon
Technology Interventions:	Use of high-yielding varieties, organic+inorganic fertilizers, integrated pest management, and integrated nutrient management

Project Title:	**CPAR Program in the Province of Agusan del Sur**
Implementing Agency:	DA-RFO 13 (CARAGA)
Beneficiaries:	Farmers of El Rio, Mahayahay and Afga
Project Site:	El Rio, Mahayahay and Afga, Sibagat, Agusan del Sur
Technology Interventions:	Use of multi-cropping system, mixed fertilizer (organic+synthetic), and vermiculture

Success Stories

When matured technologies are tested and verified, these are disseminated to the community for adoption and for further expansion. In 2017, the following were the technologies developed and adopted through CPAR.



CPAR ON CORN-BASED FARMING SYSTEMS IN KADINGILAN, BUKIDNON

The technology interventions included the use of organic and inorganic fertilizer application, integrated nutrient management (INM), and integrated pest management using appropriate and improved varieties (Pioneer 30B80). The farmer-cooperators positively responded to the technology introduced. The introduction of INM, in combination with organic and inorganic fertilizers, was highly-appreciated by the farmers considering its good results in terms of crop yield. The use of inorganic fertilizer was also reducesd optimizing the benefit derived in using organic fertilizer.

CPAR ON ENHANCING WHITE/PURPLE CORN PRODUCTIVITY UNDER RIVER FLOOD AND DROUGHT-PRONE AREAS OF ENRILE, CAGAYAN

IES 10-04, a white corn variety developed by the DA-CVRC consistently out-yielded other open pollinated variety (OPV) white corn, resulting to a yield of 4,196 kg/ha and 2,933 kg/ha for dry season and wet season, respectively. During drought conditions, the improved cropping pattern under white corn intercropped with mungbean provided better income of about Php 27,990 (corn) and Php 18,082 (mungbean) versus the farmers' practice of Php 19,645 (corn) and Php 1,852 (mungbean). Another improved cropping pattern introduced under white corn and peanut intercropping also provided a higher income of Php 8,785 compared to farmers' practice of Php 362.50 during the dry season.

Success Stories

CPAR ON SUSTAINABLE CORN PRODUCTION IN SLOPING AREAS (SCoPSA) IN CORN-BASED HILLY AREAS IN MADDELA, QURINO

SCoPSA, a program developed by the DA, is part of its national advocacy to adopt soil and water conservation measures to address soil erosion, and to enhance productivity of corn farmers by the use of sustainable, adaptive corn technologies especially in sloping areas. The results of the CPAR intervention reflected a positive increase both in yield and income.

CPAR farmers acquired higher yield compared to their old practice, with an increase from 4.45 mt to 4.65 mt per hectare of corn production. Nestor Ruaboro, one of the farmer-cooperators, recorded an average yield of 4.45 mt/ha using farmer's practice. With CPAR SCoPSA, he was able to increase his yield to 9.10 mt/ha. Johny Ramos, a farmer-cooperator, did not expect such a significant income by simply the adopting a technology. He recorded an income increase from P1,366.82/ha to P10,347.00/ha

CPAR MODEL SHOWCASING MUNGBEAN GAP-BASED FOR IMPROVED RICE PRODUCTIVITY IN LOWLAND RICE-BASED AREAS OF CULING CLUSTER, CABATUAN, ISABELA

Ten farmer-cooperators got an average yield of 1,297 kg/ha in CPAR model farms as an effect of the different technology interventions applied. This is significantly higher compared to the 544 kg/ha mean yield derived from farmers' practice. The average yield difference of 653 kg/ha was translated to net change or added net benefit of Php 25,640.00. A field day was conducted in May showcasing the interventions applied in the techno-demo sites. The field day was participated by 100 mungbean farmer-adopters.

CPAR RICE-BASED FARMING SYSTEM (RICE + MUNGBEAN + VEGETABLE) IN SAN MIGUEL, ILOILO

The CPAR project aimed to enhance the productivity in rainfed rice-based farming by increasing yield in rice, integrating mungbean and vegetable production, and creating a diversified cropping system. Through this project, farmer-cooperators were provided with farming interventions including the use of Green Super Rice (GSR) varieties, Rice Crop Manager (RCM) tool, and Integrated Pest Management (IPM). Farmers were also taught on how to apply procedure in seeding rate, inoculation of quality seeds, and location-specific technologies using sustainable and diversified farming approaches for water- and cost-efficient crops. Mr. Moreto Satore, one of the farmer-cooperators in San Miguel, Iloilo, presented the results of his involvement in the CPAR project using the improved cropping system practices (rice + vegetables) integration. According to him, by using the technology introduced, it resulted to additional earnings of Php 9,224.00/ha for the first cropping season, a 23 percent increase compared to his old practice.

CPAR ON OFF-SEASON GAP-BASED PINAKBET VEGETABLE PRODUCTION IN SUPPORT TO THE FOOD TRADING BUSINESS IN ROXAS, ISABELA

An improved production technology with GAP-based production for off-season *pinakbet* vegetables was introduced and demonstrated in demo-farms in Simimbaan, Roxas, Isabela with 18 CPAR farmer-cooperators. Among the technologies or interventions introduced through the CPAR are: high-yielding varieties (ampalaya, eggplant, tomato, pepper, and pole sitao); Integrated Pest Management; fertilization technology (recommended rate of inorganic + organic). In a cost and return analysis data of the project, it was estimated that by planting mixed vegetables in a 2000-square-meter plot area, Benito Abes, one of the farmer-cooperators, earned a net income of Php 71,400 with a cost of production of Php 35,379. Meanwhile, Warlito Manipon, another CPAR farmer-cooperator, with his 3200-square-meter plot area planted with mixed vegetables, his cost of production amounted to Php 43, 343 but earned him a net income of Php 101,718. So far, both farmers who followed the CPAR technologies are now reaping the harvest of success.

National Technology Commercialization Program

NTCP highlights research breakthroughs and mature technologies generated and developed through research and development. It ensures that technologies are strategically placed and transferred to areas and communities that neede them the most. In essence, NTCP makes certain the transformation of agriculture and fisheries from resource-based to technology-based industries.

Major Activities

13th Agriculture and Fisheries Technology Forum and Product Exhibition

Held on 8-10 August 2017 at the BAR grounds in Diliman, Quezon City, the activity gathered 52 exhibitors from the DA and BFAR regional offices, state universities and colleges, and private partners. This year's theme focused on "Bringing Products of R&D to the Filipino Farmers, Fisherfolk, and Agripreneurs through Technology Transfer and Commercialization." Among the highlights of the event were the launch of the BAR R&D Portal; launch of the soybean coffeetable book, "SOYAmazing Stories from the Field: Results from Soybean R&D Program"; conduct of the 2nd leg of the Luzon Soybean Cooking Contest; and awarding of the seven Intellectual Property certificates.

Technology Promotion and Market Linkage

Recognizing the importance of promoting generated technologies from R&D, BAR participated in various trade fairs and exhibits. Attendance to these events provided a venue to establish networks and meet new potential market partners.

MADRID FUSION MANILA
6-8 April 2017, SMX Convention Center
SM Mall of Asia Complex, Pasay City
(featured: Cacao wine)

30th ASEAN SUMMIT
26-29 April 2017, PICC, Pasay City
(featured: Adlay grains and Heirloom rice)

SIAL CANADA 2017
2-4 May 2017, Toronto, Canada
(featured: Tilapia ice cream)

TienDA FARMERS' & FISHERMEN'S OUTLET
28-30 July 2017, World Trade Center, Pasay City
(featured: Queen pineapple and Mushroom)

Major Activities

Technology Commercialization on Wheels (TCoW)

As demonstrated in the first roll-out, the second featured hands-on training on one technology per one farmers' association fro every selected municipality. Municipality was selected based on the potential for technology adaptation. In-depth discussions on financing and marketing were conducted to facilitate the start of a community-based agricultural enterprise.

SITES	TECHNOLOGIES
Lucban and Dolores, Quezon	carabao milk, and wild raspberry processing
Tiwi and Legaspi City, Albay	sweet potato processing
Calauag, Infanta and Tagkawayan, Quezon	seaweed, kapis, and oregano processing
Malilipot and Manito, Albay	coconut and abaca processing
San Narciso, Quezon and Manito, Albay	native swine meat processing
Tiaong, Mulanay, Tagkawayan, Quezon and Guinobatan, Albay	Indian mango, cacao, macapuno processing

Agriculture and Fisheries Technology Business Incubation (TBI) Seminar

BAR, in collaboration with the InangLupa Movement, Inc., conducted the "Agriculture and Fisheries Technology Business Incubation Seminar" as part of the initiative to streamline the TBI, a strategy to enhance the implementation of NTCP. It provides a network of support in terms of resources, services, and facilities to technology-based businesses. Among the invited speakers were Dr. Dileepkumar Guntuku, Global Program Leader of the Seed Science Center, Iowa State University, USA; and Dr. Kiran Kumar Sharma, CEO of the Agribusiness and Innovation Platform, ICRISAT, India.

Financial Viability Training for BAR-HVCDP Funded Projects

To equip research personnel of various national and regional academic and research institutions with knowledge and skills in conducting financial viability and profitability analysis of new technologies and enterprises, BAR, in collaboration with SEARCA, facilitated a financial viability training for BAR-HVCDP funded projects. There were 53 participants who joined in the activity wherein 30 commodities have been subjected to financial viability and profitability analysis.

First Batch: June 5-9, 2017

Second Batch: June 27-30, 2017

Technologies Generated/Commercialized

Project Title:	**Piloting of Arabica Coffee Rooted Cuttings as Plant Materials in the Highlands**
Implementing Agency:	Bureau of Plant Industry-Los Banos National Crops Research and Development Center
Beneficiaries:	Coffee farmers and growers
Project Site:	Guisad Valley, Baguio City
Technology Intervention:	Use of rooted cuttings as reproduction method against soil borne diseases and to increase growth

Project Title:	**Commercialization and Promotion of Processing Potato Varieties Through Rapid Multiplication Technique in Potato Growing Areas**
Implementing Agency:	Benguet State University
Beneficiaries:	Potato farmers and growers
Project Site:	La Trinidad, Benguet
Technology Intervention:	Use of tissue culture to mass produce and commercialize planting materials of NSIC-approved potato processing varieties

Project Title:	**Commercial Production of Soft, Semi, and Hard Cheeses from Goat, Buffalo and Cow's Milk**
Implementing Agency:	University of the Philippines Los Baños
Beneficiaries:	Dairy entrepreneurs and cooperatives
Project Site:	Los Baños, Laguna
Technology Interventions:	Use of locally-produce milk to process into soft, semi, and hard cheeses; improve label and design of packaging material for marketability; introduce cheese business enterprise model to dairy entrepreneurs and cooperatives

Project Title:	**Enhancement of Innovative Chevon-Based Products towards Commercialization**
Implementing Agency:	Central Luzon State University
Beneficiaries:	Small ruminant growers and entrepreneurs
Project Site:	College of Home Science and Industry, CLSU
Technology Interventions:	Use improved technologies from goat meat; develop processing protocols to scale-up processing of goat products; develop nutrient contents and enhance shelf life capacity

Success Stories

TECHNOLOGY COMMERCIALIZATION FOR CACAO IN THE PROVINCE OF QUEZON

To add premium value to cacao, the Quezon Agricultural Research and Experiment Station (QARES), under the DA-RFO 4A, developed wine products from different cacao varieties.

Beneficiaries were trained to process beans into tablea, soap, and wine. Cacao growers in San Antonio, Quezon, particularly the members of the Rural Improvement Club (RIC), adopted the technologies on the processing of beans and are now producing cacao wine and soap.

A small livelihood center was established for the beneficiary group where they can process and sell the products.

Another association, the Cacao Farmers' Association of Nagcarlan (CFAN) in Laguna, showed interest and started to produce and sell cacao products (soap, wine, and tablea).

Around 200 wine per month are now being processed and packaged at the livelihood center and at DA-QARES. Cacao wines and other cacao products are available at the livelihood centers in San Antonio, Quezon and at DA-QARES. A 375 ml bottle of wine is being sold at Php 250. This BAR-supported initiative of DA-QARES was featured during the Madrid Fusion Manila 2017 held on 6-8 April 2017 at the SMX Convention Center of SM Mall of Asia Complex in Pasay City, Manila.

PRODUCT DEVELOPMENT AND PROMOTION OF NIPA BY-PRODUCTS IN BICOL REGION

Likened to the popular Balsamic vinegar, but cheaper and affordable, Nipa palm salad dressing is now a common eye catcher at SM Naga, specifically at J-Emmanuel store. Developed by the DA-Regional Field Office 5-Bicol Integrated Agricultural Research Center (DA-RFO 5-BIARC), Nipa syrup-based salad dressing was developed as part of promoting and expanding the underutilized Nipa sap of the research center. The project aimed to promote the use of Nipa to provide livelihood opportunity, and increase and sustain productivity through additional knowledge, profitability, and income in women of Canaman, Camarines Sur. The group now regularly supplies 30 bottles each of 1L, 500mL, and 375mL of Nipa salad dressing sold at J-Emmanuel store at SM Naga. The group started supplying 120-150 bottles of 1L, 500mL, and 375mL of Nipa salad dressing at SM Savemore (Bicol) since 2016.

COMMERCIALIZING KAMIAS (*AVERRHOA BALIMBI* LINN) PRODUCTION AND UTILIZATION FOR THE WOMEN GROUP KUMARE OF REAL, QUEZON

Trials on propagation by seeds and using asexual propagation were conducted resulting to 5,000 seedlings produced of which 2,500 seedlings were distributed to members of the beneficiary group and other interested clients for the establishment of groves. Members of the Kilos Unlad ng Mamayan ng Real (KUMARE) group attended trainings on *kamias* production, field management, and product development spearheaded by DA-QARES. Existing products developed from *kamias* included soap, prunes, and candy. Trials were conducted to assess the oxalic acid content of the fruits to be used as bleach or anti-browning agent. *Kamias* soap and *sinigang* powder are now available in local market and KUMARE's business outlet in Real, Quezon. Market linkage was created for the two products. The group is looking into tapping the tourist industry of Quezon and arrangements are being made to supply products to beach resorts, hotels, and other establishments.

TECHNOLOGY ENHANCEMENT AND COMMERCIALIZATION OF THE TILAPIA ICE CREAM

Developed by the Central Luzon State University (CLSU), tilapia ice cream won during the Salon International de l'Agroalimentaire (SIAL) ASEAN Manila 2016 held at the World Trade Center, Manila. It received a gold medal as the "Innovation World Winner Awardee" which was participated in by 350 exhibitors from 25 countries. The DA-Agribusiness and Marketing Assistance Service (AMAS) chose tilapia ice cream to be showcased during the SIAL Asean Manila 2016. On 2-4 May 2017, the Tilapia Ice Cream made its way to the SIAL Canada in Toronto, which drew an interesting perception from the international community. BAR, under the NTCP, supported the technology enhancement and commercialization of tilapia ice cream along with the developed tilapia cookies optimally aligned to consumers' preference.

SWEET SORGHUM-BASED FORAGE CROP PRODUCTION SYSTEM FOR CATTLE FEEDLOT FATTENING

The project sought to demonstrate the feasibility of using sweet sorghum as the main feedstuff in cattle feedlot fattening system. Under this initiative, the performance of fresh and ensilaged sweet sorghum was compared with other feedstuff such as sugarcane and corn. Eight treatments were used to compare the growth performance and economic benefits of each formulation. The project provided small farmers in Negros with an opportunity to earn additional income through livestock farming. A field day was conducted at La Granja Research and Training Station in La Carlota City, Negros Occidental wherein 30 participants from the municipalities of La Castellana, La Carlota, Ponte Verde, San Enrique, and Kabankalan attended. Seminars were provided to them with topics on beef cattle feedlot fattening system, feed calculator, and forage production and silage making.

COMMERCIALIZATION AND PROMOTION OF PROCESSING POTATO VARIETIES THROUGH RAPID MULTIPLICATION TECHNIQUE IN POTATO GROWING AREAS

The project produced 7,000 tissue-cultured mother plants with which mass propagation was done in a greenhouse to produce 30,000 stem cuttings. These were distributed to farmer-beneficiaries from Atok, Madaymen, Buguias, and Mankayan in Benguet; and in Bauko and Besao in Mountain Province. Dinah Cunning, an adopter of the technology, was able to produce 1,635 kilograms of G1 potato (harvested from minitubers). These potatoes were used as source of planting materials for the next generation (G2) for other areas in Soquib, Besao. Meanwhile, Robert Pakipac, another farmer-adopter from Pactil, Bauko, Mt. Province shared that prior to the introduction of the technology, they could only harvest five tons from their one-hectare farm lot. With the use of clean planting materials distributed by Benguet State University, they can now harvest 10 tons or more. Both adopters have committed to share the planting materials with their fellow potato growers.

RIMAS BIODIVERSITY RESEARCH, CONSERVATION, AND PROPAGATION IN THE BICOL REGION

Rimas ice cream was first showcased and presented by BAR to the public in 2013 during the conduct of its Agriculture and Fisheries Technology Forum and Product Exhibition at SM Megamall, Mandaluyong. Rimas ice cream won as one of the innovative products for that year owing to its novelty, uniqueness, and market potential. In October 2017, rimas ice cream was officially launched in Siruma, Camarines Sur. Putting a twist on the conventional flavors of ice cream, this new delicious dessert has become a delight even to those who have picky taste buds. Rimas ice cream comes in three variants: rimas with sweet potato, with cheese and chocolate, and with langka.

National Commodity Programs

In responding to the needs of the agriculture and fisheries sector, R&D initiatives must be attuned to the major challenges of the time. A unified effort is important in achieving a level wherein the potential economic gains are within reach and the impact are evenly felt at the grassroots level, the farming and fishing communities.

Over the years, BAR aims to go the extra mile in being a dynamic and responsive agency wherein R&D is resolved to not only being compliant to the tasks given, but can deliver effective results leading to work in action. It should support research programs that truly respond to the need of the times.

This section highlights the accomplishments of BAR particularly on the R&D aspects of the various national commodity programs as prioritized by the Department of Agriculture.

RICE

The National Rice Program is one of the banner commodity programs of DA that focuses on rice as a food staple and an economic commodity. The program also looks into uplifting the lives of Filipino farmers through improved rice farming. The program integrates government initiatives and interventions for the agriculture sector and plays a key role in DA's Food Staples Sufficiency Program (FSSP).

To carry out these objectives, interventions were undertaken from the national to the local levels in the form of support to rice production; irrigation; postharvest and other infrastructure facilities; market development services; extension, education and training services; and research and development.

In 2017, under the BAR's Rice R&D Program, 189 projects were funded and coordinated, of which, 111 are completed and 78 are on-going.

Among the completed projects included: 1) Rice Varieties for Rainfed Lowland Drought Prone Environments; 2) GIS-based Water Resources Assessment for Smallscale Irrigation Projects (SSIP) Suitability in Regions 4A, 4B, 6, 7, 8, 10, 13; and 3) Pest and Disease Risk Identification and Management (PRIME).

BAR also conducted major activities in support to the strategic rice RDE both on national and regional scopes. These activities included: 1) Consultative Workshop on the Assessment of Rice and Rice-based Research and Development/ Extension Capacities in Region 7; 2) Consultative Workshop on the Assessment of Rice and Rice-based R&D/E Capacities in Luzon Cluster; 3) First Meeting of the Sub-Technical Working Group for Policy and Regulations for the National Rice Roadmap; and 4) Year-End Review of "Collection of Farmers' Rice Lines in Irrigated and Rainfed Lowland Areas in the Philippines".

Raising Productivity and Enriching the Legacy of Heirloom Rice through Empowering Communities in Unfavorable Rice-Based Ecosystems (or **Heirloom Rice Project**)

Component 1 of the Heirloom Project resulted to 80 varieties from CAR (55) and North Cotabato (25) that were characterized focusing on their grain and nutritional qualities. For Component 2, both the groups of the International Rice Research Institute and the Philippine Rice Research Institute capacitated farmer-leaders and other stakeholders through the conduct of training and farmers' field school, respectively. For Component 3, the formation of the self-help groups (SHGs) into provincial cooperatives were CDA-registered. Also, four varieties Code of Practice (COPs) were drafted incorporating various aspects of research results or outputs that are now used as science based information that can guide good agricultural practices and appropriate production of heirloom rice: *Ominio* for Mountain Province, *Lasbakan* for Benguet, *Chong-Ak* for Kalinga, and *Tinawon* white (Innawi) for Ifugao. The application of a Collective Mark for Cordillera Heirloom Rice Philippines at DTI-CAR IPOPhil for each for the three provincial cooperatives was also successfully completed.

Accelerating the Development and Dissemination of Associated Rice Production Technologies that are Resource-Use Efficient

Among the accomplishment of the project were: 1) addressed issues on climate change, water scarcity, and energy cost point to the need to accelerate the development and dissemination of associated production technologies that are resource-use efficient; 2) increased 14 percent in an average on the grain yields of rice with Alternate Wetting adn Drying (AWD) + AssocTech relative to farmers' practice across all sites; 3) resulted to higher net profit by an average of 40 percent with the use of associated technologies; 4) increased area irrigated by 39 percent in farms located at the tail-end (Liwanag IA) after upstream farms (Balufia IA) adopted AWD in Isabel; 5) increased water productivity by 17 percent using AWD compared to baseline data for the Philippines ranging from 0.2 to 1.2 kg grain per m3 water relative to continuous flooding.

CORN & CASSAVA

Corn and cassava are considered important crops in Philippine agriculture. Corn is the country's second most important staple and is used as feed ingredients for livestock and poultry industry. Cassava, on the other hand, is regarded as one of the cheapest sources among the major starch-based feedstock.

To maintain the growth momentum of corn and enhance cassava production technologies in the country, the National Corn-Cassava Program, through BAR, extends fund support for institutional researches and development on integrated soil management, cost-reducing production, postharvest and processing technologies by other government institutions, DA regional offices, and agricultural state universities and colleges.

In support to the program, BAR is continuously coordinating 209 corn and cassava projects, of which 113 are completed and 96 are on-going.

In 2017, three new R&D projects under the program were prioritized. These were: 1) "Survey and Early Warning on Cassava Arthropod Pests and Diseases in the Philippines" that aims to establish and strengthen regional monitoring, surveillance and management system of cassava pests and diseases; 2) "Development of Zinc Solubilizing Inoculant for Improved Crop Nutrient" that focuses on determining in-vitro zinc solubilization capabilities of the acquired isolates derived from composite and rhizospheric soils of diverse rainfed agro-ecosystems from existing culture collections in Philippine National Collections of Microorganisms in the Philippines (PNCM); and 3) "Development and Field Testing of Greenhouse Solar Dryer for Food and Safe Cassava Products" for fabrication and optimization of the greenhouse dryer prototypes for cassava processing.

Corn Germplasm Utilization through Advanced Research and Development (CGUARD)

CGUARD is a program led by the DA National Corn Program, in collaboration with BAR and DA regional field offices and other corn stakeholders, to conserve the existing native and traditional varieties, develop the breeding materials using native germplasm, and determine the genes responsible for different unique traits in native varieties in increasing corn grain yield and improving the corn productivity in the country.

Initiated in 2015, the program aimed to collect, conserve, and develop native corn germplasm for agronomic response to different environment and physiological stresses including pests and diseases, soil acidity and salinity, soil fertility, drought, and water logging.

As of 2017, CGUARD germplasm collection is consisted of 2,403 native maize populations nationwide. From this collection, 43 CGUARD native maize populations were found to be resistant/ tolerant to the biotic and abiotic stresses.

Below shows the summary of promising populations of native maize in the country:

Stresses	No. of populations distributed for screening	No. of promising populations with degree of tolerance/resistance
BIOTIC STRESS		
Downy mildew	108	5
Bacterial stalk rot	104	2
Fusarium ear rot	127	1
Corn weevil	151	5
ABIOTIC STRESS		
Drought	162	10
Waterlogging	124	6
Calcareous soil	167	10

CORN & CASSAVA

One of the biggest challenges to cassava production is the occurrence of pests and diseases. There are a number of pests and diseases attacking cassava, but at the moment, Cassava Phytoplasma Disease (CPD) is considered as the most challenging and rigorous one. When the plant is infected, in many cases there are no symptoms at all. It depends on the variety, season, age, elevation, temperature, soil nutrition, management, and interplay of other factors.

With CPD, if the manifestations or the symptoms appear as early as 2-3 months, there is 100 percent loss as there will be no more production of roots. If the symptoms appear at the later stages like 5-6 months or onward, reduction in yield of up to 40 percent is expected.

Corn and Cassava R&D Projects with Significant Findings

Nationwide Survey and Early Warning on Cassava Arthropod Pests and Diseases in the Philippines

The incidence of CPD has been reduced because DA-RFOs used the *Streptomycin Sulfate* as pre-planting treatment. The Fertilizer and Pesticide Authority (FPA) accredited Verca Corporation to be the national distributor of Streptomycin in the country. To manage the other major pests and diseases, applied research projects have been proposed and approved to 16 DA-RFOs cassava areas to strengthen monitoring and surveillance of cassava pests and diseases.

Implemented by the DA regional field offices, the project has the following initial findings/results:

- There are 543 farms that were tagged in the 16 DA-RFOs cassava areas. These observation areas are now being used as monitoring sites.
- Based on the data gathered, the first three most common pests and diseases observed were: red spider mites, cassava brown leaf spot, and whiteflies.
- Infection of CPD is most severe in Region 3 followed by Regions 10 and 7.
- In the region where CPD was most severe, it was observed that the farmers are also practicing monocropping system;
- The inclusion of weather data will add more sense to the analysis. It may help the farmers as well as the policymakers to craft the necessary action plan to boost the cassava industry.

HIGH VALUE CROPS

The High Value Crops Development Program (HVCDP) is one of DA's banner programs created to help address food security, poverty alleviation, and sustainable growth. It promotes production, processing, marketing, and distribution of high-value crops.

In line with the mandate of BAR to monitor, evaluate, integrate, and manage agricultural research activities, a series of national reviews and strategic planning workshops for BAR-funded R&D projects under HVCDP commercial crops in fruits, plantation crops, vegetable and root crops were conducted. The activities aimed to bring strategic courses of actions to further enhance and improve project implementation towards the attainment of the program's goals in line with the sectoral plan of the DA.

BAR and HVCDP have also collaborated on several R&D projects. It supported 91 projects of which 45 projects are new and 46 are on-going. These projects are categorized into applied and commercialized R&D. The commodity projects included coffee, cacao, garlic, onion, mango, pineapple, indigenous vegetables and fruits, yam, legumes, ginger, adlay, and soybean.

The projects funded under the HVCDP program are as follow:

Category	Physical
Applied Researches	
New	19
Continuing	22
Commercialized R&D	
New	26
Continuing	24
Total	**91**

GARLIC

Initial Plans for Garlic R&D

On 17 August 2017, a meeting was facilitated by BAR for the initial plans for garlic R&D. This activity was attended by representatives from UPLB, MMSU, BPI, and DA-RFO 1. The meeting was done in support to the Secretary's instructions to increase sufficiency in garlic production to 55 percent from the current seven percent of national demand. A proposed R&D program was developed titled, "Varietal Evaluation of Garlic in Selected Regions" which aimed to identify expansion areas for garlic production and to develop package of technology for each identified area using traditional garlic varieties that will later integrate tissue-cultured improved garlic cultivar.

Briefing on the Technologies Generated by BAR on Priority High-Value Crops

On 22 September 2017, a briefing on the technologies developed from BAR-funded projects on garlic and onion, was held at 2nd Floor, DA New Building. It was attended by DA Undersecretary for High-Value Crops and Rural Credit Evelyn G. Laviña and was joined by identified project proponents including BAR focal persons for garlic.

Newly BAR-funded Garlic Tissue Culture Laboratory

To increase the volume of producing clean garlic planting materials through tissue culture, a project titled, "Upgrading IPB's Tissue Culture Facility for Sustained Production of Disease-Free Planting Materials of Garlic" was approved in September 2017.

Project on Utilization of the Technology of Producing True to Type and Certified Virus-free Garlic for Economic Production of Planting Materials for the Farmers

Through the project, 18 accessions that are currently being micro-propagated were subjected to virus-indexing and karyotyping. It established an optimization of media used in garlic tissue culture resulting to a high-yield performance of tissue cultured garlic under field condition at about 65 percent yield increase starting from the second generation. A dot immuno-binding assay protocols for virus-free certification in garlic and optimized protocol for DNA extraction of garlic and tested SSR markers for varietal identification was also crafted.

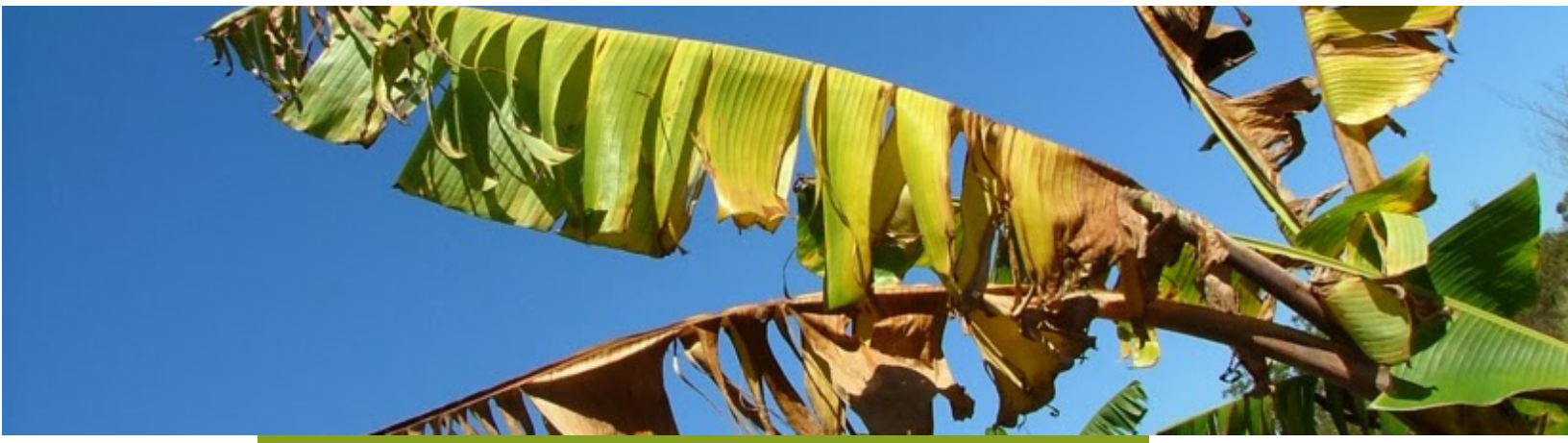
MANGO

Completion of Development of Pest Control Strategy against Cecid Fly in Mango Project

Cecid fly infestation did not seem to be affected by any cultural management practices. Study cited that pruning practices and maintaining the undergrowth under control have high cecid fly infestation as well. The chemical control studies against cecid fly showed variable effects. It was found that even soil drenching of *Thiamethoxam* (a broad-spectrum, systemic insecticide that is easily absorbed by plants and transported to all of its parts), was not effective in controlling cecid fly. However, results were seemed to be an artifact.

On the insecticides sprays evaluated, *Carbaryl* (a chemical in the carbamate family used chiefly as an insecticide) showed promise in reducing cecid fly damage. No parasitoid was observed/segregated from the cecid fly extracted from fruits, but, a number of cecid fly larvae extracted from the shoots were parasitized. There was also a probability that these parasitoids could as well attack cecid fly from fruits. It was only when there were mango fruits that cecid fly can be observed. Population of cecid fly was low at the start of the season and started to shoot up in the middle of the season and fall off as the season ended.

The life history study showed that cecid fly could inflict severe damage in mango due to its short life cycle enabling it to complete several generations during fruit development stage. Since pupation was observed in the soil, the pupa seemed to be the most vulnerable stage of the insect and thus, control strategies must be done. The comparative morphological study showed that cecid fly attacking the fruits were distinctly different from those in the leaves and that the species in fruits were *P. frugivora* and those in the leaves were *P. pustulata*. This implied that they should be treated separately in the application of control. Galling leaves should be sprayed only if there is severe infestation to conserve the natural enemy, *P. pustulata*.



BANANA

Completion of the Project on Banana Fusarium Wilt Mitigation

The Bioversity International, with funding support from BAR, embarked on banana projects to provide Cavendish growers an immediate solution to Fusarium wilt that was threatening to wipe out banana plantations. Through the projects, the GCTCV 219 was introduced.

GCTCV-219 is a banana variety that is resistant to the latest strain Tropical Race 4 currently found in Asia, Oceania and Africa. This variety is a potential alternative for the commercial Cavendish variety,which is a widely-grown group of bananas for international trade and domestic use, but susceptible to the destructive banana disease.

Through the project, 21 farmer-cooperators in Davao City, Davao del Norte, Davao del Sur, and Compostela Valley, whose farms were totally destroyed by the disease, benefitted from this research initiative. Banana farmer-growers were given more than 30,000 seedlings for piloting in their farms.

Although the bunches of GCTCV variety are slightly smaller than the popular Cavendish cultivars and the plants take longer to bear fruit, research result showed that it is a sweeter banana and has been well received by farmers.

With the optimization of the harvesting time and ripening protocol, and improvements in packaging and branding, the new banana variety has now been successfully exported to Japan offering more income opportunities for the Filipino farmers.

VEGETABLES & LEGUMES

Completion of the Project on Survey of Pathogens in Vegetables of Significance to Food Safety in Luzon, Philippines

Microbial contamination in fresh produce (*Escherichia coli, Salmonella spp*., somatic phages/viruses) was identified using the culture and molecular methods. A food safety protocol in Luzon based on the significant findings gathered from the project was developed.

Completion of the Project on Enhancing the Effectiveness of Crude Preparation of Botanical Pesticides against Selected Insect Pests and Plant Pathogens of Selected High-Value Vegetables

Technologies on botanical insecticide for effective management of insect pests and diseases of high-value vegetables were developed. This was obtained through screen activity of botanical pesticides against insect pests and pathogens associated with high-value vegetables in the laboratory and greenhouse and by formulating crude preparations verifying their effectiveness in selected vegetables and organic field.

Completion of the Project on Groundwork for Groundnut: Improving Productivity and Sustainability of Peanut Production in CALABARZON

Information on peanut production and household profile of peanut growers were identified. Integration of peanut production technologies and establishment of seed multiplication systems were also developed.

Completion of the Project on Sustainable Seed and Technology Transfer Support Systems on Food Legumes in Region 2

Through the project, 2,000 kg of mungbean were produced for 1,000 hectares expansion areas in Region 2; and 20,000 kg mungbean seeds for distribution to other regions (1, 3, 4, 6, 7, 9, 10, and CAR). Region 2 also produced 5,000 kg peanut seeds for their expansion areas and 10,000 kg for other regions. Likewise, existing legumes seed grower's organization were capacitated, seed storage was provided, and promotion and adoption of bio-seed inoculant technology was supported.

ADLAY

Adlay is an indigenous crop that belongs to the family *Poaceae*, or the grasses, the same family to which rice and corn belong. Since the inclusion of the crop in the BAR's R&D programs, several research initiatives had already been undertaken to promote and explore the potential of the crop.

On 25-29 September 2017, BAR, in collaboration with DA-RFO 10, the "2nd National Adlay Congress and Farmers' Field Day" was conducted in Dalwangan, Malaybalay City. With the theme, "Bringing Technologies of Adlay and other Agri-Commodities to Farmers and Stakeholders through Intensive Technology Transfer and Commercialization for Food Secure and Self-Reliant Communities," the event aimed to demonstrate research technologies that were studied, practically used, and applied at the farmers' field. Nearly a thousand individuals, comprising of researchers, scientists, academicians, members from the national and local government units, private sector entities, students, and farmers attended the activity.

As of 2017, BAR has been coordinating 54 R&D adlay projects, of which 45 are completed and 9 are on-going.

From the 54 adlay projects, 14 projects are being implemented by state universities and colleges and PhilMech while the remaining 40 are implemented by DA-RFOs.

Highlights of Accomplishments by Commodity

As of 2017, the areas for the expansion of adlay seed production in the country increased, particularly in the following regions:

Region	Adlay Seed Production
DA- RFO 2	The Cagayan Valley Research Center is in need of big volume of adlay grits to supply the increasing demand of Gourmix. Activities undertaken were: • Expansion areas for seed production in other provinces like Quirino and Nueva Vizcaya; and • As of 2017, sales totaled to Php 2,8210,975.00 from selling Gourmix, adlay grits, and polvoron.
DA- RFO 10	Hineleban Foundation, an NGO based in Manolo Fortich, Bukidnon is now an active advocate of adlay as a healthy food. It has the following accomplishments: • Adlay seed production area of about 10 hectares with plans to expand up to 148 hectares in 2018; and • Sales of Php 1,858,000.00 from selling adlay grits (catered to the "A Class" consumers including high class hotels/restaurant in Manila, corporate offices/well-known chef and specialty stores. They created Hineleban Adlay Online wherein the public can directly order the Adlay grits.

DA-RFO 2 Adlay Seed Inventory (January- December 2017)	
Total production area:	198 hectares
Total harvest:	72,225 kg
Utilized for promotion/distributed:	25,142 kg
Total available seeds for distribution:	47,083 kg
May 2017	24,566kg
Dec 2017	22,517kg
No. of farmers served	2,760
Target area and production for 2018	
Total production area:	**294.25 hectares**
Total production (kg):	**248,794 kg**
Note: The highest 2018 adlay seed production target comes from Hineleban Foundation with target of 148, 000 kg followed by Region 10 with target of 70,000kg of adlay.	

HERBS AND SPICES

Enhancing Stevia Production through the Use of Tissue-Cultured Planting Materials and Improved Farming Techniques, UPLB

This project was able to optimize tissue culture protocol and conventional method for producing Stevia (*Stevia rebaudiana*) planting materials. Benchmark information on *Steviol glycoside* (chemical compounds responsible for the sweet taste of the leaves) production in Stevia plant as affected by photoperiod, nitrogen fertilization, and GA3 spray were also generated.

The tissue culture (tc) protocol developed was simple and cost-effective , the cost of mass producing of planting materials (tc) in a short period, using cheap culture medium is Php15 versus Php35 (stem cuttings) per plant. There are information that may be used as bases for developing cultural practices and processing techniques.

LIVESTOCK & POULTRY

To ensure the conservation and utilization of domesticated native animals, DA launched the Philippine Native Animal Development (PNAD) program, led by the Bureau of Animal Industry (BAI).

BAR has been supporting related R&D projects geared towards the promotion and development of native chickens and native pigs by providing fund support to the implementation of R&D projects.

In 2017, BAR coordinated and funded 25 livestock and poultry-related projects, of which 4 are new and 21 are on-going. Projects were on production, promotion, market exploration and commercialization of native pigs and development of breeder farms for native chicken for meat and egg production. These projects were implemented in partnership with other government institutions and agricultural state universities and colleges.

Several meetings were conducted to discuss accomplishments and plans and to address issues on native animal industry. BAR participated in PNAD Technical Working Group (TWG) and Regional Focal Person Meeting and Workshop on 20-23 March 2017 to discuss the provisional agenda on: native animal breeder farm accreditation, development of national ID system for native animals, regional native animal inventory from institutional and privately-owned farms, breeding system for the purification, conservation, workshop on appropriate breeding system strategies for priority commodity per region and listed significant activities and targets for 2017.

School and Community Level Commercialization for Boholano Strain of Philippine Native Chicken

The project spurred multi-dimensional economic activities that increased the income of cooperators and Rural Improvement Club (RIC) in the area. It influenced the growth of the food service industry resulting to increase income and strong purchasing power of the cooperators, RIC, and other stakeholders in the industry. As income increased, social benefits specifically better education, good health and nutrition for the whole family were also improved.

Supply Value Chain Analysis of Native Chicken in Batangas and Quezon

The potential impacts of the project were: 1) increased number of growers engaged in/shifting to the production of native chicken; 2) increased volume of native chicken in the market; 3) increased number of consumers purchasing/ shifting consumption to native chicken; 4) increased adoption of technologies and higher productivity and technical efficiency in native chicken production; 5) improved efficiency in native chicken marketing and value-adding activities; 6) better marketing decisions because of access to market information; 7) improved logistical support provided by the direct and indirect participants in the supply value chain of native chicken; and 8) increased income of the various stakeholders in the supply value chain of native chicken.

Commercialization of Philippine Native Cattle for Optimum Production of Siquijor Beef

The project resulted to the positioning of Siquijor beef as prime quality meat. Also, through the interventions introduced, grading standards, meat cuts, and meat products and by-products were developed specifically for native beef.

National Thematic Programs

Aside from the commodity programs, BAR also prioritizes thematic programs of national scope that can impact both the production and profitability of the agriculture and fisheries sector.

Given that R&D plays a significant role in bringing about increased productivity, BAR further strengthened its role by supporting thematic programs and projects that can directly affect food production and generate increased in income both for the farming and fishing communities.

Organic Agriculture

Over the years, the recognition and appreciation on organic farming has gained more attention among practitioners and other stakeholders.

Under the Organic Agriculture (OA) Act of 2010, BAR is mandated to coordinate, develop, enhance, support and consolidate activities-related technologies for the formulation and implementation of a unified and integrated organic agriculture RDE plans and programs. The Act intends to reduce pollution and destruction of the environment, prevent the depletion of natural resources, protect the health of farmers, consumers, and the general public, and save on imported farm inputs.

In compliance with the Act, BAR included OA as one of its thematic programs by funding and supporting the implementation of several OA and OA-related projects in the country.

In 2015, the Organic Agriculture Research Development and Extension Agenda Programs (OA RDEAP) 2018-2023 was crafted. It is a medium-term R&D development plan that caters to the needs of the agriculture and fisheries sector. It is focused on the value chain approach with corresponding researchable areas, and expected outputs based on the needs of the industry. The OA RDEAP serves as a reference material for R&D implementing partners in the conduct of research on organic agriculture.

As of 2017, BAR funded and supported 29 RDE projects composed of 19 applied researches, 8 production and post-production related technologies for commercialization, and 2 on the establishment of OA R&D facilities.

One of the major accomplishments of BAR in 2017 was the publication of the "Compendium of BAR-Funded Projects under National Organic Agriculture Program 2011-2016." This was launched during the 14th National Organic Agriculture Congress held on 24-26 October 2017 in Cagayan de Oro City.

Six technologies were developed from the applied research projects that were completed in 2017. These include:

1. Development of Package of Chemical Free Production Technologies using Animal Manures with Biofertilizer cum Biopesticide Properties for Tomato and Garlic (MMSU)

2. Validation and Documentation of Organic Production System for Lowland Rice and Eggplant-Mungbean in Pangasinan (DA-ILIARC)

3. Validation and Documentation of Organic Production System for Lowland Rice and Mungbean-Okra in Tarlac (DA-CLIARC)

4. Validation and Documentation of Organic Production Systems for Rice and Bittergourd-Squash in Zamboanga Sibugay (DA-ZAMPIARC)

5. Validation and Documentation of Organic Production System for Lowland Rice and Squash in Buenavista, Agusan Norte (DA-CARIARC)

6. Organic Okra Production Pest Management Technologies Development for Local and Export Markets (TAU)

In addition, three technologies were commercialized from the following technology commercialization projects:

1. Integrated RDE Program on Commercial Production of Free-Range Chicken among Women in Santa Ignacia, Tarlac (TAU)

2. Promotion of Organic Farming Technologies for High Value Vegetables and Native Pigs Production in Kalayaan, Laguna (CELPA, Inc.)

3. Expansion of Native Pig Production and Commercialization of Developed Processing Technologies in Tagkawayan, Quezon (SLSU-JGE)

Biotechnology

Biotechnology is an imperative tool that can be utilized by the agriculture and fisheries sector to increase food production. The innovativeness of today's modern times coupled with food production-related technologies are added opportunities in addressing the global food requirement. Since biotechnology is centered on an informed decision through accurate and science-based information, there is a need to complement initiatives among industry players.

BAR has been supportive of DA's Biotechnology R&D Program by coordinating and supporting high-impact biotechnology R&D. The R&D Biotech Program aimed to facilitate the agriculture sector's move from a resource-based to a technology-based industry by developingand applying a wide-range of biotechnology techniques and tools while ensuring biosafety.

In 2017, the dissemination of informative and valuable information was intensified through the Applied Biotech Research (ABR), Information, Education and Communication (IEC), and Institutional Capacity Enhancement (ICE), which were being coordinated and funded by BAR and DA-Biotechnology Program Office. There were 44 projects funded, of which 11 are new.

These projects are being coordinated together with various DA and non-DA institutions. Specifically, the projects focused on the development of diagnostic platform for forecasting crop diseases, validation of molecular based detection protocol for *Salmonella* in meat, molecular characterization of witches' broom cassava disease, molecular marker diagnostic kit for durian, and field evaluation of microbial inoculants for micronutrient mobilization. Further, through the DA-Biotech Scholarship Undergraduate Program, BAR supported the continuing education of 56 scholars.

In 2017, the program was able to produce technologies that will benefit the various sector.

In the area of crop production, technologies on tissue culture protocol for abaca hybrids, potential drought-tolerant eggplant breeding lines, and improved Papaya Ringspot virus resistant Papaya F1 hybrids were generated.

In the field of crop protection, technologies generated included polymerase chain reaction (PCR)-based method for early detection of *M. fijiensis*, the causal agent of black Sigatoka in banana and understanding of the genetic structure of the pathogen population in the Philippines, and serological and molecular-based methods for the diagnostics of major and emerging abaca virus diseases will safeguard the banana and abaca industry through effective and precise disease detection procedures.

In the area of soil fertility and crop nutrition, the technology Bacillus megaterium-based microbial inoculant (BioMeg) with longer viability was developed to be used specifically for sweet potato and yam.

For the fish industry, fish protein hydrolysates from yellowfin tuna (*Thunnus albacares*) viscera, that is high in protein and low in salt and fat contents, was developed.

The biotechnology program also focused on the nutritional aspects of agricultural commodity wherein technologies developed included probiotic anti-diarrheal herb in capsule form, probiotic guava leaf tea, probiotic guava-soya drink, local isolates of lactic acid bacteria, and baseline information on Batuan (*Garcinia binucao*) seed being seen as a good source of protein, amino acid, and oil for food and industrial application.

Climate Change

The Climate Change R&D Program of BAR covers specific measures that address the changing global weather phenomena, also known as climate change. The R&D program is in support to Republic Act 9729, also known as the Climate Change Act of 2009. The Act mandates the mainstreaming of climate change in policy formulation of programs and projects, plans and strategies, and policies, creation of Climate Change Commission, and establishing Framework Strategy and Program for climate change.

Since 2011, BAR has undertaken several measures in understanding this unforeseen threat of nature and has provided both short and long term solutions through R&D initiatives.

One of the most significant of which was the publication of the Climate Change Research, Development and Extension Agenda and Program (CC RDEAP) for Agriculture and Fisheries 2016-2022. Further to this, was the mainstreaming of climate change in DA programs, plans and budget as reflected in BAR's Climate Change R&D Program. Through this, Adaptation and Mitigation Initiative in Agriculture (AMIA) program has been initiated to be led by the DA-Systems Wide Climate Change Office (SWCCO).

In 2017, the program fund was lodged to the Climate Change of Program of BAR to be utilized for funding of R&D activities that were aligned with the AMIA framework with emphasis on increasing the adaptive capacity and productivity potentials of agriculture and fisheries livelihood.

In mainstreaming climate change in agriculture, 72 project were funded since 2011.

National Review and Planning Workshop of BAR-funded Climate Change Projects

April 3-6, 2017

For 2017, 12 projects were funded, while 15 are still on-going. These projects cater to both short-term adaptation and long-term adaptation projects, and in addressing a climate change mitigation strategy.

Another significant accomplishment for 2017 was the holding of the "National Review and Calibration of the DA-BAR's Climate Change (CC) R&D Program" on 4-8 September 2017 at PCC, Munoz, Nueva Ecija. The review, which is a multi-stakeholder consultative workshop in nature, resulted to the identification and prioritization climate change researchable areas for each subsector. For crops, 31; for poultry and livestock, 25; for capture fisheries, 12; for aquaculture, 28; and for cross-cutting concerns, 13.

Research gaps per sector were also presented to DA officials and industry representatives to primarily serve as a guide for BAR on the specific R&D activities that will be supported for the rest of the medium term.

Research Grants and Support Services

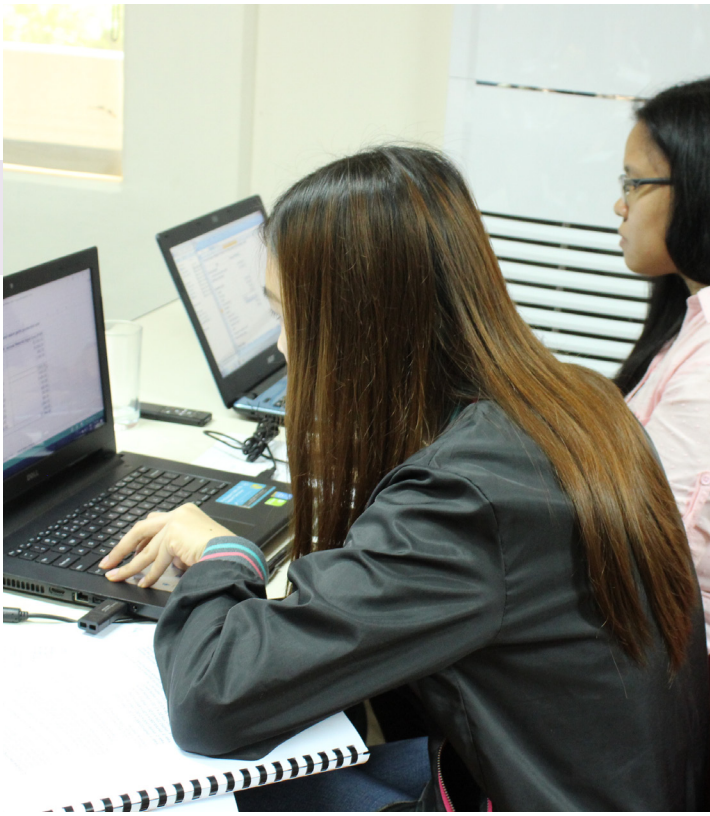
Aside from funding and supporting research initiatives that will produce significant technologies with the hope of improving the production and increase the income of the farming and fishing sector, part of the continuing effort of BAR as the national coordinating body for R&D, is funding initiatives in support to basic and strategic research and policy and advocacy researches.

Also, the implementation of R&D programs and projects will not be possible without investing in its human resource, research facilities, information and communication technology, and knowledge management.

Support to Basic and Strategic Research

BAR focuses on supporting basic and strategic R&D to enhance the generation of appropriate technologies. This is critical to the advancement of scientific information. Technologies generated from on-station and on-farm trials in midstream and downstream researches are further verified and validated by the community given its direct impact on the lives of the farmers and fisherfolk.

In 2017, BAR, through its In House Screening and Review Committee and the External Pool of Technical Experts, facilitated the screening and review of proposals. A total of 24 applied research projects (12 new; 12 continuing) or 80 percent of the physical target for 2017 were funded. Fisheries and aquaculture research and crosscutting research both have 7 new and on-going projects which totalled to 14. The rest of the projects were distributed under crops-related research (6 projects) and livestock and poultry (4 projects).



Policy Research and Advocacy

This is a continuing activity of BAR that involves coordinating with its national and regional partners to undertake policy-related studies and come up with assessment reports and recommendations on various agriculture and fishery programs and activities for the use of DA. In an ever-changing agri-fishery landscape, BAR holds its place as the DA's partner in the development of its programs.

BAR supported the conduct of impact assessment, market related and socio-economic research projects. The results of these studies contributed to public expenditure prioritization for R&D in agriculture and fisheries.

Completed

An Assessment of Sustainability of CPAR Projects at the Local Government

Implemented by the University of the Philippines Public Administration and Extension Services Foundation (UPPAF), the study looked into the sustainability aspect and mechanisms of several CPAR projects across Luzon, Visayas, and Mindanao, with and through the support and assistance of LGUs. The study assessed 10 CPAR projects and examined the projects' sustainability enablers and barriers. It was identified that a project's sustainability was enabled by: 1) Leadership – support, prioritization and commitment of the local chief executive, project proponents and focal persons; 2) Organizational Sponsorship – inter-agency cooperation for provision of personnel support, technical expertise, infrastructure and other support facilities; 3) Political and Economic Environment – Sanggunian's support; good road networks and other infrastructural requirements for effective transfer of technology; and 5) Other factors – good and transparent record keeping; incorporating indigenous practices into the project design; and disaster risk management for mitigating the negative impact of climate change. As such, barriers to project sustainability are basically the opposite of the enablers, apart from the absence of sustainability plans.

Collaborative Research, Development and Extension Services for Food Security in Regions 4A, 4B and 5

Implemented by UPLB in collaboration with DA-RFOs, SUCs, and LGUs in CALABARZON, MIMAROPA, and Bicol Region, the project focused on three key result areas: 1) seed system improvement, 2) extension system strengthening, and 3) improved provincial rice action planning. To improve the seed system, trainings, and consultations on soil testing, vermicomposting, dealing with pest infestation, and community seed banking were conducted. Also, technical demonstrations on registered and certified seeds were also carried out in low-yielding areas coupled with trainings for seed growers on entrepreneurship. To strengthen the extension system, round table discussions were carried out along with partners from SUCs. The project also released a policy brief titled, "Strengthening Agricultural Extension Function of State Universities and Colleges" which was submitted to the Commission on Higher Education (CHED) and the Department of Budget and Management (DBM) in the hope that they will create more items in the Research and Extension Division of SUCs. To strengthen the agricultural planning capacity of LGUs, planning workshops to come up with science-based rice action plan were conducted in the 16 provinces of Regions 4A, 4B, and 5 which were participated in by SUC and LGU personnel. This resulted to the creation of a process flowchart identifying the various phases and activities to be undertaken by the governance, institutional development, and partnership components of the project. Further, a research proposal per province was drafted.

On-Going

Linking Farmers to the Market: Towards Transforming Subsistence Farms to Commercial

This project is in its final stages of completion by the first quarter of 2018. Implemented by SEARCA, the study seeks to close the gap between farmers and consumers. It looks into the best practices on farm-market linkage and come up with policy recommendations to further strengthen the farm-to-table channels in both the public and private sectors. The proponents look into detail the: typology of rice, white corn and coconut farmers in selected areas, how these farmers link with the market/sell their produce, the constraints and disparity in the farm-market link, identify the best practices for farm-market linkages (based on the selected sites), and finally, come up with policy recommendations to bridge the void between farmers and the market and how to replicate the identified best practices, thus, transforming subsistence farming to one that is commercial in scale, turning farmers into agricultural entrepreneurs.

New Projects

Monitoring and Dietary Risk Assessment of Pesticide Residue in Beverages and Honey for ASEAN Maximum Residue Limits Setting

Implemented by UPLB, the project predicts dietary intake of pesticide residues for long term hazard in a refined estimate using the pesticide residue level detected and based on actual consumption of beverages. The evaluation of the dietary risk of pesticide residues in commercially-available fruit and vegetable juices, soybean milk, and honey through monitoring will lead to possible recommendations and establishment of maximum residue level (MRL) by the Fertilizer and Pesticide Authority (FPA) standards for ASEAN MRL setting.

Red Mold Rice as Natural Dietary Supplement: Market Studies

This research aims to assess the market awareness and acceptability of red mold rice as dietary supplement in the pharmaceutical, nutraceutical, and functional product industry. This will provide information to improve the product's acceptability and minimize the risk of market failure.

Human Research Development

BAR takes part in enhancing the capabilities of the manpower responsible in mobilizing the sector. Throughout NaRDSAF's network of R&D institutions, BAR's Human Resource Development Program (HRDP) offers financial assistance to students, employees, and researchers qualified for pursuing studies either in undergraduate, graduate, or post-graduate degree courses.

In 2017, BAR exceeded its target-beneficiaries for its undergraduate scholarships, granting financial support to 12 students from UPLB in their pursuit for degrees in Agriculture, Agri-Biotechnology, and Development Communication. Also, 13 undergraduate scholars graduated from UPLB, three of which finished with honors.

Recipients of the degree scholarships are open to DA staff or from any NaRDSAF-member institutions who are pursuing MS or PhD degree. In 2017, BAR was able to support five scholars under this grant.

Meanwhile, BAR's non-degree assistance program provides funding support for the attendance or participation of NaRDSAF-member institutions in agriculture-related R&D trainings, conferences, symposia, and seminars. BAR also extends its support to MS and PhD students who need financial assistance in the conduct of their thesis or dissertations.

Grantees under the Undergraduate Scholarship Program

NAME	DEGREE
Bautista, Mark Jave A.	BS Agriculture
Esguerra, Jane Pauline M.	BS Agriculture
Garcia, Trisha Anne P.	BS Agriculture
Guevarra, Michael Reigh H.	BS Agriculture
Pablo, Gina Marie V.	BS Agricultural Biotechnology
Pamulaklakin, Daniella Jean E.	BS Agriculture
Ramos, Ebraim R.	BS Agriculture
Dulpina, Eljay Louise R.	BS Agriculture
Magdaluyo, Patricia G.	BS Agriculture
Morong, Lea Joy M.	BS Agriculture
Jove, Bryan Kenneth D.	BS Development Communication
Manrilla, Stephanie Edora P.	BS Development Communication

Grantees under the Degree Scholarship Program

NAME	AGENCY	DEGREE/ UNIVERSITY
Dagandan, Gladys Marie A.	DA-RFO 9	MS Animal Science/UPLB
Villanueva, Ruel L.	LGU-Cotabato	PhD Rural Development/USM
Espiritu, Gian Carlo R.	DA-BAR	MS Agronomy/UPLB
Magcawas, Almira G.	CavSU	PhD Community Development/UPLB
Valdeabella, Mara Shyn M.	DA-BAR	MS Community Development/ UP Diliman

Student Researchers Assisted through the Thesis/Dissertation Assistance Program

NAME	AGENCY	COURSE	SCHOOL	TITLE OF RESEARCH PAPER
Monterey, Carl B.	SLSU	PhD Animal Science	UPLB	Effects of Vitamin C Supplementation on Physiological Performance and Heat Shock Protein 70 Expression Among Heat-stressed Broiler Chickens (*Gallus gallus domesticus* (L.)
Leorna, Marisel A.	VSU	PhD Food Science	UPLB	Physicochemical and Biochemical Profiling of MMAC5 for the Development and Process Optimization of Dehydrated 'Makapuno' *(Cocos nucifera* L.)
Magpantay, Veneranda A.	UPLB	PhD Genetics	UPLB	Genetic Diversity based on SSR Markers and Identification of SNP in *FSHR* Associated with High Egg Production in Philippine Mallard Duck *(Anas platyrhynchos domesticus* L.*)*
Lailani A. Masungsong	UPLB	MS Botany	UPLB	Leaf Architecture of Selected *Cucumis* L. Species

BAR also facilitated the evaluation and selection of the awardees for the DA's Gawad Saka Search for Outstanding Agricultural Scientist (OAS) and Outstanding Agricultural Researcher (OAR). The award is conducted every year to recognize the outstanding scientists and researchers who have contributed to the overall growth of the agriculture and fisheries sector.

In 2017, the winner of the Outstanding Agricultural Scientist award went to Dr. Emma K. Sales, tissue culture expert from USM; while the recipient of the Outstanding Agricultural Researcher was awarded to Dr. Berly F. Tatoy, crop protection expert from DA-RFO 10.

R&D Facilities Development

BAR, through its R&D Facilities Development Program, enhances the capacity of its partner-institutions through the establishment and upgrading of R&D facilities.

In 2017, BAR funded 17 new R&D facilities and upgraded 8 existing facilities. In the same year, BAR completed the establishment of Organic Agriculture Research and Development Centers in every region. The Centers were inaugurated in Ilocos Region, Western Visayas, Davao, and Central Luzon.

Other facilities inaugurated in 2017 were: 1) Fish Processing Nutrition Analytical Laboratory at MSU-General Santos; 2) Agri-Service Diagnostic Laboratory at MSU-General Santos; 3) R&D Center of RMTU–San Marcelino Campus in Zambales; 4) Multipurpose Center for Agriculture, Research, and Technology Products at CLSU; and 5) Mushroom Laboratory of DaCARS.

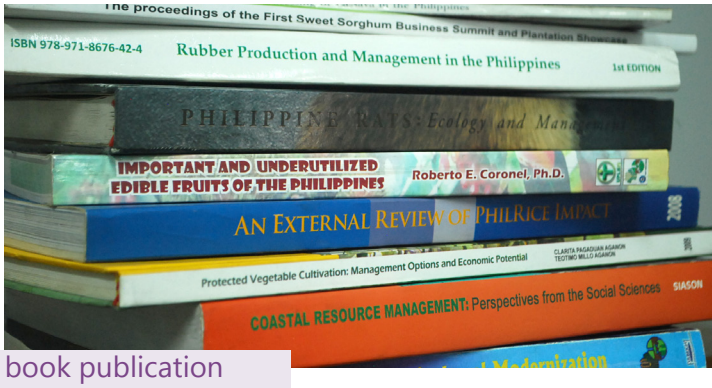
BAR also participated in the groundbreaking activities of its funded IDG projects, namely: 1) UPLB Techno Hub; 2) Tissue Culture Laboratory and Plant Genetic Resource Center SOCCSKSARGEN; 3) Multipurpose Research and Development Center of the Davao Region Upland Agriculture Research Station.

Scientific Publication Grant

For 2017, BAR, through its Applied Communication Division (ACD), supported 28 R&D undertakings of institutions, organizations, and scientific/professional societies under the Scientific Publication Grant (SPG). These included the holding of 15 conferences/ symposia/workshops, coordinating 8 knowledge management (KM) projects, and publishing 5 book projects.

The on-going book projects under SPG included: 1) "Abaca Virus Diseases: Epidemics and Control" of UPLB FI; 2) "Economic Analysis of Climate Change Adaptation Strategies in Selected Coastal Areas in Region XII" of USM; 3) "Mushroom Feast: A Collection of Filipino Mushroom Recipes" and 4) "Kwentong Katutubo sa Klimang Nagbabago (Indigenous Knowledge and Conservation and Promotion for Climate Change Adaptation" of UPLB; and, 5) "BSU R&D Harvest: Technologies and Products from 100 Years of R&D Work" of BSU.

workshops



book publication

exhibits and fora

R&D Technology Commercialization Center

Since its establishment in 2009, the R&D Technology Commercialization Center (Tech Com Center) has continuously been showcasing generated technologies and products from various BAR-funded research initiatives. Through the Tech Com Center, located at the ground floor of RDMIC Building, BAR puts a face in its two flagship programs: NTCP and CPAR.

Among the new products displayed at the Tech Com Center are organic carrot soap, organic cucumber soap, pigeon pea herbal tea, pigeon pea roasted coffee, rosella dried calyx, kamias prunes, kamias sinigang powder, YML dried kamias, Mi Grota Tuyo ni Gus, squash noodles, JE's special arrowroot cookies, maracuja flavored wine calamansi, Yulaik's liptone wine, and Yulaik's mango wine.

The products displayed at the Center were also featured during the NTF. Through this, the Tech Com Center was able to reach a wider audience and generate higher level of inquiry about the products.

The Tech Com Center is open to all interested individuals. Some of the visitors of the Tech Com Center composed of students, foreign media partners, and key personalities including Ramon Magsaysay Jr., former senator and congressman; Danilo Francisco Luna, director of the DA-Internal Audit Service; Rep. Abdullah Dimaporo of the 2nd District of Lanao del Norte; Sandy Sr. Ondis, mayor of Siruma, Camarines Sur; and Maria Alilia Maghirang, agricultural analyst of the Philippine Agriculture Office in Seoul.

Knowledge Management

Knowledge Management (KM) is an important pillar of R&D in realizing the very heart of BAR's mandate which is to bring relevant information and technologies to the people. This strategy is not limited to sharing and reusing knowledge and information, but more importantly, on how these are being effectively managed for their optimum use.

The bureau's KM program focuses on technology and information dissemination from technology generators to users. To ensure that information and knowledge generated from supported researches reach the intended users and stakeholders, BAR produces and packages knowledge products using different media forms. It also capacitates its manpower through trainings and mentorship program.

Information and Knowledge Management (IKM) Mentorship Program

On 12-15 September 2017, BAR, in collaboration with SEARCA, launched the "Information and Knowledge Management (IKM) Mentorship Program: Communicating Agriculture and Fisheries Research for Inclusive and Sustainable Development (CAFRISD)".

The IKM Mentorship Program of SEARCA was first presented to BAR Director Nicomedes Eleazar on 31 July 2017 at BAR. The meeting was attended by selected staff from SEARCA, UPLB-CDC, and BAR.

The IKM Mentorship Program aims to capacitate the information officers of the Department on how to effectively and efficiently manage knowledge and information generated from R&D.

IKM MENTORSHIP

Information and Knowledge Management (IKM) Mentorship Program: Communicating Agriculture and Fisheries Research for Inclusive and Sustainable Development

Orientation and 1st Face-to-Face Session

12 - 15 September 2017 | SEARCA, Los Baños, Laguna

The mentorship program is a first-of-its-kind, as it uses the blended learning approach, consisting of face-to-face and series of online sessions. It is designed to have two batches of trainees from the DA-Regional Field Offices and DA-BFAR regional offices for 18 months.

The program has four scheduled face-to-face sessions that enabled learner-participants to focus on developing their knowledge and skills in reporting agricultural and fisheries researches to different stakeholders, science communication and knowledge management concepts, publication writing and production, and photography. They were also exposed on video production process as well as fundamentals of new media writing and production.

Since the program is conducting online sessions, an online learning platform called *Canvas LMS*, was also introduced to the learner-participants, particularly on its use and navigation.

Another component of the program is the capstone project which the learners will submit at the end of the training. It consists of all their learnings as well as their proposed KM project for implementation to all regions.

Seminar Series

For 2017, BAR, through the Applied Communication Division, conducted 12 in-house seminars, 3 regional seminars, and 1 international seminar. To further reach individuals interested to attend the seminar, the topics were post and promoted weeks prior to the actual date of the seminar through BAR's official Facebook page. The conduct of the seminar were also livestreamed for the benefit of those who could not go to the venue.

Among the seminar topics that garnered the biggest crowd were:

February seminars:

Cultivation Technology of White Oyster Mushroom
Mushroom Product Processing and Cooking Demo
(559 attendees)

March seminars:

Promotion of Vertical Gardening for Food Production in Urban Communities
Cooking Demo on Healthy Salad and Juices from Fruits and Vegetables
(429 attendees)

November seminars:

Production Technology using Hydroponics
Production Technology using Aquaponics
(424 attendees)

Seminar featuring mushroom production held in Hong kong gathered more than 800 attendees.

@DABAROfficial

BAR maintains three official Social Media accounts (Facebook, Instagram, and YouTube: @*dabarofficial*) for wider audience reach.

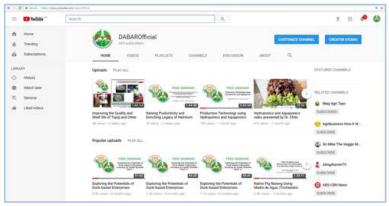
Aside from announcing seminar dates and activities on BAR's Facebook page, it also serves as a venue to post and upload press releases and post-activity events and as a platform where BAR's clients are able to give immediate feedback (i.e. inquiries and suggestions). Likewise, BAR's FB page provides livestream for all its BAR Seminar Series, since the venue is limited to Quezon City only. Through the FB Live, more clients are being catered providing a wider audience reach.

For 2017, 161 photo releases, 3,216 photos, 62 articles, 50 technologies, 30 videos, and 41 advisories were posted and uploaded on the BAR's Social Media accounts.

Quick Stats

(As of Dec. 2017)

FACEBOOK	13, 817 likes	14, 296 followers
INSTAGRAM	186 followers	ave. of 10 likes/post
YOUTUBE	664 subscribers	37104 total views



UPLOADED:

Photorelease: 161
Photos: 3,216
Articles: 62
Technologies: 50
Videos: 30
Advisories: 41

Top 5 Inquires:

- *mushroom*
- *aquaponics*
- *seminar topics*
- *job inquiries*
- *cacao*

Reviews on BAR's official FB Page:

Romeo Adoviso reviewed Bureau of Agricultural Research – 5★
19 February 2017 ·
Mabuhay DA BAR, ang isa sa mga tamang lugar na nararapat tunguhin ng bawat mamamayang Pilipino. Ang kaalaman ay kapangyarihan na isang sandata upang mapagwagihan ang kahirapan, gutom at climate changes.
Like Comment Share

Allan Boomer reviewed Bureau of Agricultural Research – 4★
24 February 2017 ·
Outstanding in agriculture research and simply excellent in knowledge transfer of these output to the Filipino people!!!!
Like Comment Share

Grin Ilustrisimo reviewed Bureau of Agricultural Research – 5★
2 September 2016 ·
To its best effort of assistance..truly at their service!
Like Comment Share

Alice Deejay Concepcion reviewed Bureau of Agricultural Research – 4★
24 March 2017 ·
am happy for the effort reaching out urban household as part of your community service educating us how to protect our environment, to be more productive by using our limited space and creativity. brilliant idea! i suggest you need.more.effor.in disseminating your future actvities.
Like Comment Share

Maar Te Lang reviewed Bureau of Agricultural Research – 5★
20 September 2017 ·
there trainings and seminars are adaptable and very knowleagable...Amazings and wonderful for people like us who loved to learn more for our daily adaptations that could help for our productivity in life..Thanks po na marami

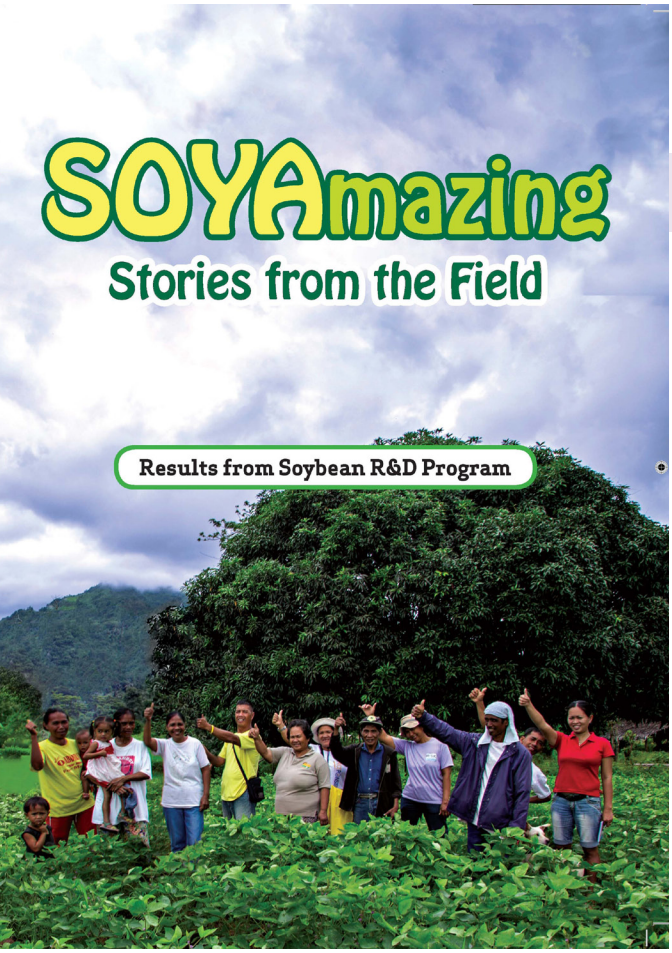
TechnoPercy Flores reviewed Bureau of Agricultural Research – 5★
17 hrs ·
BAR has done a good job providing Modern filipino farmers latest updates on farming, processing and techniques from research institutions. The monthly free seminars has enlightened attendees on the importance of Agriculture and farming..
Like Comment Share

Publications & IEC Materials

The bureau's regular publications, *BAR Chronicle*, the official monthly newsletter; and *BAR R&D Digest*, the quarterly magazine, continue to feature and highlight R&D activities and research-generated technologies.

In partnership with AFACI, BAR continued its distribution of IEC materials. Brochures, magazines, newsletters, and other publications reproduced by BAR were distributed during seminars, trade fairs, and exhibits.

For 2017, ACD was able to package 155 regular and special publications and reproduced 345,000 IEC materials of 7 kinds (i.e. brochures, flyers, crop calendars, DVDs, books, manuals, and handouts). As for the 54 press releases sent to media outfits, 37 were published in dailies.



Books

BAR, through ACD, assisted in launching four books:

1. ***SOYAmazing Stories from the Field: Results from Soybean R&D Program***

   (Launched during the opening of the 13th National Technology Forum, 8 August 2017, Quezon City)

2. ***Compendium of BAR-Funded Projects under the National Organic Agriculture Program 2011-2016***

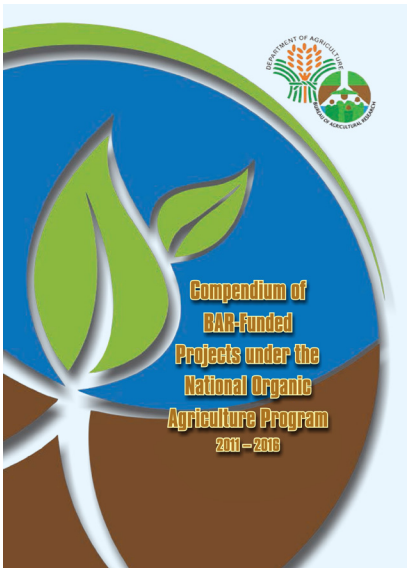
   (Launched during the 14th National Organic Agriculture Congress, 23-26 October 2017, Cagayan de Oro City)

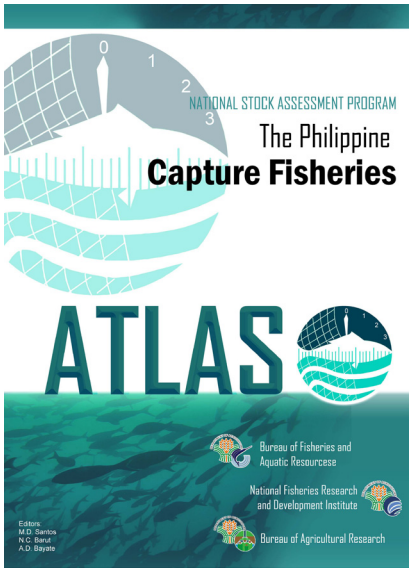
3. ***National Stock Assessment Program: The Philippine Capture Fisheries Atlas***

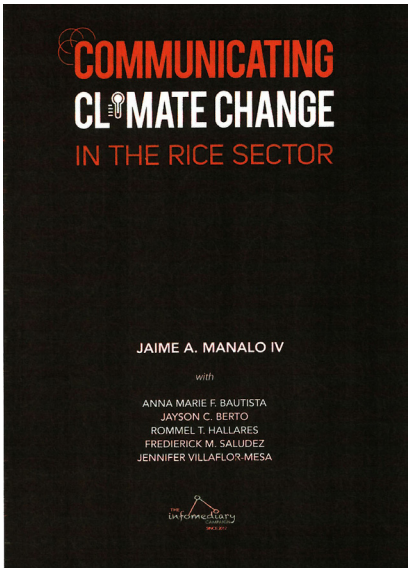
   (Launched during the 29th National Research Symposium Awarding Ceremony, 27 November 2017, Quezon City)

4. ***Communicating Climate Change in the Rice Sector***

   (Launched during the 2017 National Conference of the Association of Development Communication and Educators and Practitioners, 1 December 2017, Iloilo City)







Intellectual Property Management

BAR, through TCD, continuously provides assistance to its clients through the intellectual property (IP) applications such as trademark, patent, and utility model. Apart from this, IP management is also a continuing activity of the bureau. IP management includes novelty spotting, evaluation of projects found with IP potential, drafting of applications conforming with the Intellectual Property Office (IPO) requirements, compliance with the IPO findings, and corrections of findings to meet the examiner's preferences.

IPR applications awarded during the 13th National Technology Forum include:

Galactomannans from makapuno endosperm and the process of producing the same – Dr. Ma. Judith Rodriguez of PCA-Albay Research Center (Patent)

THE BARROWS – Mr. Robert Sto. Domingo (Trademark)

Daerrys – Central Luzon State University (Trademark)

Nvcitpro – Nueva Vizcaya State University (Trademark)

Azúcar de Lanuza – FREEDOM, Inc. Sitio Ipil Winemakers Association, (SIWA), Surigao del Sur (Trademark)

Jovimin – Department of Agriculture-Regional Field Office 1; Dr. Jovita Datuin (Trademark)

Nature's Farmacy Nature...The Healer – Mr. Arturo Tanco, Jr. (Trademark)


plantwise
plantwise
CABI
feed more

International Partnerships

Collaboration is important in implementing R&D programs and activities. Realizing this, BAR maintains its existing linkage and continues to forge new partnership with international institutions to allow knowledge and resource sharing. Fostering linkages is one of BAR's strategies in finding effective and sustainable solutions to address issues besetting agri-fishery R&D.

Sharing of knowledge and resources ensures the continuous progress of the R&D sector. These collaborations also support the vision of Philippines towards a progressive agriculture and fisheries industry.

Asian Food and Agriculture Cooperation Initiative

AFACI is an inter-governmental and multi-lateral cooperation body that aims to improve food production, realize sustainable agriculture, and enhance extension service of Asian countries by sharing knowledge and information on agricultural technology.

AFACI, based in Jeonju, South Korea, is composed of 14 member-countries, namely: Bangladesh, Bhutan, Cambodia, Lao PDR, Indonesia, Kyrgyzstan, Mongolia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam, and Korea. It endeavors to accomplish its goals through multilateral projects, international trainings, program workshops and symposiums.

In the Philippines, AFACI projects are managed by DA, through BAR. DA Usec. Bernadette Romulo-Puyat serves as the national representative while BAR Director Nicomedes Eleazar is the head of the AFACI-ATIN project.

Five on-going projects funded under AFACI were evaluated during the "DA-BAR-AFACI Project Review cum Evaluation Meeting" held on 24-26 April 2017. Leading the activity was BAR Director Nicomedes Eleazar, who was joined in by a panel of evaluators composed of Dr. Edralina P. Serrano of UPLB, Ms. Virginia L. Agcopra, national project coordinator of FAO-BAR project; and Engr. Roberto G. Villa, BAR's technical expert.

Among the five projects presented included: 1) "Collection, Characterization and Distribution of *Vigna sp*. and Pigeon Pea Germplasm to Promote Use in the Philippines" by Lea H. Villavicencio of the National Plant Genetic Resources Laboratory, UPLB; 2) "Application of Improved Postharvest Handling Techniques of Banana Grown by Farmers in the Philippines (Phase 2)" by Dr. Perlita A. Nuevo of the Postharvest Training and Research Center, UPLB; 3) "Construction of the Asian Network for Sustainable Organic Farming Technology" by Mr. Rodelio B. Carating of the Bureau of Soils and Water Management; 4) "Construction of Epidemiology Information Interchange System for Migratory Disease and Insect Pests in Asia Region: Assessment of Rice Plant hoppers Populations and Viruses in the Philippines" by Mr. Genaro S. Rillon of the Philippine Rice Research Institute; and 5) "Development of Locally-Appropriate GAP Programs and Agricultural Produce Safety Information Systems in the Philippines" by Mr. Jan Vincent Tecson of the Bureau of Agriculture and Fisheries Standards.

Centre for Agriculture and Biosciences International

The Philippines has partnered with CABI since 1993. Since then, collaborative activities in R&D including capacity building, and information and microbial resources have been conducted. Along with the access to scientific services and resources, the Philippines has been actively taking part in CABI's governance and policies.

Representatives from CABI met with officials of BAR on 13 June 2017 to discuss the Philippines' membership to CABI. The visit was instrumental in strengthening partnerships between the two institutions. Much of what was talked about during the meeting focused on distinguishing avenues for CABI to funnel in significant assistance to the country's agricultural sector via its partnership with BAR.

CABI was represented by its director for memberships, Dr. Qiaoqiao Zhang and its Southeast Asia regional director, Dr. Sivapragasam Annamalai. They were met by BAR director, Dr. Nicomedes P. Eleazar; assistant director, Dr. Teodoro S. Solsoloy; IDD head, Ms. Digna L. Sandoval; and selected technical staff from IDD.

Dr. Sivapragasam pointed out that BAR is instrumental for CABI to make its presence more visible in the country. Ms. Sandoval and Dr. Solsoloy shared to the representatives the possible entry points in agricultural research for collaborations with CABI. These include research initiatives addressing the current armyworm infestations affecting vegetable farms in Luzon, priority thrusts on the country's cacao industry, and institutional development.

Much of CABI's work here in the Philippines involved the dissemination of results from agricultural research done through a global network of centers.

CABI's partnerships with it member countries is characterized by close interaction. Member-countries take on an active role in the drafting of proposals on how CABI can transfer aid to a nation's farmers. Dr. Zhang reiterated that CABI would like to intensify their communication with agencies like BAR so that the organization can efficiently engage with the country in resolving problems in agriculture.

A consultation meeting with Dr. Arnaud Costa of CABI - Southeast Asia was conducted on 14-16 December 2017 to commence possible collaboration on a research project regarding onion armyworm. This is in response to the first outbreak reported in 2016 which occurred in Tarlac, Nueva Ecija, and Pangasinan. Experts from UPLB and PSAU were also invited to join the discussion about the on-going studies being conducted and what can still be done in preventing and addressing the problem.



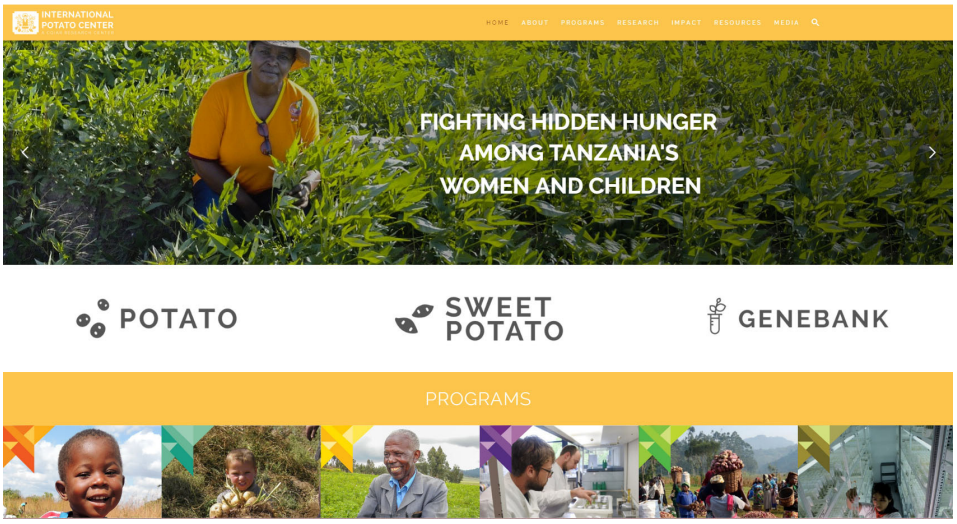

International Potato Center

The International Potato Center (*Centro Internacional de la Papa* or CIP) leads the research and other related activities on potato, sweet potato, and other root and tuber crops for the reduction of poverty and attainment of food security in developing countries. It is one of the specialized centers of the CGIAR.

Dr. Samarendu Mohanty and Ms. Arma Bertuso of CIP met with BAR officials on 2 October 2017 to discuss possible projects to be conducted in partnership with the bureau to promote sweet potato and potato for income and food and nutrition security. The diversification and greater water-use efficiency of cropping systems and the potential reduction of malnutrition through the orange-fleshed sweet potato varieties are also among the objectives.

Proposed activities were related to varietal selection and development, adaptability trials, implementation of advanced technologies for farmers and other stakeholders, creation of local seed production systems, and product commercialization.

The International Potato Center, known by its Spanish acronym CIP, is a part of the CGIAR, a global research partnership for a food-secure future.CIP, with headquarters in Lima, Peru, is a root and tuber research-for-development institution delivering sustainable solutions to the pressing world problems of hunger, poverty, and the degradation of natural resources.



UK-Biotechnology and Biological Sciences Research Council

The Newton Fund is an initiative of the British Embassy that aims to support R&D programs of countries with emerging economy including the Philippines, China, and Thailand. The British Embassy perceived that R&D is an essential component to achieve economic sustainability as well as their partner countries. This initiative was funded under the British Council's UK-Biotechnology and Biological Sciences Research Council (BBSRC) with a total budget amounting to £735M for a period of seven years (2014-2021). Under the R&D partnership, the priority will be the swine and poultry research.

The Newton Fund aims to support innovative fundamental, strategic or applied research that will contribute to and underpin development of novel strategies to diagnose, prevent, manage or treat endemic, exotic, zoonotic and emerging microbial disease of swine and poultry, to promote safe, healthy, resilient and sustainable food production systems and reduce the potential incidence of zoonotic disease.

On 19-20 October 2017, a panel meeting was conducted for the UK-China-Philippines-Thailand Swine and Poultry Research Initiative Call 2017. Based on the competitive, fair and transparent peer review process of the proposals received, projects will be funded with BBSRC and BAR funding in full the agreed UK cost and Filipino cost, respectively. The projects for BAR funding will focus on researches on rapid diagnostics and control strategies for enteric bacterial pathogens in Philippine poultry production, and on a strategic approach to identifying and combating porcine reproductive and respiratory syndrome virus outbreaks and other porcine viral diseases.

This initiative was participated by the bureau as part of its commitment to provide the needed technologies for the Philippine swine and poultry industry, and to enhance its human resource to effectively achieve competitive, sustainable and resilient agriculture and fishery sector as aligned with the thrusts and priorities of the Department.




Food and Agriculture Organization

The project will conserve globally important agrobiodiversity (of rice, mungbean, taro, yam, banana, abaca, and others) in traditional agroecosystems. It will have an agroecosystem and landscape perspective, maintaining the provision of ecosystem services on which agrobiodiversity conservation depends, and addressing threats originating in the broader landscape. It will help ensure favorable policy conditions; consolidate community-based governance; strengthen technical and organizational capacities at individual and community levels; promote market-based incentives for agrobiodiversity conservation; and create conditions for further nationwide replication.

The project, "Dynamic Conservation and Sustainable Use of Agrobiodiversity in Traditional Agroecosystems of the Philippines," is funded by GEF and is being implemented by FAO and BAR, as the lead executing/coordinating agency for the project.

Three municipalities have been identified as project sites, namely: Hungduan and Hingyon in the province of Ifugao, and Lake Sebu in the province of South Cotabato.

In 2017, initial activities have been implemented to three main components of the project: 1) Mainstreaming agrobiodiversity considerations into policy and

legal frameworks, development strategies, and institutional structure; 2) Activities to enhance and expand dynamic conservation practices for agrobiodiversity in three pilot communities; and 3) Dissemination of information, awareness raising, and preparations for scaling-up.

To ensure that the project is inclusive and participatory, a series of inception workshops were conducted first at the national level followed by local inceptions in project pilot sites.

The national inception workshop was held on 27-28 March 2017 in Quezon City. It was attended by Agriculture Undersecretary Segfredo R. Serrano, BAR Director Nicomedes P. Eleazar, and FAO Philippines Representative Jose Luis Fernandez. There were 65 participants, representing various government agencies, NGOs, academe, and FAO Asia Pacific and headquarters representatives, who attended the event and contributed in the drafting of the projects' annual workplan.

Meanwhile, the local inception workshops were conducted on 4 May 2017 in Banaue, Ifugao and on 11 May 2017 in Lake Sebu, South Cotabato. The activities aimed to orient community officials, farmer groups, and local government officials on project components and to get their commitments.

Institutional Updates

- About BAR
- Financial Overview
- Annual Major Events
- Awards and Recognitions

ABOUT BAR

BAR is an attached agency of DA tasked to coordinate agriculture and fisheries research and development and ensure the application of its full potential to improving the sector. It was created in 1987 through Executive Order 116 to ensure that agricultural research is coordinated and undertaken for maximum utility to agriculture. It is mandated to tap farmers, farmers' organizations, and research institutions, including state universities and colleges in the conduct of research for the use of the DA particularly, the farmers and fisherfolk.

Vision

"A better life for Filipinos through excellence in agriculture and fisheries research and development."

Mission

"To attain food security and reduce poverty through technology-based agriculture and fisheries sector."

R&D Thrusts

1. Food security
2. Increased productivity and profitability
3. Poverty eradication and people empowerment
4. Sustainable agricultural development
5. Global competitiveness

Strategic Approaches

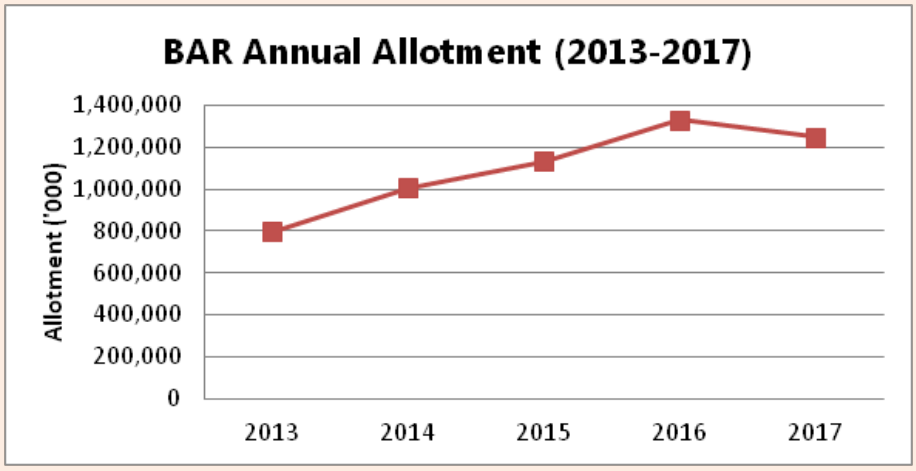
1. Relevant and innovative technology and information generation
2. Community-based technology development and validation
3. Responsive technology commercialization
4. Agribusiness development
5. Public-private partnership
6. Institutional development
7. Local and international linkaging
8. Information communication technology management
9. Knowledge management
10. Provision of favorable research policy environment

FINANCIAL OVERVIEW

The annual allotment for R&D has gradually increased for the last five years (2013-2017).

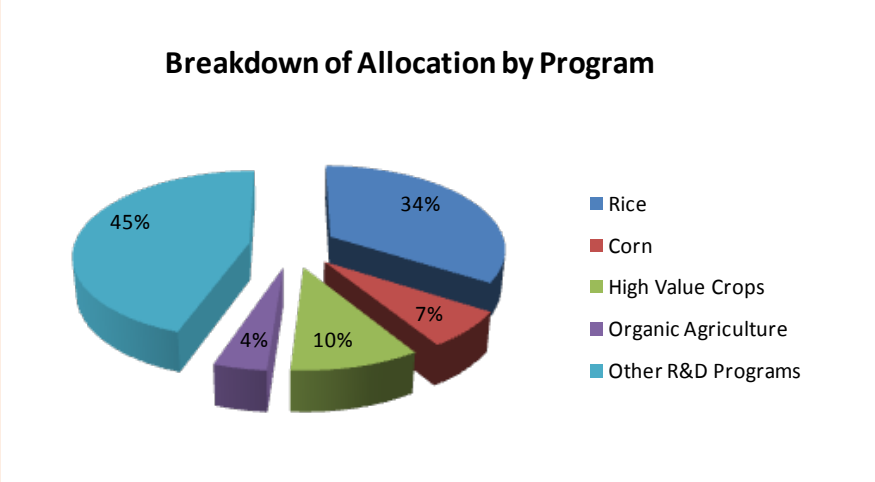
In 2017, the annual allotment has slightly decreased from Php1.33B to 1.248B which is 6.24 percent.

Figure 1. BAR's Annual Allotment for the last five years



A major chunk of the 2017 R&D allotment went to R&D Programs of BAR (45 percent) and National Rice Program (34 percent). The R&D Programs include implementation of various research activities under Biotechnology, Climate Change, CPAR, NTCP, and IDG.

Figure 2. Breakdown of Allocation by program



ANNUAL MAJOR EVENTS

In an effort to ensure that research results and technologies generated from R&D reach their intended beneficiaries, BAR annually conducts two major events: the Agriculture and Fisheries Technology Forum and Product Exhibition (NTF) every August, and the National Research Symposium (NRS) every October.

The NTF is an annual showcase of viable technologies developed by SUCs, DA national and regional offices, and other R&D partner-institutions. This event also serves as an opportunity to strengthen the linkage between public and private sectors.

Meanwhile, the NRS is a yearly competition featuring competing R&D paper entries of researchers and scientists from different R&D institutions throughout the country. It serves as a means to recognize the vital role of researchers as catalyst of developing R&D that matters to the productivity of the agriculture and fishery sector.

13th Agriculture and Fish

13th Agriculture and Fisheries Technology Forum and Product Exhibition

In 2017, the 13th NTF was held at the BAR Grounds on 8-10 August 2017. With the theme, "Bringing Products of R&D to the Filipino Farmers, Fisherfolk, and Agripreneurs through Technology Transfer and Commercialization," the event highlighted research-generated technologies that can provide livelihood and business opportunities for the farming and fishing communities.

The activity kicked off with a thanksgiving mass officiated by Rev. Toto Jaranilla of Mount Carmel Parish. This was followed by a ribbon-cutting ceremony led by Agriculture Undersecretaries Segfredo Serrano and Bernadette Romulo-Puyat, and Assistant Secretary Leandro Gazmin. Joining them were BAR Director Nicomedes Eleazar, BAR Asst. Director Teodoro Solsoloy, Quezon City Police District Director Guillermo Lorenzo Eleazar, and BAR-TCD Head Anthony Obligado.

More than 50 exhibitors participated in the event including DA-RFOs, BFAR-ROs, SUCs, and other R&D partner-institutions showcasing their various research breakthroughs, products, services, and technologies supported by BAR under NTCP.

Director Eleazar delivered the opening message, reiterating the importance of NTCP as an instrument for the stakeholders to economically benefit from these products of research. He cited some of the successful products supported by BAR including adlay; fruit wines that are now available in the mainstream market; and rimas that reached Hong Kong for acceptability trials. He also acknowledged the private sector that adopted the technologies and helped in sustaining the technology.

Other highlights of the event were the launching of the BAR R&D Portal and soybean coffeetable book, "SOYAmazing Stories from the Field: Results from Soybean R&D Program". The portal is an information system containing essential data on the different R&D projects funded by BAR from 2005 to present. Meanwhile, the

eries Technology Forum and Product Exhibition

29th National Research Symposium

coffeetable book featured 31 stories of farmers, farmer organizations, and entrepreneurs whose successes were credited, in one way or another, to the various soybean technologies generated by R&D institutions under the DA Soybean National Program. In relation to the intensified promotion of soybean, BAR also conducted the second-leg of the Soybean Cooking Contest for the Luzon cluster.

Seven Intellectual Property (IP) certificates were awarded during the opening day, one for patent and six for trademarks. These were: 1) Galactomannans from Makapuno Endosperm and the Process of Producing the Same of PCA-Albay Research Center; 2) Jovimin Balls of DA-RFO 1; 3) NVCITPRO of NVSU; 4) Daerry's of CLSU; 5) Azucar de Lanuza of Sitio Ipil Winemakers Association and FREEDOM, Inc.; 6) Nature's Farmacy Nature The Healer of Mr. Arturo Tanco, Jr; and 7) THE BARROWS of Mr. Robert Sto. Domingo. The awarding of IPs was made possible through the assistance and services provided by BAR-IPRMS.

This year's central display setting featured R&D projects that are being coordinated by BAR and the supported technologies that produced high-impact results. These included soybean, adlay, fruit wines, mushroom, heirloom rice, queen pineapple, rimas, tilapia ice cream, kapis, apiculture, native animals, and chevon products.

Other personalities who graced the activity were: Representative Abdullah Dimaporo of the 2nd district of Lanao del Norte; ATI Director Luz Taposok; DA-ICTS Director Clint Hassan; University of the East Caloocan Chancellor Zosimo Battad; UPLB Vice Chancellor for Research and Extension Rex Demafelis; ISU Vice President for Research, Development, and Extension and former BAR Director William Medrano; TAU Vice President for Research, Extension and Training Tessie Navarro; Atty. Rhaegee Tamana, chief of staff of Senator Cynthia A. Villar; Ms. Evi Wulandari, junior professional officer, FAO Representation in the Philippines; and Mrs. Lorna Daffon of PTV 4's Mag-Agri Tayo Program.

Best Products

Best Booths

Best Products and Best Booths Awards

The award for the "Best Product" was bestowed to the product of research and that is unique, has an appropriate packaging and labeling, possesses market potential, and is relevant in achieving food security and health and wellness. This year, the apali flour-based products of the DA-RFO 11 bagged the "Best Product" award. Apali is a local name for lesser yam and has been identified in Region 11 as a climate-resilient commodity. Product development initiatives for apali have been undertaken producing apali flour and various apali flour-based products (cookies, crinkles, and munchkins). The second place went to DA-RFO 5 with their zero waste products from squash, a technology that showcased making use of all the different parts of the squash (skin, flesh, seeds, etc.). The third prize went to DA-RFO 2 for their maize silky sip, a healthy beverage made from boiled corn silk, while the adlay sweet cone of DA-RFO 4B and the fishtail palm sugar of DA-RFO 10 came in fourth and fifth places, respectively.

The "Best Booth" award was given to the exhibit booth which exemplified originality and creativity both in concept and design. The use of indigenous materials, organization of displays, properly labeled products and information materials, and knowledgeable and friendly staff also formed part of the criteria which the judges looked for when choosing the winner for the best booth. For 2017, the DA-RFO 2 won the first prize. Their booth featured a jeepney-like structure with an intricate design made from the seeds of the region's champion commodities. Getting the second and third places were DA-RFO 5 and DA-RFO 10, respectively. Meanwhile, the DA-RFO 4B and DAF-ARMM were in fourth and fifth places.

Winners received research grants under BAR's NTCP worth Php 2M for the first prize, Php 1.5M for the second prize, and Php 1M for the third prize.

Soybean Coffeetable Book

A coffeetable book titled: "SOYAmazing Stories from the Field: Results from Soybean R&D Program" was launched to provide the sector a glimpse on how the local soybean industry is doing and inform the public on what DA, through HVCDP and BAR, has been doing since the program was launched in 2011. Through this publication, R&D efforts are being showcased helping the farming communities to produce and earn more by adopting the interventions and technologies generated from the program.

The book featured 31 beneficiaries/adopters including farmers, farmer organizations, and entrepreneurs whose successes can be credited in one way or another to the various soybean technologies generated by R&D institutions under the DA National Soybean Program.

Soybean Cooking Contest

The second leg of the "Soybean Cooking Contest for Luzon" was held during the opening day of the NTF on 8 August 2017. The contest aimed to promote the health benefits of organically-produced soybean by developing original healthy soya-based food recipes.

Students from the BSU, namely: Pamela Jeane Remiendo and Maravilla Senado, took home the first prize. They prepared a unique, colorful soya-based dish called "Rolled Chicken Fillet with Etag- Soybean in Honey Mustard Soybean Tidbits Sauce". Ms. Rodeliza Flores, coach of the BSU students, said, "the dish is easy to prepare, affordable, and most importantly, healthy and nutritious." As first prize winner, BSU received Php1M research grant and a plaque.

The second place went to the dish "Soydinera Espesyal" prepared by students from the SLSU-JGE, while the third place went to "Soya Pastel with Soya Milk Sauce" prepared by ISU students.

Serving as the judges were: Chef Jam Melchor, owner of Yes Plate Manila; Mr. Ralph Rivera, proprietor of Soya Bar Food Chain; and Ms. Thelma Estera, professor from CLSU.

13th NTF








Seminar Series and Technology Demonstrations

The second day of the NTF featured seminar series and technology demonstrations including topics supported by BAR through NTCP. Among these included: soybean, cheese from goat's milk, bee products, mushroom, rubber, fisheries, and Hoya. Technology generators, product developers, and even walk-in participants were provided with information on various available packaging materials for specific products.

Seminar Topics:

Packaging Materials for Different Kinds of Products
Mr. Allan Bucu, RNBP Enterprise

Diversity of Hoya in the Philippines
Mr. Fernando Aurigue, DOST-PNRI

The Oceans and Fisheries Partnership
Mr. Len R. Garces, USAID Oceans and Fisheries Partnership Bangkok, Thailand

Production of Different Types of Cheese from Goats' Milk
Dr. Olivia Emata, UPLB-DTRI

Soybean Production for Specific Soyfood Markets
Mr. Elmer Enicola, UPLB-IPB

Organic Production System and Irradiation Technology in the Production of Safe and Quality Bee Products
Dr. Zenaida De Guzman, DOST-PNRI

Mushroom: Value Chain Analysis
Dr. Emily Soriano, DA-RFO III

Evolution of Rubber Propagation Technology
Mr. Roger Bagaforo, DA-RFO IX

VIPs Viewing the Exhibits

During the opening day, Agriculture Undersecretaries Segfredo Serrano and Bernadette Romulo-Puyat and Assistant Leandro Gazmin took the time to go around and visit the different booths and product exhibits.

Representative Abdullah Dimaporo of the 2nd district of Lanao del Norte, and ATI Director Luz Taposok also went around the product exhibit.

Showcased in the exhibit were unique and innovative products generated from research and development (R&D) initiatives of various DA-RFOs and BFAR regional offices, selected state universities and colleges ,and private sector.

Agriculture Undersecretary Bernadette Romulo-Puyat showing "Marang Ice Cream" at the ARMM booth.

Agriculture Undersecretary Segfredo Serrano and RTD Ma. Melba Wee at the booth of DA-RFO IX

BAR Director Nicomedes Eleazar and Quezon City Police District Director Guillermo Lorenzo Eleazar showing "Malunggay Powder" and "Malunggay Polvoron" developed by SLSU-JGE Campus.

29th National Research Symposium

For 2017, 19 R&D papers were announced as "AFMA Best R&D Papers" during the closing and awarding ceremonies of teh 29th NRS held on 23 November 2017 in Quezon City. Leading the awarding of winners were BAR Director Nicomedes P. Eleazar, Asst. Dir. Teodoro S. Solsoloy, and BAR-IDD Head Digna L. Sandoval.

From the 19 winners, 5 gold, 7 silver, and 7 bronze awards were given. Winners were selected from six competing categories, namely: 1) basic research, 2) applied research TG/IG (agriculture), 3) applied research TA/ TV (agriculture), 4) socio-economics research, 5) applied research TA/ TV (fisheries), and 6) development research (agriculture).

AFMA Best R&D Paper for gold, silver, and bronze received a trophy and cash awards Php 100,000; Php 75,000; and Php 50,000, respectively. Likewise, all Gold Winners received a Php2M worth of research grant (proposal-based). Meanwhile, the winners of the AFMA Best R&D Poster received Php 50,000 (gold); Php 35,000 (silver); and Php 25,000 (bronze).

In 2017, NRS received a total of 151 research paper entries, which is a 13 percent increase from last year's 134 paper entries. Majority (47 percent) of the submission came from the DA-regional field offices, followed by state universities and colleges, staff bureaus and attached agencies, local government units, and private universities. Qualifiers were trimmed down to 58 of which 19 of them presented their papers during the symposium proper.

Winners of AFMA Best R&D Paper (by category)

R&D Paper	Author/s	Agency	Award
A. Basic Research Category			
Screening and Characterization of Stress Tolerant Yeasts in Nipa Sap Fermentation from Cagayan and Quezon Provinces, Philippines	James Paul Madigal and Shirley Agrupis	MMSU	Gold

B. Applied Research - TG/IG – Agriculture Category			
Development and Characterization of Gamma-Amino Butyric Acid (GABA) Rice from Selected Philippine Cultivars	Rodel Bulatao, Marissa Romero, Maricar Castillo and John Paulo Samin	PhilRice	Gold
Variation in Biochemical Composition of Virgin Coconut Oil in Relation to Varietal and Agronomic Factors	Ramon L. Rivera, Ernesto E. Emmanuel and Susan M. Rivera	PCA-ZRC	Silver
Individual and Combined Influences of Glh 14 and TSV1 in MAS-bred Rice Lines Infected with Tungro	Arlen Dela Cruz, Mariechelle Rosario, Ma. Johna Duque, Dindo King Donayre, Cherryl Seville, Christine Flores, Menard Talplacido and Sailila Abdula	PhilRice	Silver
Evaluation and Development of Nutraceutical and Cosmeceutical Products from Saluyot (*Corchorus olitorius*) and Okra (*Abelmoschus esculentus*): Protective and Preventive Alternatives for Health and Wellness	Dr. Edna Oconer, Tres Tinna Martin, Maria Amelia Punla, Christine Dawn Obemio, Ronaldo Bigsang and Angem Descallar	MSU-General Santos City	Bronze
Improved Pregnancy in Water Buffaloes through Synchronization of Ovulation and Fixed Time Artificial Insemination Technique	Eufrocina Atabay, Edwin Atabay, Excel Rio Maylem, Ramesh Tilwani, Ester Flores and Annabelle Sarabia	PCC	Bronze
Phytochemical Content, Antioxidant Capacity and In Vitro Antibacterial Activity of Bran Extracts of Philippine Rice (*Oryza sativa*) Varieties	Amelia Morales, John Edward Zapater, Jay Carl Cacerez and Rosalyn Manaois	PhilRice	Bronze

Winners of AFMA Best R&D Paper (by category)

R&D Paper	Author/s	Agency	Award
C. Applied Research - TA/TV – Agriculture Category			
Development, Evaluation and Commercialization of Village-Level Compact Corn Mill	Michael Gragasin, Jayvee Illustrisimo and Dr. Romualdo Martinez	PhilMech	Gold
Utilization of Coconut Genetic Resources for Sap Sugar Production	Ramon Rivera, Ernesto Emmanuel and Susan Rivera	PCA-ZRC	Silver
Mitigating Banana Fusarium Wilt Tropical Race 4 Through a Farmer-Participatory Approach of Developing Disease Management Strategies	Agustin Molina Jr., Lorna Herradura, Susan Razo, Lavernee Gueco, Vida Grace Sinohin and Cyril Montiel	BPI-Davao, DA-RFO 11, IPB-UPLB, Bioversity International	Bronze
D. Applied Research - TA/TV – Fisheries Category			
Bringing Science to Filipino Table: The Journey and Efforts of National and Multi-national Partners in the Production of Genetically Improved Nile Tilapia (*Oreochromis niloticus L*) for Improved Productivity and Food Security in the Philippines	Dr. Ravelina Velasco, Tereso Abella, Maripaz Perez, Ma. Jocecel Danting, Ruben Reyes, Elena Lanuza, Roniño Del Pilar, Ave Joy Ramos and Roberto Miguel Sayco	CLSU	Silver
E. Development Research Category			
Community-based Participatory Action Research on Integrated Farming Systems in Cebu Province	Joseph Dela Cerna, Virgilio Jakosalem, Victor Geralde, Marya Zea Villaganas, Ma. Ritchille Putong, Kathryn Ylanan and Fabio Enriquez	OPA- Cebu DA-RFO 7	Gold
Transforming Bicol Rice Production with the Rice Crop Manager (RCM) in the Rainfed and Irrigated Lowlands	Corazon Orbon, Tara Christina Machica, Ma. Lakambini Aldecoa, Limberly Bermillo, Maridel Bibay, Marion Noceda, Edgar Madrid, Rodel Tornilla and Elena De los Santos	DA-RFO 5	Silver
CPAR on Irrigated Rice-based Farming System in Leon, Iloilo	Ryan Caldito	LGU-Leon, Iloilo	Silver
Evaluation of Rice Crop Manager (RCM) in Improving Production and Income from Rice Farming in Pangasinan	Jeanette Villareal, Meriam Balansay, Cynthia Ballesteros and Shara Jane Diaz	DA-RFO 1	Bronze

Winners of AFMA Best R&D Paper (by category)

R&D Paper	Author/s	Agency	Award
F. Socio-Economic Research Category			
Intensified Rice-based Agri-bio System Model for Hillyland	Erwin Labadan, Cherlie A. Simene, Decheryvie Payla and Clotilde Jumalon	DA-RFO 10	Gold
Local Mushroom Production Technologies and Markets: Status and Opportunities in Cagayan Valley	Janine Quintal, Lawrence Gaspar, Chonalyn Pascua, Lovelyn Gaspar and Orlando Lorenzana	DA-RFO 2	Silver
Enhancing Innovative Family Enterprise Development (IFED) thru Improved Free Range Chicken Production	Jovita Datuin, Cathy Pastor, Josefina Bueno, Alfredo Santos Jr., Gany Gaspar, Lemuel Abrenica, Liza Ronquillo and Ricardo Collado	DA-RFO 2	Bronze
Creating Climate-Disaster Resiliency in Calamines Group of Islands (Busuanga-Coron-Culion)	Glenn Banaguas, Raeyan Ramos, John Matthew Glico, Victor Angelo Fuentebella, Angelo Mari Regalado, Marlon Co, Alec Chiu Wan, Karina Bernert, Sharlene Yao, Marlo Wisco, Christian Pangilinan, Steve Du, Jeanette Sabocojan, Demiee Grace Sy, Don Jansen Dy, Celandine Javier, Austin Yatco and Alyana Zen Rodriguez	DLSAU	Bronze

Winners of AFMA Best R&D Poster

R&D Poster	Author/s	Agency	Award
Development and Characterization of Gamma-Amino Butyric Acid (GABA) Rice from Selected Philippine Cultivars	Rodel Bulatao, Marissa Romero, Maricar Castillo and John Paulo Samin	PhilRice	Gold
Mitigating Banana Fusarium Wilt Tropical Race 4 Through a Farmer-Participatory Approach of Developing Disease Management Strategies	Agustin Molina Jr., Lorna Herradura, Susan Razo, Lavernee Gueco, Vida Grace Sinohin and Cyril Montiel	BPI-Davao DA-RFO 11 IPB-UPLB Bioversity International	Silver
Development, Evaluation and Commercialization of Village-Level Compact Corn Mill	Michael Gragasin, Jayvee Illustrisimo and Dr. Romualdo Martinez	PhilMech	Bronze

Book Launch of Philippine Capture Fisheries Atlas

During the NRS awarding ceremony, a publication, "Philippine Capture Fisheries Atlas" was launched. A product of BFAR's partnership with the NFRDI and BAR, through its SPG, the atlas features an exhaustive report of the data on fishery resources across the country's regions. The book was realized when NSAP consolidated its data-gathering activities with the use of a nationwide internet database where scientists and researchers from different regions can synchronize their findings in one platform.

In the book, the first chapter provides background information on the history and methodology adopted by NSAP. The following chapters would then present NSAP data on both national and regional levels, for both marine and freshwater resources. The data presented in these chapters include: landed catch and effort, recruitment and distribution patterns, abundance, spawning, and mitigation of a resource in a given fishing ground.

Recognition of Gawad Saka Finalists

During the NRS, seven Gawad Saka finalists were recognized. Gawad Saka is an annual search that recognizes outstanding achievers in agriculture and fisheries representing the stakeholders of the community-farmers, fisherfolk, farm communities, researchers, scientists and organizations. BAR serves as the Secretariat for both the Outstanding Agricultural Scientist (OAS) and Outstanding Agricultural Researcher (OAR) categories.

OAR Finalists

Nominees	Region/Agency	Specialization
Dr. Arthur Dayrit	Region 3/DA-RFO 3	animal husbandry, crop production
Dr. Merlina Juruena	Region 11/PAO Davao Del Norte	plant pathology, horticulture, crop research management
Dr. Berly Tatoy	Region 10/DA-RFO 10	crop protection and production, organic farming participatory research

OAS Finalists

Nominees	Region/Agency	Specialization
Dr. Olivia Damasco	Region 4-A/IPB, UPLB	crop biotechnology (plant tissue culture), crop physiology, plant breeding
Dr. Marissa Romero	Region 3/PhilRice	food science, grain quality and nutraceuticals, value-adding and utilization of rice, rice by-products and other crops
Dr. Felix Salas	Region 8/VSU	environmental chemistry, bio-regulation studies, agricultural chemistry
Dr. Emma Sales	Region XII/USM	molecular genetics, tissue culture, biotechnology

AWARDS AND RECOGNITIONS

Yearly, the bureau takes pride in its accomplishments through the various accolades awarded by research institutions and other agencies. In 2017, BAR was bestowed with 4 institutional awards; and 2 individual recognitions for its staff.

BAR is best performing agency in 2016

The bureau was rated as the "Best Performing Agency" under DA for FY 2016. This was announced during a meeting facilitated by the Performance-Based Incentive System (PBIS) Technical Working Group of the Department.

BAR bested five other staff bureaus of DA, achieving agency performance targets on its Major Final Outputs (MFOs) under the Performance Informed Budget (PIB) of the FY 2016 GAA, as well as the targets for Support to Operations (STO) and General Administration and Support Services (GASS).

BAR also achieved a 100 percent satisfaction rate on the Good Governance Conditions (GGCs) set by the Inter-Agency Task Force on the Harmonization of Government Performance Monitoring, Information, and Reporting Systems (Administrative Order No. 25 s. 2011). Such conditions include maintaining the Agency Transparency Seal and enforcing accountability; maintaining and updating of the posting of all Invitations to Bids and awarded contracts in the PhilGEPS; and compliance with the President's directive on improving all frontline services. BAR scored a total of 95.20 percent in the final screening. Rounding up the six performing agencies under the DA's staff bureau group are BAFS, BPI, BSWM, BAI, and ATI.

BAR recognized as one of ATI's partners in agri extension

ATI celebrated three decades of delivering leadership in extension services in agriculture and fisheries. During its 30th anniversary program on 26 January 2017 at ATI Central Office, various partners in agricultural extension were recognized. BAR was particularly cited for its contributions to the success of the DA's Rice Crop Manager (RCM) project and the e-Extension Program for Agriculture and Fisheries, and for its role in capability building for RDE practitioners. BAR supported the RCM proposal developed by the DA with IRRI in 2015 involving the development of a comprehensive decision support tool that provides farmers with personalized advice, through computers and mobile phones, on crop protection from major pests and on crop management in the growing season, thus increasing the potential for higher yields and income.

Over the years, BAR and ATI have cooperated in each other's initiatives. Recently, BAR partnered with ATI in developing online courses in the e-Learning component of the e-Extension Program. It has also been instrumental in funding an ATI-led project for the training of agricultural development and extension officers of the community or "AgRiDOCs". Conversely, ATI has provided training services and other inputs in the regional implementation of BAR's CPAR program.

BAR's HR receives recognition from CSC

Out of 178 government agencies assessed by the Civil Service Commission-National Capital Region (CSC-NCR), BAR was declared as one of the 63 agencies recognized for reaching the Human Resource (HR) Maturity Level 2 indicators for HR systems and competencies on Recruitment, Selection and Placement, and Rewards and Recognition during the awarding ceremony of the Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM) of the CSC. The event was held on 8 March 2017 at the Novotel Hotel, Araneta Center in Quezon City.

PRIME-HRM is a mechanism used by the CSC to ensure that excellence is met by the agencies in the performance of their respective HR management functions through a program of reward, recognition, empowerment, and continuous development. It covers all national and local government agencies including government-owned and -controlled corporations, state universities and colleges, and regional offices of agencies which have their own HR offices.

The award is given to agencies meeting the HR Maturity Levels 2, 3, and 4 Indicators of PRIME-HRM. Present to give the certificates of recognition to the awardees was CSC Chairperson Alicia dela Rosa-Bala. Receiving for BAR were Assistant Director Teodoro S. Solsoloy and HR Head Ludivina Pelayo.

Based on the HR maturity level achieved, the CSC will provide the necessary interventions for the further development of the HRM program and system of the agency. The conduct of the awarding ceremony is also a strategy by CSC to motivate government agencies to always perform at their best in human resource management.




CSC recognizes BAR's partners in R&D

Four active and dedicated partners of BAR in R&D were recognized by the CSC as among the 2017 Outstanding Government Workers during the awards rites on 20 September 2017 at the Malacañan Palace. This year's Presidential Lingkod Bayan awardees for the individual category were: Ms. Rose Mary Aquino of DA-RFO 2, Dr. Louella Rowena Lorenzana of DA-RFO 4B, Dr. Erlinda Vasquez of PhilRootcrops-VSU, and Dr. Norman de Jesus of PSAU.

Aquino was instrumental in the development of Pinoy Gourmix, the packaging and labeling of which was supported by BAR under its NTCP. As a highly nutritious food resembling porridge, Pinoy Gourmix is being used in various feeding and nutrition programs of government and private agencies. Ms. Aquino also led various BAR-funded R&D projects on legumes (peanut, mungbean, soybean) varietal and technology improvement that helped strengthen the industry in Cagayan Valley region.

Dr. Vasquez is known for her works on managing plant diseases and pests in sweet potato and cassava. As such, under the Corn and Cassava R&D Program, BAR supported the project involving the management of Cassava Phytoplasma Disease through a systematic nationwide survey, characterization, diagnosis, and control; and a project under BAR's IDG for the provision of equipment support for other cassava-related researches.

Dr. Lorenzana is known for her efforts on the control of mango pulp weevil (MPW) aimed at keeping MPW field infestations at low levels especially in the province of Palawan. Together with the DOST-PNRI, Dr. Lorenzana's team from the DA-RFO 4B embarked on a research study that aimed to address possible MPW eradication protocols. This study won in the 23rd NRS of BAR in October 2011. Dr. Lorenzana was also recognized as a Gawad Saka Outstanding Agricultural Scientist in 2008.

Dr. de Jesus cites the conglomeration of BAR-supported projects that PSAU was able to put up together with emphasis on organic production systems as contributory to the award. These include, among others, research and development projects on lotus-tilapia integration, apiculture, adlay, and lotus product development initiatives.

The Presidential Lingkod Bayan Award is conferred to an individual or group for exceptional or extraordinary contributions that had nationwide impact.

Eleazar and Sandoval receive 2017 UPLB alumni awards

BAR Director Nicomedes P. Eleazar and IDD Head Digna L. Sandoval were among the UPLB alumni awardees for 2017. The two BAR officials were recognized during the UPLB Alumni Association awarding ceremonies held on 9 October 2017 at UPLB in College, Laguna. As part of the celebration of the 99th UPLB Loyalty Day and Alumni Homecoming, the activity put into the spotlight the exceptional works and significant contributions of UPLB alumni in their respective fields.

With his outstanding leadership capability as director of BAR from 2004 to present, Director Eleazar received the "Outstanding UPLB Alumnus for Institutional Organization and Development." He was cited for his contributions in the field of research and development (R&D), particularly in leading the formulation of the overall R&D agenda in agriculture and fisheries. Among his many other accomplishments, he was recognized for his involvement in the development of R&D strategic plan and its translation into annual operation targets, including strengthening institutional development of agricultural research institutions in the country, overseeing the coordination of national and regional research programs, and establishing linkages with local and international research organizations for bilateral and multilateral assistance programs.

Meanwhile, Ms. Sandoval was a recipient of the UPLB-College of Agriculture and Food Science "Distinguished Alumna for Institutional Development in Agricultural Research" award. She was given recognition for her dedication, calm resolve, and good rapport with stakeholders that helped in enabling BAR to provide much needed support for agricultural research. These include, to name a few, skills and capability development, upgrading of research equipment, and R&D infrastructure establishment. As the head of BAR-IDD, Ms. Sandoval spearheads the bureau's HRDP aimed at supporting the enhancement of capabilities of the NaRDSAF-member institutions in implementing and managing R&D programs and activities; and the R&D Facilities Development Program aimed at supporting the acquisition of scientific and information technology equipment, and establishment and renovation of R&D facilities.

Director Eleazar, one of the 14 outstanding UPLB alumni awardees, obtained his bachelor's degree in agriculture at UPLB in 1981. Ms. Sandoval, one of the 37 college distinguished alumni, obtained her master's degree in agriculture at UPLB in 2004.

AFACI recognizes Phl's ATIN project and ATIN principal investigator

The ATIN Project in the Philippines, headed by BAR Director Nicomedes Eleazar, was recognized by the AFACI Secretariat as the "2017 Most Outstanding Project". Meanwhile, Ms. Julia A. Lapitan, head of the BAR-ACD, was recognized as the "2017 Most Outstanding Principal Investigator (PI) of ATIN". The announcement was made through an official letter sent by Jang Jung-hee, deputy secretary general of AFACI, on 14 December 2017.

ATIN is one of the projects under the Extension Program that is being coordinated by AFACI, to which the Philippines is a member-country. ATIN is an initiative that aims to build a standardized network and/or web-based information database system for agricultural knowledge and share information among AFACI member-countries. Among its expected outputs include maintenance of AFACI website as a platform to upload and share technological innovations and relevant information; publication and distribution of IEC materials including crop calendars, production guides, etc.; and building network of database on agricultural information from research outputs that can be systematically shared and retrieved by member countries.

Aside from ATIN, the Philippines was also recognized for its Postharvest Project and its PI, Dr. Perlita A. Nuevo, assistant professor, PHTRC-UPLB.

AFACI, established in 2009 in South Korea, is a multilateral initiative aimed to promote sustainable agricultural growth and contribute in the economic development of the Asian region through technological cooperation and networking in food and agriculture sector. Its Secretariat is based at the International Technology Cooperation Center, Rural Development Administration in Jeonju, South Korea.

Annexes

- Directory of BAR Key Officials
- Acronyms Used

Dr. Nicomedes P. Eleazar, *CESO IV*

Lales

Ritual

Obligado

Sandoval

Lapitan

Juanillo

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Resma

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Acronyms Used

ABR	Applied Biotech Research
ACD	Applied Communication Division
AFACI	Asian Food and Agriculture Cooperation Initiative
AMIA	Adaptation and Mitigation Initiative in Agriculture
ASEAN-CRN	Association of Southeast Asian Nations-Climate Resilient Network
ASU	Aklan State University
ATI	Agricultural Training Institute
ATIN	Agricultural Technology Information Network in Asia
AWD	Alternate Wetting and Drying
BAFS	Bureau of Agricultural and Fisheries Standards
BAI	Bureau of Animal Industry
BBSRC	Biological Sciences Research Council
BFAR	Bureau of Fisheries and Aquatic Resources
BPI	Bureau of Plant Industry
BPO	Biotechnology Program Office
BSU	Benguet State University
BSUP	Biotech Scholarship Undergraduate Program
BSWM	Bureau of Soils and Water Management
CABI	Centre for Agriculture and Bioscience International
CARIAC	Caraga Integrated Agricultural Research Center
CaVSU	Cavite State University
CC	Climate Change
CCAFS	Climate Change, Agriculture and Food Security
CELPA	Center for Environmental Law and Policy Advocacy, Inc.
CGIAR	Consultative Group on International Agricultural Research
CHED	Commission on Higher Education
CLIARC	Central Luzon Integrated Agricultural Research Center
CLSU	Central Luzon State University
CPAR	Community-based Participatory Action Research
CSC	Civil Service Commission
CVRC	Cagayan Valley Research Center
DA	Department of Agriculture
DaCARS	Davao Commercial Agriculture Research Station
DBM	Department of Budget and Management
DLSAU	De La Salle Araneta University
DOST	Department of Science and Technology
DTRI	Dairy Training and Research Institute
FAO	Food and Agriculture Organization
FPA	Fertilizer and Pesticide Authority
FREEDOM	Foundation for Rural Enterprise and Ecology Development of Mindanao
GAA	General Appropriations Act
GAP	Good Agricultural Practices
GEF	Global Environment Facility
GIS	Geographic Information System
HRDP	Human Resource Development Program
HVCDP	High Value Crops Development Program

Acronyms Used

ICE	Institutional Capacity Enhancement
ICTS	Information and Communications Technology Service
IDD	Institutional Development Division
IDG	Institutional Development Grant
IEC	Information, Education and Communication
IKM	Information and Knowledge Management
ILIARC	Ilocos Integrated Agricultural Research Center
INM	Integrated Nutrient Management
IPB	Institute of Plant Breeding
IPM	Integrated Pest Management
IPOPhil	Intellectual Property Office of the Philippines
IPRMS	Intellectual Property Rights Management Section
IRRI	International Rice Research Institute
ISU	Isabela State University
IT	Information Technology
LGU	Local Government Unit
MMSU	Mariano Marcos State University
MRL	Maximum Residue Levels
MSU	Mindanao State University
NaRDSAF	National Research and Development System for Agriculture and Fisheries
NCCAG	National Color-Coded Guide
NFRDI	National Fisheries Research and Development Institute
NGO	Non-Government Organization
NOAB	National Organic Agriculture Board
NOAC	National Organic Agriculture Congress
NOMIARC	Northern Mindanao Integrated Agricultural Research Center
NMACLRC	Northern Mindanao Agricultural Crops and Livestock Research Complex
NSAP	National Stock Assessment Program
NTF	Agriculture and Fisheries Technology Forum and Product Exhibition
NVSU	Nueva Vizcaya State University
OA	Organic Agriculture
OPA	Office of the Provincial Agriculturist
OPV	open pollinated variety
PAO	Provincial Agriculture Office
PCA	Philippine Coconut Authority
PCARI	Philippine-California Advanced Research Institutes
PCA-ZRC	Philippine Coconut Authority-Zamboanga Research Center
PCC	Philippine Carabao Center
PhilFIDA	Philippine Fiber Development Authority
PhilGEPS	Philippine Government Electronic Procurement System
PhilMech	Philippine Center for Postharvest Development and Mechanization
PhilRice	Philippine Rice Research Institute
PhilRootcrops	Philippine Root Crops Research and Training Center
PHTRC	Postharvest Horticulture Training and Research Center
PNAD	Philippine Native Animal Development
PNRI	Philippine Nuclear Research Institute

PRDP	Philippine Rural Development Plan
R&D	Research and Development
RDE	Research and Development and Extension
RDEAP	Research Development and Extension Agenda Programs
RSP	Red Spanish Pineapple
PCIP	Provincial Commodity Investment Plan
PRA	Participatory Rural Appraisal
PSAU	Pampanga State Agricultural University
QARES	Quezon Agricultural Research and Experiment Station
RCM	Rice Crop Manager
RFO	Regional Field Office
RIC	Rural Improvement Club
RMTU	Ramon Magsaysay Technological University
RO	Regional Office
RSP	Red Spanish Pineapple
SAAD	Special Area for Agricultural Development
SCoPSA	Sustainable Corn Production in Sloping Areas
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SLSU-JGE	Southern Luzon State University-Judge Guillermo Eleazar
SPG	Scientific Publication Grant
SUC	State Universities and Colleges
SWCCO	Systems Wide Climate Change Office
TAU	Tarlac Agricultural University
TCD	Technology Commercialization Division
TCoW	Technology Commercialization on Wheels
TWG	Technical Working Group
UPLB	University of the Philippines Los Baños
UPLB FI	University of the Philippines Los Baños Foundation,W Incorporated
UPPAF	University of the Philippines Public Administration and Extension Services Foundation
USAID	United States Agency for International Development
USM	University of Southern Mindanao
VSU	Visayas State University
ZAMPIARC	Zamboanga Peninsula Integrated Agricultural Research Center

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